

THE
UNIVERSAL GARDENER
AND
BOTANIST:

OR,
A GENERAL DICTIONARY
OF
GARDENING AND BOTANY.

Exhibiting in Botanical Arrangement, according to the Linnæan System,

The various Genera and Species of Plants, Trees, Shrubs, Flowers, and Fruits, that merit Culture for Use, Ornament and Variety, in the different Departments of Gardening, Plantations, Shrubberies, Nursery, Green-house, Hot-house or Stove, Forcing-house, Hot-walls, and Hot-beds: describing the Botanic Classes, Orders, and Characters of the Genera, with General and Specific Descriptions of the Species of each Genus; their respective and general Uses, different Methods of Propagation, and General Culture, in their several Departments.

Comprising accurate Directions, according to real Practice, for the Management of the

KITCHEN-GARDEN,	NURSERY,	HOT-BEDS,
FRUIT-GARDEN,	PLANTATIONS,	FORCING-FRAMES,
PLEASURE-GROUND,	GREEN-HOUSE,	HOT-WALLS, and
FLOWER-GARDEN,	HOT-HOUSE, or STOVE,	FORCING in general.

Describing the General Plans and Formation of the several Gardening Districts and Departments, as above; with distinct Arrangements, and general Descriptions of the various tribes of Plants, Trees, Flowers, and Fruits, adapted to each different Department; and Explanations of the proper Situations, Exposures, Soils, Manures, Composts, various Garden Materials, and principal Utensils; together with full Directions for performing all the Practical Operations of Gardening in general, both in the various Methods of Propagation and Culture of the numerous Plants, and in the Management of every Garden District, and the various relative Plantations.

By THOMAS MAWE,
And JOHN ABERCROMBIE, ✕
Author of Every Man his Own Gardener, &c.

THE SECOND EDITION.

Carefully revised, corrected, and very much enlarged and improved; with the Addition of many considerable and important Articles of Practical Gardening, and the Arrangement and Description of above Five Hundred Species of Plants more than in the former Edition.

And in this Edition are added many Descriptive Plates of Green-houses, Hot-houses or Stoves, Forcing-houses, Hot-walls, and Bark-pits, &c. with Plates describing Botanically the different Parts of Plants, Flowers, Fruits and Seeds: and the Botanic Classes and Orders, constituting the Linnæan Sexual System of Plants.

L O N D O N,
PRINTED FOR G. G. AND J. ROBINSON, PATER-NOSTER ROW;
AND T. CADELL JUN. AND W. DAVIES, STRAND.

1797.

TO THE
GARDENERS, BOTANISTS, AND FLORISTS,
OF
GREAT BRITAIN AND IRELAND,
THE FOLLOWING WORK,
THE RESULT OF MANY YEARS' LABOUR
AND EXPERIENCE
IN VARIOUS PARTS OF THESE KINGDOMS,
IS HUMBLY INSCRIBED,
BY THEIR MUCH OBLIGED
AND OBEDIENT SERVANTS,

THE AUTHORS.

INTRODUCTORY OBSERVATIONS.

IN the following Work, it may be proper to intimate, that, with respect to the arrangement of the matter, both of the numerous different Genera and Species of Plants, &c. and of the Various Descriptive Articles and Practical Operations in the general System of Gardening, and the Botanic Terms and Explanations of the different parts of Plants, and systematic Principles of Botany, the whole is disposed in one general arrangement, according as the names of the said Genera, articles of Gardening, and Botanic Terms, respectively occur in their alphabetic order.

All the species of plants, &c. being arranged systematically in many different genera or families, according to their general Botanic Characters, the different kindred species are distributed accordingly into relative genera, some genera comprising but one or two, and others many different species : and all of which genera and their respective species, are arranged in the order as above, under their generical botanic names, followed immediately by that of the class and order in which they associate in the Botanic System, and by the general descriptive characters of each genus and its relative species : as all the species of every genus possess invariably the same generic distinction ; and each associated species of the said genera is arranged therein under the same generical name, preceding and annexed to that of its trivial or common name ; and under each species are assembled its respective varieties, where any occur, whe-
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ther consisting of any accidental variation in their general growth, or in the leaves, flowers, or fruits, &c. the two latter of which, in particular, are in many species exceedingly various and numerous.

Likewise in the aforesaid general arrangement, are distinct selections or separate arrangements of many different genera, species, and varieties of plants, trees, flowers, fruits, &c. in each; collected from the general body of the Work, into tribes, under different heads, according to their general habit and nature of growth, different temperatures, and particular uses in the several garden departments; consisting of the tribes of Annual Plants, Biennial and Perennial Plants, Bulbous, Fibrous, and Tuberous-rooted Plants, Kitchen-garden Plants, Aromatic Plants, Salad-herbs, Soup-herbs, Succulent Plants, Medical Plants, Green-house Plants, Hot-house or Stove Plants, Forcing-house Plants and Trees, principal Hot-bed Plants, Edging Plants for Edgings, Climbing Plants, Herbaceous Plants, and different Tribes of Trees, comprising Deciduous Trees and Shrubs, Evergreen Trees, Fruit Trees, Forest Trees, Orchard Trees, Hedge Trees for Hedges, Espalier Trees, Wall Trees; and various other Tribes of Plants and Flowers, &c. arranged under separate heads; with general descriptions of the Plants and Trees, &c. of each Tribe, and intimations of their utility in the respective departments of Gardening, and general Management; referring to the various respective Genera as they occur in the general arrangement in the different parts of the Book, for particulars of the different Species, &c. belonging to each Genus.

Also in the same general arrangement are comprised, Descriptions of the different Garden Departments and Erections, and of the various articles in the general System of Practical Gardening, under many distinct

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heads ; comprehending descriptive explanations of the Kitchen and Fruit-garden, Pleasure-ground, Flower-garden, Plantations and Shrubberies, Lawns, Walks, Water, Grass-compartments, Gravel and Terrace Walks, Orchards, Nursery, Hedges, Walls, Wall-trees, Espaliers, &c. and of various other relative compartments ; also of Green-houses, Hot-houses or Stoves, Forcing-houses, Hot-walls, Bark-pits, Hot-bed-frames, Drawing-frames, Glass-cases, Hand-glasses, and Hot-beds in general ; with general intimations of the principal utility, formation, and practical management of each of the said departments, &c. under their respective heads ; the proper Soils, Situations, Exposures, Manures, Dungs, Composts, &c. describing likewise in a similar manner, under their respective articles, the various Garden Materials, principal Utensils, Implements, and other necessary Requisites ; with Explanations of the different Practical Methods of Sowing, Planting, Propagating, Pruning, and all other principal operations in the process of general Gardening ; both in the culture of the various Plants, Trees, Shrubs, Flowers, Fruits, &c. and in the proper management of every garden district and relative article.

And likewise in the general arrangement are comprised, the principal Botanic Terms and Descriptions of the different parts of Plants, &c. comprehending the different sorts of Roots, Stems, Leaves, Flowers, and modes of Flowering, Fruits, Seed-vessels, and Seeds, with Explanations of the different Sexes, Classes and Orders, Characters, Genera, Species, and Varieties ; the whole displaying the essential principles of the Botanic System, conformably to the Linnæan Sexual Method ; and as, agreeably to that universally adopted system, all vegetables, as well as animals, having a distinction of Sexes, and which being contained in the flowers only of the respective plants, the whole vegetable creation is there-

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thereupon divided into twenty-four grand divisions or primary Classes, according to the differences of the said Sexes or Fructifications of the flowers, in male, female and hermaphrodite ; and by the same rule, the Classes are subdivided into Orders, the Orders into Genera, the Genera into Species, and these into Varieties, according as any occur ; all of which are fully explained under their respective heads, in the course of the following Work.

And in this second edition are added numerous important articles of practical gardening, and several hundred species of plants not in the former edition ; with many considerable plates, describing the general plans of green-houses, stoves, and forcing-houses, &c. and the descriptions of the different parts of plants, flowers, and fruits ; and the classes and orders of the genera, forming the Botanic Sexual System.

On the whole, our attention in the process of this work has been to explain thoroughly the whole system of general gardening, and the essential principles of botany, in its horticultural utility ; the general system of plants, &c. proper for every garden district and department ; not either in the manner of a voluminous Herbal, or that of a general history and description of all sorts of plants, useful and useless, for garden culture ; nor proceeding in the extreme minutiae of botanic description ; but describing, in a general manner, all the valuable principal Genera, Species, and Varieties of plants, &c. estimable for use, ornament, variety, and curiosity, both of all the hardy kinds for the full ground, and tender exotics for the green-house and stove, &c.

T H E
UNIVERSAL GARDENER

A N D

BOTANIST.

A B R

ABROMA, comprises an exotic tree of the East Indies, retained in some eminent stoves, garnished with heart-shaped or angular leaves and polyadelphious flowers.

Class and order, *Polyadelphia Pentandria*.

Characters.] CALYX, three acute spear-shaped spreading leaves. COROLLA, five petals larger than the cup; with claws, oval, arched, concave, and erect; and the border oval, obtuse, spreading, ciliate, and contracted at the base into short recurved claws, on which the principal claws are placed, with a short, small, pitcher-shaped nectarium. STAMINA, five polyadelphious, membranaceous small filaments, each topped with three twin antheræ, of a kidney-shape. PISTILLUM, a cylindric germen, with five subulate approximating styles, crowned with acute stigmas. PERICARPIUM, an ovate, membranaceous, veined capsule, with five wings, and five cells opening at top, containing many subovate seeds.

The species are,

ABROMA angusta.

Maple-leaved Abroma.] Grows a tree, with a strait trunk and branches, garnished with ovate-spear-shaped, acuminate leaves; and others angular, with five or seven lobes, veined, and placed alternate; the flowers are of a dark purple, and come out on the ends of bifid foot-stalks, nodding downwards; appearing in July and August.

This plant is a native of New South-Wales and the Philippine Islands, and, when cut, yields a kind of gum. There is another species of this genus, a shrub with the extreme branches woolly, but has not been yet introduced into England. The propagation of the first sort

is by cuttings in the spring, planted in pots, and plunged in a hot-bed, and when rooted, transplanted into single pots and plunged into the bark-bed in the stove, where they must constantly be kept.

ABRUS, Wild Liquorice, a perennial, shrubby, climbing plant, for the stove, garnished with winged leaves and butterfly-shaped flowers.

Class and order, *Diadelphia Decandria*.

Characters.] CALYX, monophyllous, four-lobed and bell-shaped. COROLLA, papilionaceous, having a roundish entire vexillum, oblong blunt wings, and oblong sickle-shaped gibbous keel longer than the wings. STAMINA, ten diadelphious filaments in a sheath, and oblong erect antheræ. PISTILLUM, a cylindric hairy germen, and awl-shaped style, crowned with a small head-formed stigma. PERICARPIUM, a rhombus-like compressed leathery pod, bivalved and acuminate, having four or five cells, each containing a single subglobose seed.

There is but one species, viz.

ABRUS precatorius.

Jamaica Wild Liquorice.] Hath slender, shrubby, twining, and branching stalks, climbing on support eight or ten feet high, garnished with pinnate leaves, having sixteen pair of oblong blunt folioles, abruptly terminating. The flowers are of a pale purple, and come out in short spikes or bunches from the sides of the stalks, and are succeeded by short pods containing in each three or four hard seeds of a bright scarlet colour, with a black spot where it is fastened to the pod.

The propagation of this plant is by seeds sown on a hot-bed in the spring, previously
B soaked

soaked three or four days in water, and when the plants are come up two inches high, should each be transplanted into a separate pot in light earth, and plunged in the bark-bed in the stove; observing to keep them shaded till they have taken fresh root, where they must be constantly kept; and the second year they will flower and ripen their seeds.

ACANTHUS, formerly named *Branca Urfina*, i. e. Bear's-breech.

This genus retains five distinct species, four of which are hardy herbaceous perennials of the flowery tribe, that obtain three or four feet stature, adorned at top with numerous flowers in erect spikes, and merit esteem as plants of ornament for the embellishment of the pleasure ground. The other is an evergreen shrub, of the temperature of stove exotics.

The *Acanthus* belongs to the class and order *Didynamia Angiospermia*, and its characters are,

The **CALYX**, three pair of leaves forming a kind of triple cup. The **COROLLA**, monopetalous, unequal and ringent, opening above with a mouth, hath a broad under lip, but the upper one is wanting. The **STAMINA** are two short and two long filaments, having compressed antheræ. The **PISTILLUM**, a turbinate germen supporting a filiform style, terminated by two acute stigmas. **PERICARPIUM**, a roundish capsule of two cells, pregnant with smooth fleshy seeds.

The species most common are,

1. **ACANTHUS mollis.**

Smooth Acanthus.] *Acanthus* with deeply sinuated and indented, smooth, unarmed leaves.

Variety.] *Acanthus mollis lucidus.* Shining-leaved smooth acanthus, with larger less-sinuated smooth leaves, the upper side shining.

2. **ACANTHUS spinosus.**

Thorny Acanthus.] *Acanthus* with deeply jagged many-pointed leaves, having each segment terminated by a thorny point.

3. **ACANTHUS Dioscoridis.**

Acanthus of Dioscorides.] *Acanthus* with spear-shaped entire leaves, having spinous borders.

4. **ACANTHUS ilicifolius.**

Holly-leaved shrubby Acanthus.] *Acanthus* with a shrubby stalk, and waved, dentated, spinous-edged leaves.

The first four species are hardy, herbaceous, fibrous-rooted plants, that produce stalks annually, three or four feet high, perennial in root, but annual in leaf and stalk, they rising in spring, and perish in autumn.

The roots are composed of thick fleshy fibres, which are considerably spreading, and penetrate deep in the earth.

The leaves and flower-stalks rise immediately from the root. The leaves spread near the ground; they are large and long, generally from about ten or twelve to eighteen inches in length, and half as much in breadth. Those of the first, second, and third sorts, are variously sinuated, divided, and indented, and spreading in circular clusters, and form a singularly elegant appearance. The flower-stalk rises between the leaves, and attains three or four feet stature, erect, round, thick, fleshy, and decorated upward with numerous flowers, which are universally hermaphrodite, and formed each of one tubular petal, the colour chiefly white, and arrange themselves in a thick spike along the upper part of the stalk, each separate flower occupying a distinct cup. They appear in July and August, continue a month or six weeks, and are succeeded by plenty of ripe seed in autumn.

The *Acanthus mollis* was greatly celebrated in ancient times for the elegance of its leaf, which attaining a considerable length and breadth, and having its edges curiously scalloped, undulated, and indented in a singularly beautiful manner, is the chief ornament of the plant.

The *Acanthus spinosus* is also a noble plant, and demands our attention for the singularity of its large many-pointed thorny leaves, which form a pleasing variety.

The above two species are the most commonly known and cultivated in the English gardens.

These plants are natives of Italy, Spain, and Portugal, but grow freely here in the full ground, and are of easy culture.

The *Acanthus ilicifolius* is a low evergreen shrub, a native of South America, and requires the aid of a stove to retain it in this country.

Use in Gardens, Propagation, &c.

With respect to the merit of these plants in gardens, the herbaceous species may with propriety be employed as furniture for the decoration of common large borders, and other similar compartments of the pleasure ground, and they may be introduced in the shrubbery clumps, toward the front, between shrubs of moderate growth. Their flowers, though not elegant, are conspicuous; which, together with the pleasing singularity of the leaves, the plants will effect the purpose both of variety and ornament.

They prosper in any common soil, and do not require any particular exposure.

The four herbaceous species may be propagated both by seed and by parting the roots.

The seed grows freely in the common ground,

ground, and should be sown in March or April, either in shallow drills, or on the surface, and raked in, or covered with earth half an inch deep. The plants will appear in six weeks: thin them to six inches, or, when two or three inches high, prick them out at that distance: and in autumn or spring following transplant them into the borders, where they will flower the succeeding summer.

The propagation by parting the roots may be effected in autumn or spring: the smallest off-set will readily grow; it, however, is not eligible to part them too small. See PARTING ROOTS. Plant them at once where they are to continue.

Their general culture is only to allow support, when necessary, to the flower-stalks, and when these decay in autumn, to cut them down.

These plants are retained in most of the nurseries for sale, particularly the Smooth and Thorny Acanthus.

The holly-leaved *Acanthus*, being a most tender exotic shrub, is retained here in hot-houses, to diversify the collection of curious foreign plants of similar temperament, residents of that department—is propagated by seed when attainable from abroad, or may be tried by cuttings, layers, &c. sowing or planting in pots, and plunged in the bark-bed in the stove till raised, and afterwards treated as the other hot-house exotics.

ACAULES *Plants*, i. e. without a caulis, or stem. A term used by botanists, expressive of plants that have no visible stalk, but grow close to the ground.

ACER. The Maple Tree.

This genus furnishes a large collection of hardy deciduous trees, being such as cast their leaves in autumn, and remain divested of them during the winter; they claim attention, some as timber trees, others for useful and ornamental purposes in gardening.

Class and order, *Polygamia Monœcia*.

Characters.] Hermaphrodite and male flowers a-part on the same plant.

CALYX, monophyllous, five-parted, coloured, and permanent. COROLLA, five ovate expanded petals. STAMINA, eight filaments with simple antheræ. PISTILLUM, a compressed germen, and slender style, having two acuminate stigmas. PERICARPIUM, two roundish, united, winged capsules, each containing one seed.

The species and respective varieties are,

1. ACER *campestre*.

Common or Smaller Maple.] Maple with small lobated and obtusely emarginated leaves, divided into three principal lobes.

2. ACER *Pseudo-platanus*.

Greater Maple, or Sycamore-Tree.] Maple with larger leaves divided into five lobes, having the edges unequally serrated, and flowers produced in a racemus.

Variety.] Sycamore-tree with variegated leaves.

3. ACER *rubrum*.

Scarlet flowering Maple.] Maple with leaves divided into five slightly indented lobes, white on the under side, and with aggregate flowers.

Varieties.] Virginia scarlet flowering maple. —Sir Charles Wager's flowering maple, with the largest aggregate of flowers.

4. ACER *saccharinum*.

Sugar Maple.] Maple with five-parted palmated leaves, having the edges sharply indented.

5. ACER *platanoides*.

Plane-tree-like, Norway Maple.] Maple with smooth shining leaves, divided into five sharp-pointed and acutely indented lobes, and flowers produced in a corymbus.

Variety.] Norway maple with variegated leaves. —Norway maple with cut leaves.

6. ACER *pennsylvanicum*.

Pennsylvanian Mountain Maple.] Maple with leaves, having three acuminate and sharply serrated lobes, and flowers produced in a racemus.

7. ACER *Negundo*.

Ash-leaved Virginia Maple.] Maple with leaves composed of several distinct lobes, and with flowers produced in a racemus.

8. ACER *monspessulanum*.

Montpellier or French Maple.] Maple with shining leaves, having three lobes with entire edges.

9. ACER *montanum*.

Mountain Maple.] Maple with leaves divided into four or five lobes, having the edges acutely serrated, and flowers produced in a compound racemus.

10. ACER *Opalus*.

The Opalus or Italian Maple.] Maple with large roundish lobated, slightly cut leaves, and flowers produced in a racemus.

11. ACER *tataricum*.

Tartarian Maple.] Maple with oblong heart-shaped, slightly lobated, and unequally serrated leaves.

12. ACER *creticum*.

Cretan or Levant Maple.] Maple with leaves divided into three lobes, having the edges entire, and the under side a little downy.

Variety.] ACER *sempervirens*.

Evergreen Cretan Maple.] With leaves ovate entire.

All the above species and respective varieties are of the tree kind, deciduous, except the

last sort, and of hardy temperature, that prosper in almost any soil and exposure, in common with other hardy deciduous trees.

Most of the species, except the *Acer campestre* and *Pseudo-platanus*, are natives originally of distant climates, some of America, and others of different parts of the continent of Europe, and the countries annexed to their names; but most of the sorts are now cultivated in the English nurseries, for the supply of noblemen and gentlemen's plantations.

These trees are of stature from about twenty to forty feet or upward; the Greater Maple frequently exceeds that height, and the Norway, Ash-leaved, Sugar, and Italian Maple, are likely to attain that height at least in this country; but the other species rarely obtain more than twenty or thirty feet stature. Most of the species branch out irregularly at first, but in time form pretty full and regular heads, ornamented chiefly with opposite leaves. The leaves are universally simple, except the *Acer Negundo*, and are from about three to six or eight inches broad, and generally divided into three or five lobes, some but slightly, others deeply divided; and some have the edges of the lobes entire, others indented, and some are serrated or sawed, by which distinction the different species may with facility be detected. The flowers are separately small, but numerous together, arising chiefly from the sides of the young branches, and are produced in a racemus, and some in a corymbus, &c. which in the greater part are of a yellowish green colour; and some are of a bright yellow, others red, very ornamental, such as in the *Acer platanoides* and *rubrum*; appearing, in all the sorts, principally in spring and early in summer, and are succeeded by ripe seed the beginning of autumn.

Most of the sorts ripen seed perfectly in England, which is remarkably free of growth, as is evident by that which scatters promiscuously from the trees, from which many young plants often rise naturally, particularly the Common and Greater Maples.

The *Common Maple* grows wild in woods and hedges. This tree attains but a moderate stature, and its foliage is small; it is sometimes admitted, for variety, in extensive plantations.

The *Greater Maple* is a stately tree, of free growth, decorated with luxuriant foliage, that affords a delightful shade; and both the plain and variegated sort effect an agreeable diversity in ornamental plantations.

The *Acer rubrum* is a tree of moderate growth, the leaves are large, and the flowers have great beauty, particularly those of the second variety, i. e. Sir Charles Wager's

Flowering Maple, which arise in numerous large clustering heads, and are extremely conspicuous and ornamental.

The *Acer saccharinum*, *platanoides*, and *Ash-leaved Maples*, are all three large growing trees, and are proper to be employed in outward plantations; as their leaves are of different sizes and shapes, and of lighter and darker shades, they afford a pleasing variety: if some trees are dispersed in parks and other extensive places, they will diversify the general scene; the corymbus flowers of the *Acer platanoides* have singular beauty; and the sort with variegated leaves forms a pretty diversity.

The first of the above three trees, i. e. *Sugar Maple*, obtained the name from the circumstance of its imparting a great quantity of sweet juice, with which a tolerable good sugar is prepared. This juice is obtained by piercing or tapping the trees, and from which parts the juice continues to issue for several days. This is greatly practised in America, where the trees are large and numerous. The property of the sweet juice is not, however, limited to this particular species; for even the Greater Maple, and some other large kinds, are found to emit great quantities, little inferior to that of the species under consideration.

The *Pennsylvanian*, *Montpelier*, and *Mountain Maples* are trees of moderate growth, and the leaves are of a middle size; those of the latter are of a thick consistence, have a shining surface, and continue late in autumn, which renders them of esteem for ornamental purposes.

The *Acer Opalus* is a noble tree; it acquires a considerable stature, hath a spreading head, adorned with large and beautiful foliage.

The *Cretan* and *Tartarian Maple* are trees of humble stature, and are very proper for interior plantations.

Uses in Gardening, Propagation, &c.

For purposes in gardening, most of the species are proper to be employed in ornamental plantations and parks, and other extensive departments, in assemblage with other hardy deciduous trees of similar growth; in forming detached clumps, groves, thickets, avenues, shade for spacious walks and rural seats; and in forming running or continued plantations on the boundaries of extensive lawns, parks, &c.

All the sorts may be propagated with great facility by seed, and most of them may likewise be increased by layers and cuttings; but the seedling-raised plants generally sooner make the handsomest trees, advancing faster in a straight free growth, and is the most eligible for the general propagation; and the other

other methods occasionally to particular species and varieties.

The seed grows freely in the common ground, and the time of year for sowing it is autumn, soon after it is ripe, or early in spring; but the former is generally the most successful season, as that of the spring sowing is apt to rise straggling. Choose a light mellow spot of ground; and after being dug, divide it into one or more beds, three or four feet wide; smooth the surface, and sow the seeds thereon, and cover them a little more than half an inch deep. The plants will appear in April or May, and by Michaelmas they will be eight or ten inches high; when, or in the ensuing spring, some of the largest may be transplanted, and in autumn following the whole; planting them in the nursery in rows two feet and half distance.

They should be permitted to have at least four or five years growth in the above nursery, or till they have attained five or six feet stature, when they may be employed in plantations.

The propagation by layers and cuttings may be performed in autumn; choose the shoots of the young branches, and in one year they will be well rooted. See **LAYERS** and **CUTTINGS**.

The variegated kinds are increased either by layers, cuttings, or inoculation, though sometimes the sycamore comes variegated from the seed of the same kind; but the most certain means of obtaining them is by the above methods, when every plant so raised will have the same variegations as the parent tree.

All the varieties of these trees are propagated for sale in most of the nursery gardens.

ACETOSA, Sorrel. See **RUMEX**.

ACHANIA. This genus furnishes the stove with a shrubby exotic, adorned with largish, lobate, simple leaves, and mallow-shaped flowers.

Class and order, *Monadelphia Polyandria*.

Characters.] **CALYX**, double, the exterior consists of many narrow leaves, and the interior of one. **COROLLA**, five convolute heart-shaped petals. **STAMINA**, numerous filaments joined at their base, and forming a column which is topped with kidney-shaped antheræ. **PISTILLUM**, a roundish germen, and slender style, crowned with a capitated stigma. **PERICARPIUM**, a round fleshy berry, containing five seeds.

The species for our purpose, and of most note, is,

ACHANIA Malvaviscus.

Malvaceous scarlet Achania.] Hath a shrubby stalk, branching ten or twelve feet high: the

leaves are heart-shaped angular and acuminate; from the wings of the stalks come out scarlet flowers with the petals contorted, which are succeeded by round scarlet berries of a clammy nature.

As this species is too tender for the open air in this climate, the plants must be constantly kept in the stove in pots of rich earth, and the same attention given them as to plants of the like nature.

Propagation.] By seed sown in the spring months on a hot-bed; sow it in pots about half an inch deep in good rich mould, and plunge the pots to the rim; when the plants are risen to two or three inches high, they may be pricked into separate pots, watered and replunged; also plants may be raised by cuttings or the young shoots in pots, and plunged in the bark-bed or other hot-bed.

ACHILLEA, Milfoil or Yarrow, and Sneezwort.

The plants of this genus are herbaceous, fibrous-rooted perennials, of hardy growth, cultivated for ornament, variety, and medical purposes; growing from about six inches to two or three feet high: with pinnate, bipinnate and simple leaves, in the different species, and the stalks terminated by umbels, or corymbus bunches of small compound flowers.

Class and order, *Syngenesia Polygamia Superflua*.

Characters.] The **FLOWER** is compound and radiated. **CALYX**, the common cup is oval and imbricated. **COROLLA**, several tubular hermaphrodite florets compose the disk, and five to ten flat female florets the radius. **STAMINA**, five capillary filaments in each hermaphrodite floret. **PISTILLUM**, a small germen, slender style, and obtuse stigma. **PERICARPIUM** none, the seeds being lodged in the calyx.

There are above forty species:—those that demand attention are,

1. **ACHILLEA Millefolium**.

Common Milfoil or Yarrow.] Achillea with doubly pinnated leaves, the lobes cut into many narrow segments and white umbels.

Variety.] Common Milfoil with purple umbels.

2. **ACHILLEA Ptarmica**.

Common Ptarmica, or Sneezwort.] Achillea with spear-shaped pointed leaves, having the edges sharply serrated, and white umbels.

Variety.] Ptarmica with double flowers.

3. **ACHILLEA Ageratum**.

Sweet Maudlin] Achillea with spear-shaped obtuse leaves, with the edges acutely sawed, and yellow umbels.

Variety.] Long corymbus-flowered sweet Maudlin.

4. **ACHILLEA**

4. *ACHILLEA tomentosa*.

Hoary, bright yellow Milfoil.] Achillea with pinnated, rough, hoary leaves; the lobes very narrow and indented, and bright yellow umbels.

5. *ACHILLEA Clavennæ*.

Pinnatifid silvery Milfoil.] Achillea with pinnatifid, plane, obtuse, hoary silvery leaves, and flat white umbels.

6. *ACHILLEA nana*.

Dwarf hoary Alpine Milfoil.] Achillea with pinnated and indented downy leaves, and globular white umbels.

7. *ACHILLEA ægyptiaca*.

Egyptian hoary Sneezwort.] Achillea with pinnated hoary leaves, the lobes obtusely spear-shaped, fawed and indented, and yellow umbels.

8. *ACHILLEA abrotanifolia*.

Southernwood-leaved Milfoil.] Achillea with pinnated, supra-decompound, hoary leaves; the segments very narrow, and stand remote, and yellow umbels.

9. *ACHILLEA macrophylla*.

Long fever-few-leaved Sneezwort.] Achillea with pinnated, deeply serrated, plane leaves; the outermost wings the largest, and loose white umbels.

10. *ACHILLEA pubescens*.

Downy Tansey-leaved Sneezwort.] Achillea with pinnated downy hoary leaves, the lobes spear-shaped, deeply cut and serrated, and pale yellow umbels.

11. *ACHILLEA nobilis*.

Noble or Sweet Milfoil.] Achillea with doubly pinnated, finely divided, sweet-scented leaves, the lower ones plane and naked, the upper obtuse and downy, and a convex white umbel.

Variety.] Noble Milfoil with pale red umbels.

12. *ACHILLEA Santolina*.

Lavender-cotton-leaved Eastern Sneezwort.] Achillea with indented bristly hoary leaves, the denticles almost entire, awl-shaped and reflexed, and large yellow umbels.

Of the above species, the *Purple Milfoil*, *Double Ptarmica*, and *Achillea tomentosa*, *Clavennæ*, *nana*, *ægyptiaca*, *abrotanifolia*, and *macrophylla*, are the most commonly known and cultivated as flowering and ornamental garden plants, though most of the other sorts may also be admitted for the same occasion to encrease the variety.

All the species are hardy herbaceous perennials, that prosper in any common soil.

The roots are fibrous, which in many species creep in a horizontal direction, and multiply exceedingly.

The leaves and flower-stalks rise from the

root annually. The stalks attain different heights, from half a foot to a yard or upward, in the different species, decorated with leaves, and terminated by the umbels of flowers. The leaves in some are simple, but in the greater part winged or pinnated; and divided into a multitude of minute segments, in the manner of tansey, wormwood, chamomile, &c. which in most species possess different degrees of hoariness, and have an ornamental effect in a garden.

The flowers singly are small, but numerous, many being produced together from the summit of the stalks, in a sort of umbel or rather corymbus, appearing in June, July, August, and September, and are succeeded by ripe seed in autumn.

The two first species grow naturally in England; all the others are originally from distant parts, as the Alps, France, Spain, Italy, and the Archipelago, &c.

The *Achillea Millefolium* and *Ptarmica* attain two or three feet stature. The common species grow wild in pastures, woods, and sides of banks. They are esteemed for medicinal uses; and the two varieties, *Purple Milfoil* and *Double Sneezwort*, are admitted in gardens as ornamental plants. The roots of the *Common Sneezwort* are remarkable for provoking sneezing; and being acrid, a bit chewed in the mouth, often procures a temporary respite in the tooth-ach.

The *Sweet Maudlin* rises two feet high: the leaves impart a fragrant odour. The common species is cultivated for medicine, and the variety is retained as a flowering plant.

The *Achillea tomentosa*, *Clavennæ*, *nana*, and *ægyptiaca*, are of humble growth, seldom attaining more than from six to twelve inches height, have very hoary leaves, and adorned with moderately large, compact, and very ornamental umbels.

The other five species grow from eighteen inches to a yard high, the leaves chiefly hoary, and the umbels large.

Use in Gardens, Propagation, &c.

For purposes in gardens, the singularity of the hoary leaves of many sorts forms a pretty variety, and the flowers being conspicuous, and continuing two or three months, render the plants proper furniture for common borders, and the fronts of shrubbery compartments.

All the sorts may be readily propagated by parting the roots any time in autumn or spring, and some also by slips and cuttings of the stalks, &c. in a shady border in summer.

Many of the sorts furnish plenty of seed, by

by which they may likewise be raised by sowing them in March or April, in a bed of light earth; and the plants will be fit to transplant for good at Michaelmas, and will flower the following summer.

ACHRAS, Sapota-Tree, or Mammee Sapota.

This genus retains but two species, which are of the tree-kind, natives of the warm parts of America; their merit here is merely for variety, and require the constant aid of a stove.

Class and order, *Hexandria Monogynia*.

Characters.] **CALYX**, six acute permanent leaves. **COROLLA**, five heart-shaped petals joined at the base. **STAMINA**, six short filaments, having arrow-pointed antheræ. **PISTILLUM**, an oval germen, a short style, and blunt stigma. **PERICARPIUM** is of the apple-kind, containing one or two oval hard nuts.

The species are,

1. **ACHRAS Sapota.**

Common Sapota-Tree.] Achras with oblong ovate leaves, and smooth top-shaped fruit.

2. **ACHRAS Mamosa.**

The Mammee Sapota of the West Indies.] Achras with spear-shaped leaves, large oval fruit, both ends terminating in a sharp point.

These trees in America rise thirty feet high, but those cultivated here in our stoves appear as shrubs; the leaves are large; those of the second sort approach near a foot in length; the flowers are of a cream colour, and are succeeded by a kind of apple, consisting of a thick succulent pulp, of a luscious taste.

Both the species are propagated here by seed, i. e. the nuts or stones included in the fruit, which must be procured from the West Indies, and as soon as they arrive, planted in pots, and plunged in a hot-bed under frame and glass, or in the bark-bed in the stove.

Their culture is the same as other woody exotics, of similar temperature. See **STOVE PLANTS**.

ACHYRANTHES.

The plants are chiefly herbaceous, and somewhat shrubby perennials, exotics, of the temperature of green-house and stove plants, retained more for variety than beauty.

Class and order, *Pentandria Monogynia*.

Character.] **CALYX**, five acute stiff permanent leaves. **COROLLA**, none. **STAMINA**, five filaments with small antheræ. **PISTILLUM**, a single style having a bifid stigma. **PERICARPIUM** none; one roundish seed lodged in the calyx.

There are eight or nine species, but, possessing little merit; not more than one sort is commonly known among gardeners, which is,

ACHYRANTHES aspera.

Rough Sicilian and American Achyranthes.] Achyranthes with erect stalk, oblong pointed leaves, and adpressed spikes of flowers, having reflexed cups.

The plant rises a yard high, decorated with oblong leaves, and long spikes of apetalous flowers, which proceed from the ends of the branches, appearing in July and August, and ripen seeds in September.

This plant should be potted and kept in the stove, or a good green-house, in winter.

The propagation of this plant may be effected by seed and by cuttings, assisted by a hot-bed.

The following are some of the other species of less note.

1. **ACHYRANTHES lanata.**] Woolly cupped African Achyranthes, with whorled spikes.

2. **ACHYRANTHES indica.**] Indian Achyranthes, with oval waved leaves and reflexed flowers.

3. **ACHYRANTHES lappacea.**] Burry-flowered shrubby Achyranthes.

4. **ACHYRANTHES muricata.**] Prickly-cupped shrubby Achyranthes, with alternate leaves.

These are chiefly of the tribe and temperature of the common species.

ACONITUM, Aconite, Monk's-hood, or Wolf's-bane.

This genus furnishes several species of hardy herbaceous perennials, esteemed as ornamental garden plants, attaining in stature from two to six feet, their stems terminated by elegant spikes of flowers.

Most of the plants of this genus possess a poisonous quality.

Class and order, *Polyandria Trigynia*.

Characters.] **CALYX**, none. **COROLLA**, composed of five irregular petals, one placed above, one below, and two sideways, the upper one the helmet, formed like a hood, and covering the other parts; and in the bottom are two nectariums. **STAMINA**, numerous filaments, having erect antheræ. **PISTILLUM**, three or five germina, as many styles, surmounted each by a reflexed stigma. **PERICARPIUM**, three or five oblong capsules, of one cell, filled with angular seeds.

The species of most note are,

1. **ACONITUM pyramidale.**

Common Pyramidal blue Aconite.] Aconite with leaves divided into many narrow segments, and very long pyramidal spikes of blue sessile flowers.

2. **ACONITUM lycoctonum.**

Poisonous yellow Aconite.] Aconite with palmated,

mated, finely divided, hairy leaves, and yellow spikes of flowers.

Variety.] Large poisonous yellow Aconite, with palmated smooth leaves.

3. *ACONITUM Anthora.*

Wholesome yellow Aconite.] Aconite with leaves divided into many long narrow segments, and sulphur-coloured spikes of flowers.

4. *ACONITUM Napellus.*

Napellus, or large blue Aconite.] Aconite with leaves cut into many linear segments, the upper ones broadest and marked with a line, and large blue flowers.

Varieties.] Rose-coloured Napellus.—White-flowered Napellus.—Variegated blue and white Napellus.

5. *ACONITUM pyrenaicum.*

Pyrenaean squamous-leaved yellow Aconite.] Aconite with leaves divided into long segments, these deeply jagged into many narrow parts, and lying over one another like scales, and pale yellow spikes of flowers.

6. *ACONITUM Cammarum.*

Wedge-lobed Purple Aconite.] Aconite with leaves divided into many wedge-shaped lobes, these cut into many acute parts, tall stem, and large violet-coloured flowers.

Varieties.] Wedge-lobed purple Aconite.—Wedge-lobed blueish-purple Aconite.—Wedge-lobed deep blue Aconite.

7. *ACONITUM album.*

White Eastern Aconite.] Aconite with palmated, three-parted leaves, acutely gashed, tall stem, and large white flowers.

8. *ACONITUM variegatum.*

Variegating dwarf blue Aconite.] Aconite with many-parted leaves, the segments half cut through, the upper ones the broadest, and small spikes of variegating blue flowers.

9. *ACONITUM uncinatum.*

Hooked American Aconite.] Aconite with leaves three or five-lobed, angulate, dentated; and large blue flowers, having the helmet or hood hooked and extended.

The above nine species and respective varieties are all of the herbaceous tribe, and have perennial roots; but the leaves and stems are renewed annually in the spring, and perish in autumn.

The roots of the common sorts are thick fleshy tubers and knobs, and those of all the species send forth many fibres, and multiply greatly.

The stems or flower-stalks rise annually from the root; which in different species attain different heights, from two to six feet, erect, round, firm, and closely ornamented with leaves below, and numerous flowers upward, arranged in a beautiful erect spike,

from one to two feet long. The leaves are large and universally simple, but deeply divided in the palmated manner into many long segments; and in some, these again are variously jagged, lacinated, or subdivided into many narrow parts in different arrangements, so that in the whole the leaves form a singularly pretty variety.

The flowers arise along the upper part of the main stem, surrounding it in great numbers, and as the top advances in height, it furnishes a daily succession six or eight weeks, and all the sorts afford plenty of seed in autumn.

The season of flowering is from the middle of May until September;—the *Aconitum pyramidale* is the first in bloom.

Use in Gardens, Propagation, &c.

Considered as ornamental plants, they make a tolerable appearance; their flowers continue long, which, together with the diversity of their leaves, afford a source of variety to the curious. They are adapted for large borders, and may be introduced in vacant spaces in shrubbery clumps, the compartments on the boundaries of lawns, or those contiguous to shady walks, &c. as they will succeed between and under trees where the shade is not considerable, particularly the common blue sorts.

Great caution ought, however, to be used in admitting them in parts of a garden where children frequent.

With respect to the bad quality of these plants, they, taken inwardly, prove a deadly poison, and the effluvia of the flowers communicate their noxious quality in some degree. It is remarkable that the blue Aconites are much more virulent than the yellow kinds. The root of the *Aconitum Anthora* is accounted an antidote to the poison of all the other species, and is the sort that is used in medicine. It is however affirmed, that if this sort grow near any of the others, it attracts their baneful property, and becomes, like them, poisonous.

Of the bad qualities of these plants, many avail themselves to get rid of vermin. A decoction of the roots destroys bugs; the same part powdered and administered in bread, or any other palatable vehicle, to rats and mice, soon proves mortal.

All the species, &c. are easily propagated by seed, also by parting the roots, which, of the common sorts, every bit having an eye or bud, will readily grow.

The seed grows freely in a bed or border of common earth, and may be sown early in spring, or rather in autumn, soon after it is ripe;

ripe; and in April or May following, the plants will appear. Give occasional weeding and watering until the beginning of August, then prick them three or four inches distant in a shady border, and in autumn or spring after transplant them where they are finally to remain.

The propagation, by dividing the roots, may be effected any time from October till March.

The chief culture they require is to have their decayed stalks cut down in autumn.

The plants are natives chiefly of the Alps, Pyrenæan, Helvetian, and other mountainous parts of the continent. The common blue forts have been long inhabitants of almost every garden, and all the others may be had at the nurseries.

ACORN, a kind of nut, and is the fruit of all the sorts of oak, evergreen oak, and cork-trees. See *QUERCUS*.

ACORUS, Sweet Rush, or *Calamus aromaticus*.

A hardy herbaceous perennial of the flag kind, and grows wild; but having a fragrant aromatic odour, is admitted in gardens.

The class and order, *Hexandria Monogynia*.

Characters.] CALYX, none. COROLIA, six concave petals, and the flowers arranged in a sort of amentum. STAMINA, six filaments, having double antheræ. PISTILLUM, a rising germen, no style, but a small prominent stigma. PERICARPIUM, a short triangular capsule, containing oval seeds.

The species is,

ACORUS Calamus.

Calamus aromaticus, or Sweet Rush.]

The plant is a sort of aquatic, it growing naturally in ditches and watery places.

It hath thick jointed roots, long narrow sword-shaped leaves, and flowers produced in a sort of amentaceous spike, supported upon a kind of leaf-like stalk, appearing in June and July.

The plant grows wild in many parts of the kingdom, and the roots may be transplanted in autumn into any moist soil of a garden: but unless the roots are in water they rarely flower.

ACTÆA, Herb-Christopher, or Bane-Berries.

The plants are herbaceous perennials, of hardy temperature, and tall growth, and esteemed as plants of ornament, being adorned with long, curiously branched many-lobed leaves, and numerous snow-white flowers, in large spikes.

Class and order, *Polyandria Monogynia*.

Characters.] CALYX, four concave blunt deciduous leaves. COROLIA, four large obtuse petals. STAMINA, many filaments, hav-

ing erect double antheræ. PISTILLUM, an oval germen, no style, the germen crowned by a depressed stigma. PERICARPIUM, one oval globular berry, of one cell, containing four seeds.

There are five or six species: those that claim attention are,

1. *ACTÆA spicata*.

Common spiked Herb-Christopher, with black berries.

Varieties.] *Actæa* with white berries—*Actæa* with red berries.

2. *ACTÆA racemosa*.

Clustered long-spiked American Herb-Christopher.] *Actæa* with tallest stalks, and very long reflexed spikes.

The first sort grows naturally in woods in many parts of England, the others were obtained from North America.

The plants are perennial in root, but the leaves and stems rise annually in spring, attain three or four feet stature, flower in summer, and decay in autumn.

The roots are composed of thick fibres, those of the second are tuberous and knobbed.

The stems or flower-stalks of the first sort rise two feet and half high; that of the second often four or five; they grow erect, and are adorned below with leaves, and the upper part with numerous flowers, arranged in very ornamental spikes terminating the stalks. The leaves are both radical and elevated on the stalks; they are compound, branched, very long, and composed each of twenty-seven lobes or folioles, the common foot-stalk of each leaf branching or dividing by threes into nine smaller, each of which sustains three lobes; and in some the radical or root leaves, including their folioles, approach two feet in length.

The flowers are snowy white, and their numbers in each spike render them very conspicuous and pretty; they appear in May, June, and July, and those of the first sort and varieties are succeeded by seed in autumn, but the second species rarely produce any in England.

The seed of these plants is contained in small berries, the size of peas.

These berries are supposed to be noxious in their quality. A single berry of the common sort is said to be instant death to poultry and other birds.

As furniture for the pleasure-ground, both the species may be employed in any of the common compartments, and are adapted for shady borders, but not immediately under trees; and may occupy vacant spaces between deciduous shrubs in the most conspicuous parts of thubberies.

Their propagation may be readily effected by seed in the common ground, which may be sown in the spring or autumn; it however is observable, that when sown in autumn, the plants rise freely the following spring, and those of the spring sowing are apt to rise straggling.

Transplant them in autumn where they are to continue, and they will flower the following year.

ACULEUS, (a Needle.) By botanists it is expressive of a prickle or sharp point, a species of armature with which the stems and branches of several plants are furnished, exemplified in the rose, raspberry, &c.

The prickle here alluded to differs from the spine or thorn, *spina*, as being only a prolongation or detached portion of the outer bark of the plant, as is apparent by such prickles being readily detached from the stem or branch along with the bark; whereas, the spine or thorn is more rigid and protruded from the wood of the plant, such as in hawthorn, buckthorn, three-thorned acacia, &c. and cannot be detached without rending some part of the substance of the wood. See *SPINA*.

ADANSONIA, *Æthiopian Sour Gourd*, or *African Calabash-Tree*.

This genus furnishes but one known species, which is a deciduous tree, of amazing bulk in its native soil, which is Africa, and is retained here in stoves as a curiosity.

Class and order, *Monadelphia Polyanthia*.

Characters.] **CALYX**, is cup-shaped, five-parted at the brim, and deciduous. **COROLLA**, five roundish petals. **STAMINA**, numerous filaments united below into one body, and kidney-shaped antheræ. **PISTILLUM**, an oval germen, very long tubulose style, having many hairy stigmas. **PERICARPIUM**, a large, oval, ligneous capsule of many cells, filled with a fungous sour pulp, containing many kidney-shaped seeds.

The species is,

ADANSONIA digitata.

Baobab, or Æthiopian Sour Gourd.]

The tree is a native of Senegal, and other parts of Africa, where it attains an enormous size, adorned with digitate leaves, of three or five spear-shaped spreading lobes.

With respect to its merit in this country, we only consider it merely as a plant of singularity, and requires the indulgence of a stove. It is propagated by seed procured from abroad, which should be sown in pots, and plunged either in a substantial hot-bed, under glasses, or that in the hot-house, in which department the plants must be always retained.

There are some plants now in England twelve or fifteen feet high.

This monstrous tree derives its present name *Adansonia*, given by Linnæus, in honour of M. Adanson, an eminent French botanist, who travelled in Senegal, and saw many of the trees growing: and the description he gives of their enormous bulk is truly amazing.

The diameter of the trunk, he says, frequently exceeds twenty-five feet, and its spreading top that of a hundred and twenty, and each branch equal to a monstrous tree in Europe, and the horizontal roots have measured upwards of an hundred feet long: and yet, amazing as these dimensions are, the tallest trees rarely exceed sixty or seventy feet. The age of the tree is perhaps no less remarkable than its enormous size: for, as the same gentleman relates, he discovered some trees about five or six feet diameter, on the bark of which were deeply engraved or cut many European names, some of which were dated, which inscriptions he thinks sufficient to determine pretty near the age the trees may attain, as supposing those in question, according to the date, grew six feet in diameter in two hundred years, how many centuries must be requisite to give them the astonishing diameter of twenty-five feet!

ADENANTHERA, *Bastard Flower-Fence*.

The plants are of the tree-kind, evergreen, and exotics, of the growth of India, and retained here in stoves by way of variety.

Class and order, *Decandria Monogynia*, ten stamina, one style.

Characters.] **CALYX**, monophyllous, and five-parted at the brim. **COROLLA**, campanulate, and formed of five reflexed petals. **STAMINA**, ten filaments with roundish antheræ. **PISTILLUM**, an oblong germen, one style, and single stigma. **PERICARPIUM**, a compressed pod, having many smooth seeds.

The species are,

ADENANTHERA pavonina.] *Adenanthera* with exceeding large decompound or branching smooth leaves.

ADENANTHERA Falsata.] *Adenanthera* with decompound leaves, woolly on the upper sides.

These trees attain a large size in India. Both species are adorned with very large and beautifully branched leaves, the singularity of which is the merit of the plants in this country.

They are raised from seed procured from abroad, and its vegetation must be effected by artificial heat, the plants kept in pots, and continued always in the stove.

AD-

ADIANTUM, Capillus Veneris, or Maiden-hair.

The plants are herbaceous and perennial; there are many species, one or two of which are admitted in gardens for variety.

This genus is of the class *Cryptogamia*,—flowers imperfectly visible.

Characters.] The plants are of the fern tribe, whose flowers are either entirely concealed or imperfectly visible, (see *FILICES*) which, in the plants in question, are fixed in numerous small spots upon the back of the leaves, the points of which are reflexed.

The species that merit notice are,

1. **ADIANTUM Capillus Veneris.**

True Maiden-hair.] Adiantum with compound, alternate, wedge-lobed leaves.

2. **ADIANTUM pedatum.**

Foot-shaped Canadian Maiden-hair.] Adiantum with foot-shaped pinnated leaves with gibbous lobes, and fructifications in the divisions.

The first sort is a native of France, Italy, and places adjacent; the second of Canada; and both require shelter from frost.

The roots are fibrous and creeping.

With respect to their stems, they are not to be distinguished from the foot-stalks or ribs of the leaves, as is common to most of the fern tribe (see *FILICES*); they, in both species, divide into many leaves, which, in the *Capillus Veneris*, are like those of coriander, and fragrant and agreeable in taste.

Both these plants are propagated by dividing their roots, which should generally be planted in pots of dry soil.

ADONIS, Flos-Adonis, i. e. Adonis Flower, sometimes called Bird's-eye.

This genus retains several species of herbaceous plants, of the flowery race; two are annual, the others perennial, of stature from twelve to twenty inches, and with every stalk, branch, and shoot, terminated by solitary flowers.

Class and order, *Polyandria Polygynia*.

Character.] **CALYX** pentaphyllous, coloured, and deciduous. **COROLLA**, from five to twelve petals. **STAMINA**, many short filaments, having reflexed antheræ. **PISTILLUM**, many germens and stigmas. **PERICARPIMUM** none, many naked seeds being attached to the pedicle, forming an obtuse spike.

There are six species; those of note are,

1. **ADONIS autumnalis.**

Common autumn red Adonis.] Adonis with flowers having sometimes eight petals, these red and marked with dark spots.

2. **ADONIS æstivalis.**

Summer flowering yellow Adonis.] Adonis with flowers having generally five petals, of a pale yellow colour.

3. **ADONIS vernalis.**

Spring flowering yellow perennial Adonis.] Adonis with large yellow flowers, having about twelve petals.

The two first sorts are annual, i. e. the plants come up, attain their full growth, flower, perfect their seeds, and perish root and branch, the same year. They are of bushy growth, from twelve to eighteen inches high, branching every way from the bottom, decorated with abundant foliage, finely cut or divided, and the ends of all the branches and lateral shoots are adorned with flowers, which stand singly.

These two flower in May, June, and July, and the seeds ripen in autumn.

The third sort is perennial in root, which is fibrous, but the stalks are renewed annually.

The stalks of this rise eighteen or twenty inches high, several arising from the same root, each of which is surmounted by a large yellow flower, which appears in April, and the seeds ripen in autumn.

All the three species are proper furniture for common borders, or to adorn the fronts of the shrubbery compartments, in assemblage with other herbaceous plants.

Their propagation is by seed in the common ground, sown in autumn, or early in the spring, i. e. February or March. The third sort also by off-sets of the roots.

The two first sorts should be sown in the places where it is designed the plants are to flower, for they do not succeed so well by transplantation; it is most eligible to sow them in small patches (see *HARDY ANNUALS*), covering the seed near half an inch deep; when the plants are two inches high, thin them, leaving only three of the stoutest in each patch; their farther culture is occasional weeding and watering.

If the seed of these two species is sown in autumn, i. e. September or October, the plants flower earlier by a month or two than those of the spring sowing, as is evident by the plants which arise from the scattered or self-sown seeds.

The following are also of this genus.

ADONIS Apennina.] Apennine Adonis with large flowers, having fifteen petals.

ADONIS Capensis.] Cape Adonis with doubly ternate leaves, the lobes cut and indented, and ten-petaled flowers.

ADOKA, Tuberos Moschatel, or Hollow-root.

There is but one species, a uberous-rooted, hardy, herbaceous perennial, of diminutive growth, esteemed as a flowering plant.

Class and order, *Ostendria Tetragynia*.

Character.] CALYX, monophyllous, bifid, and permanent. COROLLEA, monopetalous, divided into four acute segments. STAMINA, eight filaments with roundish antheræ. PISTILLUM, the germen resting upon the calyx, supporting four styles. PERICARPIUM, a round berry of four cells, containing four seeds.

The species is,

Adoxa Moschatellina.] Moschatel or Musk-smelling Adoxa, with a bulbous fumitory leaf.

The plant grows wild in woods and shady places, and is admitted in gardens more for variety than beauty.

It grows five or six inches high; the root is tuberos and pointed, from which rise small leaves, having many minute lobes; the stalk is slender, and adorned at top with four or five small whitish flowers, which appear in April, and the berries ripen in May.

The propagation of this plant is by the offsets of its root, when the leaves decay in summer.

It prospers best in the shade.

ÆSCHYNOMENE, Bastard Sensitive Plant.

There are twelve species, three or four of which are annual, the others perennial, of somewhat shrubby growth, natives of hot climates, and preserved here in stoves for variety.

Class and order, *Diadelphia Decandria*.

Characters.] CALYX, monophyllous, cut into two parts, the upper segment bifid, the lower trid. COROLLA is *papilionaceous*, or butterfly-shaped, the standard large and heart-shaped, the wings short and oval, and the keel long and moon-shaped. STAMINA, ten filaments; nine united, one separate. PISTILLUM, an oblong germen, arched style, and simple stigma. PERICARPIUM, an oblong deeply-jointed pod, each articulation having one seed.

The species that merit notice are,

1. *ÆSCHYNOMENE aspera.*

Rough-stalked Æschynomene.] Æschynomene with rough herbaceous stalks, and deeply-jointed rough pods.

2. *ÆSCHYNOMENE arborea.*

Tree Æschynomene.] Æschynomene with a tree-like smooth stem, smooth-jointed pods, with the articulations half heart-shaped.

3. *ÆSCHYNOMENE grandiflora.*

Great-flowered Æschynomene.] Æschynomene with a tree-like stem, large flowers, and long slender pods.

4. *ÆSCHYNOMENE Sesban.*

Egyptian obtuse-lobed Æschynomene.] Æschynomene with a smooth stem, leaves having obtuse lobes, and cylindrical equal pods, not jointed.

The first species is chiefly annual in this country; the others are perennial both in root and stem in their native soil, and may be continued so here by the aid of a stove.

They attain in height from four to seven feet: the stem of the first is herbaceous, and attains four feet height; that of the others is woody, and rises seven feet high, erect, and divided into branches upward, where all the species are closely adorned with leaves, which are universally winged, and composed of many folioles or lobes, arranged along each side of the middle rib. The flowers issue from the angles of the leaves; they are composed each of four petals, and are of the pea-bloom form, arise two or three together, the colour chiefly yellow—those of the fourth sort in long pendulous spikes, and assume a copper colour, appearing in summer, and are succeeded by long leguminose pods in autumn.

The propagation of these plants is by seed, assisted by a hot-bed in March or April; when the plants are two or three inches high, transplant them into separate small pots, and plunge them in the hot-house.

ÆSCULUS. The Horse-Chestnut-Tree.

There are but three species and some varieties, all of which are hardy deciduous trees, adorned with large digitate leaves, and pyramidal spikes of pentapetalous flowers, esteemed principally for purposes of ornament in gardens and parks, &c.

Class and order, *Heptandria Monogynia*.

Characters.] CALYX is monophyllous, and five-parted at the brim. COROLLA, five roundish petals inserted into the calyx. STAMINA, seven declinated filaments, having erect antheræ. PISTILLUM, a roundish germen, single style, and pointed stigma. PERICARPIUM, the calyx becomes a large round prickly capsule of three cells, including one or two nuts.

The species and varieties are,

1. *ÆSCULUS Hippocastanum.*

Common Horse-Chestnut.] Æsculus with digitate leaves, having seven entire lobes, seven stamina to the flowers, and prickly capsules.

Varieties.] Common Horse-Chestnut with gold-striped leaves.—Common Horse-Chestnut with silver-striped leaves.

2. *ÆSCULUS Pavia.*

Scarlet Horse-Chestnut.] Æsculus with digitate leaves, having five or six sawed lobes, red

red corolla, claws the length of the calyx, having eight stamina, and smooth capsules.

3. *ÆSCULUS flava.*

Yellow-Flowered Horse-Chestnut.] *Æsculus* with digitate leaves having five lobes, and yellow corollæ with roundish heart-shaped laminæ, the claws twice the length of the calyx.

The first species is originally a native of Asia, the second of America; but both sorts are extremely hardy, and prosper here in any common soil or exposure.

The Common Horse-Chestnut and varieties grow thirty or forty feet high. The trees assume a formal growth, the branches extending regularly on every side, and diminish so gradually in length from the bottom upward, as to give the head a beautiful conic form, which in summer is abundantly furnished with luxuriant foliage, and adorned with innumerable large spikes of white flowers, tinged with red, arising in erect position at the extremity of almost every shoot, which are very conspicuous at a considerable distance.

The second species, Scarlet Horse-Chestnut, attains twelve or fifteen feet stature, the branches moderately spreading; the flowers are of a red or scarlet colour, grow in spikes like those of the common sort, though not so large, but make a pretty appearance.

The leaves of all the species are digitate or fingered, and very large; those of the common sort have seven long, broad, obtuse lobes; but the scarlet kind have rarely more than six, which in both sorts unite at their base, where they are attached to the foot-stalk, and expand like the fingers of a hand.

The flowers of the Common Horse-Chestnut appear in May and beginning of June, and those of the others in July.

The nuts of the common sort ripen plentifully in autumn, but those of the second and third do not always ripen perfectly in England: they are useful only for propagation.

Abroad the nuts of the common sort are made into meal and given to horses: hence they derive the name.

The Common Horse-Chestnut has been long cultivated for purposes of ornament in extensive gardens, lawns, parks, &c. It was formerly much employed to form avenues and shady walks: but the mode of planting these trees in long continued lines or ranges, as was the former practice, affords no variety; nor do the trees appear to advantage in that order of arrangement. They have a fine effect placed singly and considerably detached; their natural form of growth adapts them for this, and they may be employed in extensive places, to form detached clumps of two, three, four,

or more trees together, and in some places grouped with others of similar growth, placing them in different forms of arrangement to effect variety.

In large ornamental plantations, some trees may be interspersed to advantage toward the front.

If required to adorn avenues, it should always be in assemblage with other trees, such as the lime, greater maple, common or Spanish chestnut, and other formal trees with large foliage.

For purposes of shade the trees are properly adapted, but not as thickets, because when they stand close they do not retain their leaves so abundant in continuance during the summer, as when they stand distant.

The timber of these trees being of no considerable value, they are not much cultivated for that purpose: it however being often used by the turners, and as the trees grow fast to a large size, some should be admitted in wood plantations.

The Scarlet and Yellow-flowered Horse-Chestnut merits a place in all ornamental plantations, where they should occupy spaces towards the front, and their scarlet flowers will effect an agreeable variety.

Propagation.

The common sort may be raised plentifully by planting the nuts; and the best time is in February; as, if planted in autumn, many may rot in winter; but until the season of planting arrives, it is necessary to preserve them in sand, to prevent mouldiness.

The nuts may either be bedded in, or planted in drills, two or three inches deep; the plants will appear in April, or beginning of May; by the end of summer they will be eight, ten, or twelve inches high, and in autumn or spring following they may be transplanted in the nursery way, in rows thirty inches distant, and half that distance from one another in each row.

In this nursery let them remain four or five years; when, as the plants are of very quick growth, they will be six or seven feet high, and may then be employed in plantations.

The two varieties with striped leaves may be increased by layers, and by budding or grafting them upon stocks of the common sort.

The scarlet yellow sorts may also be propagated by planting the nuts; those of American growth are generally the most perfectly ripened; however, as the nuts are sometimes difficult to be procured, the trees may likewise be readily increased by budding or grafting them upon stocks of the common horse-chestnut.

If it is however intended to raise them from nuts,

nuts, the aid of a hot-bed will greatly facilitate their vegetation.

Plant them in pots in the spring, and plunge them in the hot-bed. When the plants appear, indulge them with the free air daily, and in a month remove the pots to the full air to remain till October; then place them to have occasional shelter from frost, and in spring transplant them in rows in the nursery.

ÆTHUSA, Fool's Parsley, or Lesser Hemlock.

As this is a common annual weed of noxious quality, we only mention it by way of caution; the leaves of which, while young, are so like those of common parsley, as not to be distinguished without some attention; and has often been inadvertently gathered with it, to the fatal experience of many.

To remove all suspicion, it is most eligible to cultivate only the curled-leaved parsley, which may with facility be distinguished from the weed in question, which should be diligently eradicated.

AGAPANTHUS, *african Lily*.

This genus is of the lily tribe, producing clusters of large umbellate flowers.

Class and order, *Hexandria Monogynia*.

Characters.] **CALYX**, an oblong sheath opening on one side. **COROLLA**, monopetalous, funnel-shaped and regular, the tube angular, and border divided into six parts. **STAMINA**, six filaments shorter than the corolla, declining, and topped with reniform antheræ. **PISTILLUM**, an oblong three-cornered germen, style slender and declining, topped with a simple stigma. **PERICARPIUM**, an oblong three-cornered capsule containing in three cells numerous oblong seeds.

We know but of one species,

AGAPANTHUS umbellatus.

African asphodel Lily.] Hath a root with many tuberose fibres collected into a bulb at their tops, from whence arise several spear-shaped leaves two ways, and from one side arise round hollow flower-stems, two or three feet high, terminated by a large umbellate cluster of spathaceous long funnel-shaped flowers of a bright blue colour. This species must be retained in the green-house during winter.

Propagation.

By off-sets from the sides of the main roots in the middle of summer, turning out of the pots, and slipping off the young roots or bulbs, planting each in a pot of light rich earth, shading them for a few weeks, and giving water occasionally, they will probably flower the following autumn, but towards the end of October should be placed in the green-house, there to remain during the winter,

AGARICUS, *Agaric* or *Mushroom*.

The genus is of the class and order of *Cryptogamia Fungi*. Its characters are, stem short, head horizontal, with lamellæ or gills underneath.

This genus consists of a numerous family of plants; many of the species are of a poisonous nature. There is but one species for our purpose, viz.

AGARICUS campestris.

Common Red-gilled Mushroom.] Mushroom with a head convex, scaly, and gills of a deep flesh colour; it is found frequently in pastures, and is much cultivated in gardens for its delicious flavour.

General Observations on the Nature, Growth, and Generation of the Plant.

The mushroom rises from the ground in its perfect form, in different degrees of growth, in the different plants; in small, middling, or larger heads; or some issuing through the surface half, or nearly full-grown; each advancing with a robust erect stem, only about an inch to two or three high, and half an inch to an inch in diameter; crowned with the round fleshy head or cap, convex above, and concave underneath: the concavity filled with numerous lamellæ or gills; and, in its increasing growth, attains from two, three or four, to five or six inches diameter, without ever discovering any visible flower or seed; hence it comes under the above botanic class and order, comprehending the very extensive tribe of fungous plants, which have concealed or doubtful fructifications or generative organs. But it is supposed, that the unknown flower and seed, if any, being invisibly minute, are secreted in or between the gills, and that when the plants arrive to full growth, the head expanding almost flat, becoming a large flap, falls to the ground; thence disseminates the supposed invisible seed to adjacent and distant soils and situations, where vegetating in its peculiar manner, it produces that white fibrous progeny called spawn, formed within the surface of the earth, and in dung, running and spreading in numerous thread-like white strings, or radicle-fibres, productive of a number of minute granulate white knobs, or tubercles, being the embryo plants, which gradually increase in small round heads, enlarging quickly to perfect mushrooms, effecting their growth, more or less, partly within the ground and partly above, or some forming a considerable growth within the earth, suddenly, as it were, make their eruption through the surface, arrived to quarter, half, or nearly full-sized heads, often discovering themselves in a morning in places where there was no appearance of any in the evening

evening of the preceding day; as may be often observed in their natural productions.

Thus, from the above-mentioned spawny progeny, by whatever means it originates, the mushroom is produced both in its natural growth, and by garden culture; in which latter it is most generally obtained in greater perfection, and at any season of the year, when required, effected by planting the divided lumps of spawny earth, or dung, into the sides of ridge-formed horse-dung hot-beds, reduced to a moderate heat, as hereafter is fully explained.

But the generation of the mushroom tribe has long afforded much speculation to naturalists, with respect to being perfect or imperfect plants; the flower and seed, from their exceeding minuteness and obscurity (if they really exist at all), remaining invisible even by the aid of the microscope: many, therefore, suppose they owe their origin entirely to the putrefaction of earth and dung: this sort of soil, however, first discovers their yet only visible generative faculty, under the form of fibrous strings denominated spawn, before intimated, and which in the progress of vegetation, either naturally, or forwarded by garden culture, proves the only certain known means by which the mushroom is produced; though it is generally supposed by the experienced modern botanists, that the said spawn has its origin from the mysterious production of seed of the respective preceding plants, which is the more probable, as the genuine spawn always produces invariably the same sort of mushroom.

On this subject, however, the botanic world have been long divided in opinion; the moderns generally contend for the flower and seed; and have, in a manner, confuted the doctrine of putrefaction; and consider the mushroom as a true and perfect plant, produced originally and occasionally by seed afforded by some mysterious secret in nature.

The invisible seed, probably in the form of fine dust, being discharged on the adjacent soil, and thence disseminated by the air to various situations adapted to its nature, germinates and shoots forth into stringy radicles, forming the spawn and embryo plants for the production of the future mushrooms, is probably the reason that we often find both abundance of spawn, and sometimes mushrooms, in obscure places, where none were ever observed before: in decayed dung hot-beds, horse-dung hills, dungy composts, and in bye dry places where horse stable dung has lain moderately dry some considerable time undisturbed till become of decayed state; as well as in meadows and pasture fields.

The spawn, however, by whatever cause it is produced, generates and increases considerably, for affording a plentiful propagation and production of mushrooms; by extending and spreading its stringy fibres in the earth or dung; both where naturally situated, or placed by culture; or more especially the latter; as, when the pieces of spawny dung, &c. are planted into garden mushroom beds; it runs and overspreads the whole just within the surface, as well as penetrates into the bed; and thus yields a production of mushrooms often in regular succession for several months; and at last, when the production declines, often furnishes some good fresh spawn in the interior parts of the bed dung, for future occasions; though generally maiden spawn, or that which was never worked in a bed, or produced mushrooms, is preferable for a more certain plentiful crop of good full fleshy heads.

But, besides the common red-gilled mushroom, some authors mention several other species of the fungous tribe, which, as well as that now under consideration for culture, are good and wholesome to eat.

We, however, give every possible preference to the *Agaricus campestris*, to the exclusion of all others, as the only sort adviseable to recommend for garden culture: and which appears as if nature pointed it out as the principal salutary species for domestic occasions, by its *lamellæ* or gills underneath, always assuming a reddish fleshy colour, as well as the plant imparting a particular agreeable smell and relish peculiar to the true wholesome mushroom, whether produced by garden culture, or naturally in meadows, &c. in which, as well as this true sort, there are also produced many spurious and deadly kinds.

It may be proper just to observe, that, although mushrooms grow spontaneously in meadows and grass pasture fields, they are obtained there accidentally only, and at a particular season (latter end of summer and in autumn) and not always to be depended on as the wholesome eatable kind: but by garden culture we procure these plants at any time of the year whenever they may be required, and always of superior goodness both in substance and richness of flavour; and by generally procuring principally the proper dung spawn for planting, is attended with the greater certainty of their being of the genuine salutiferous kind; a matter of the utmost moment, since, as in the field productions, there are so many of a pernicious quality, bearing so great an external similarity to the true eatable kind under consideration, that having been inadvertently gathered by the unskilful, have proved fatal to thousands.

As the culture of the mushroom often proves more precarious and disappointing than that of almost any other garden production, owing to its very singular nature, and peculiar mode of treatment not being generally conceived, greatly differing from all other horticultural vegetables: we shall, therefore, give a full display of the whole process in the different practical proceedings necessary in its successful cultivation, explained under several heads.

Cultural propagation by Spawn; the proper Sort; and where attainable.

The general method of propagating and raising the mushroom by garden culture, is by planting lumps or pieces of spawnny dung or earth into a sort of hot-bed made with horse-stable-dung, formed in a long narrow ridge, both sides sloping, like the roof or ridge of an house, to shoot off the falling wet of rain and snow, &c. and when the great heat of the bed is abated to a very moderate degree, the spawn is then inserted into both the sloping sides and ends, as hereafter explained, and the bed then earthed over not more than two inches thick; and the whole afterwards covered with dry straw, or clean dry straw-litter, laid a foot thick, constantly to remain night and day to defend the bed effectually from the external air, wet and cold; for the spawn being of a particular delicate nature, is impatient both of extreme hot-bed heat, cold air, and of any considerable moisture; all of which should be carefully guarded against, as hereafter explained; and thus the peculiar mild heat of the bed will soon vivify the spawn and set it in motion, running and spreading itself in the earth and dung; so as, probably, in five or six weeks the bed will begin to afford a first production of mushrooms.

But the above being only principally some necessary previous intimations, conveying introductory ideas of the general method: and as the whole practical process thereof in preparing, making, spawning, and general culture of a mushroom-bed, requires some considerable explanation, they will be found fully displayed in the proper place; shall here first give the necessary directions concerning the proper spawn, where attainable, and of collecting and providing the requisite quantity in proportion to the intended extent of the bed or beds; for spawn being the principal agent in mushroom culture, and without that necessary material, nothing can be done in this business, its attainment should be our first consideration.

The proper spawn, as before observed, discovers itself most commonly in the peculiar soils of decayed dung and dungy composts, &c. in numerous white stringy fibrous radicles,

often interwoven in the soil; and if of the true sort, imparts a good smell of the mushroom: and, which is generally obtained in the greatest plenty and perfection in summer and autumn; though it is occasionally met with at all seasons of the year.

Therefore of this sort of spawn, it may generally be adviseable to procure the proper supply in readiness, previous to making the bed, in order that you may be able more readily to judge of what extent of bed to determine upon; especially as in some places good spawn is sometimes difficult to be obtained in any considerable abundance; so that, either before or after making the bed, according as the spawn is occasionally met with in old hot-beds, decayed dung lays, dungy compost heaps, &c. it should be carefully collected, taking the lumps of spawnny dung entire, and deposited in some dry place till wanted:—and of which the requisite quantity is at the rate of two or three bushels at least, for a bed of twenty feet long; and so in proportion for one of fifty feet in length, or more.

Spawn is often discovered in various situations and soils, and frequently in places where it could not possibly be expected: but the most certain good sort for garden culture is obtained the most readily and abundant in lays and parcels of dryish decayed dung and dungy composts: but commonly most plentifully and good, in dry rotted horse-stable-dung, composed of the short dung and moist litter together, as cleared out daily from the stables; and having lain either in collected dung-heaps, or formed into hot-beds, or composts, &c. and remained some months, or any considerable time, till its great fermentation and heat are decreased, and a state of decay and putrefaction commenced; not buttery rotten, but in a middling degree moist or dry: and as this kind of dung is generally more adapted to the generation of spawn than any other, proves a favourable circumstance, as horse-dung is every where to be met with.

Therefore, in collecting spawn, should be careful to search some adjacent old dung-hills, of horse-dung, &c. and dungy compost heaps, and in stable yards, where lays of horse-dung have been for some continuance in a state of decay, especially towards any dry corners or sides next a wall, &c. as also in horse-rides under cover, such as in the public livery-stable-yards, being generally thickly littered with short stable-dung, in which searching towards the sides, are often discovered large cakes of most excellent virgin spawn; likewise in covered horse-mill tracks, where horses are employed in turning mills and engines, as in several

several large manufactories, may also generally obtain parcels of similar good spawn proper for our purpose. Likewise in removing decayed dung hot-beds, old mushroom beds, we may often find great plenty of excellent good spawn; and sometimes in kitchen gardens, where the ground has been thickly dunged in the spring with dryish half-rotted dung, that on digging the same ground again in autumn, &c. and looking with care, may frequently find good lumps of spawn in the remaining unexhausted dung; and in clods of mellow dungy earth. So that in all decayed dry-lying dung heaps, and old hot-beds and dungy composts, or other lays of rotted horse-dung, &c. not become buttery rotten, as before intimated, but moderately moist or dry, we may generally be successful in spawn; and, as sometimes in continued dung heaps, of the above temperament, mushrooms are observed to rise naturally in summer or autumn, and in which supplies, more or less, of proper spawn may be discovered.

And lastly, spawn may be procured in meadows and other grass pastures, towards the latter end of summer and in autumn; the places of its growth being then the most discoverable by the mushrooms rising in their natural production; and at the same time they discover whether of the true sort or not, either to take or reject the spawn accordingly: so that, breaking up the turf, the spawn will be found in the earth, which may be dug up in lumps for use, where a sufficiency of dung spawn cannot be obtained.

However, where enough of dung spawn can be possibly procured, I would greatly prefer it to that of the field, for this occasion, of garden culture, for the reasons before explained.

In horse-dung spawn it is generally observed that where the dung happens to consist principally of that from stone-horse stables, it proves of a stronger quality than that of the common horse-dung; and, in its culture, more productive in large thick fleshy heads; and continues longer in production in the same bed.

The mushroom gardeners in the vicinity of London, where vast quantities are cultivated for the markets, generally prefer what they call the virgin or maiden spawn, being such as has never been worked or produced mushrooms, nor that has been generated from such in any old beds; and it generally possessing greater vigour in its cultivated growth to afford a more certain superior production.

But spawn is sometimes generated and produced by art by a compost of horse-dung and earth; and which, some contend, is effected entirely by putrefaction of these soils together,

without any intervention of the supposed seed; but this I greatly doubt, and rather think the previous seed wasted to various situations, remaining dormant till accidentally introduced by some means into the proper soils, of peculiar temperament for its vegetation, as the spawn produced from the above compost is generally productive of the same species of mushroom; however, this compost is formed of a quantity of horse stable dung, of very moderate heat, the shortest moist parts, and as much of the dunging of the horses as possible, and the whole mixed with some rich mellow earth, or if of a loamy kind, the better; and deposited under the protection of some covered shed, or other place; and the mass closely covered with dry litter; the spawn will thus sometimes be formed in the said compost in six or eight weeks.

Or sometimes spawn is produced apparently by the seed undoubtedly, by procuring a quantity of full-grown mushrooms, cutting them to pieces, or only detaching the gills, which being deposited into composts as above, or at once in the regular beds, strewed over the surface, earthed over, and covered with straw litter.

However, in the general practice, the most common method is to procure a requisite supply of the natural spawn produced as before mentioned.

The most successful season to find natural spawn in the greatest plenty and perfection, is the autumn, and early part of winter, while in full vigour, after the preceding summer's production; though good spawn is occasionally met with at all times of the year, and may be collected accordingly: it, however, is most advisable to procure the general necessary supply in the afore-mentioned seasons: for spawn being of a singular temperament, liable to perish or be greatly injured by much wet and cold, it should be carefully collected in proper time, as above, before it is weakened by the inclemency of the weather; as it is of much importance to have it in full vigour; when, if in a tolerably dry state, it may be directly used, if required, for spawning such beds as are ready for its reception: or if rather wet, should remain under cover a few days, or a week, to dry moderately.

In collecting the spawn, should be careful to have the lumps or cakes of the spawnny dung, &c. in which it appears, taken up entire, laying them in a basket or wheelbarrow, and carried into some dry close shed, or other apartment, to be deposited securely from wet, cold, &c. previously noticing whether any of the cakes be wet, and in which case, spread them to dry a little; then, if not im-

diately wanted, let the whole be placed close together in a warm dry corner, or occasionally placed in hampers or sacks; and in all of which, the whole closely covered with straw, or dry long litter, or garden mats, till wanted for spawning the beds; and thus, by observing these particulars, its vegetative power may be long retained; and, where occasion, it may be safely sent to any distance, as is often the case in places where a sufficiency cannot be procured at the time when wanted; and in which case, it may be occasionally obtained by purchase of some market kitchen gardeners, and by application to nurserymen.

In the neighbourhood of London, where great quantities of mushrooms are raised for the markets, and consequently require considerable supplies of spawn accordingly, there are mushroom-men who, at the proper season, go about collecting, both in town and country, the true sort, which they dispose of generally by the bushel, half-a-crown to five or six shillings, according to its goodness or plenty.

We should be particularly careful to reject spurious or false spawn; for there is a degenerated variety of the mushroom, called White Cup, rising with small, thin, white heads, without any material fleshy part; and the spawn of which is entirely useless, as has been often experienced, to the great disappointment of a crop, where it has been inadvertently planted: is distinguishable generally by its very fine silky or cobweb-like nature, and very white hoary appearance, closely spreading in the spawny lumps; and emits scarcely any smell of the mushroom.

Thus far concluding what is necessary to observe relative to the spawn, we now proceed to explain the particulars of making, spawning, and general culture of the proper beds in which to obtain a good production.

Making the Mushroom Bed.

To proceed in explaining the general method of making, spawning, and management of the mushroom beds, let it be first observed that the most general successful season for making the principal beds, for a good winter and spring production, is the autumn and beginning of winter; that is, the autumn beds may be proceeded in about the middle or latter end of August, or any time in September is a most eligible time, or occasionally till the middle or end of October; as in the above season the spawn, as before observed, can be had in the best perfection and abundance, and the beds made and prepared for the spawn to better advantage than if made later, when cold very wet weather prevails; and the spawn will also work sooner and more prosperously to produce

a speedy and abundant crop, in continuance, great part or all the winter: but beds for successional production, or where unavoidably omitted in autumn, may be made in November, or even December,—though it may also be observed that a mushroom bed may occasionally be made in any of the winter or spring months, either for succession or as may be required.

The most proper material for making mushroom beds is horse-stable dung; no other answers the purpose; the dunging of the horses, together with the moist straw-litter of the stalls in the stables rendered wet by the urine of the animals, being together of a hot quality, that when collected in some quantity, either in an heap or formed into a bed, ferments, and acquires a strong degree of heat of some considerable duration; but as this heat generally proves too violent at first for the growth of vegetables, and more particularly that of the mushroom spawn, the dung should always be previously prepared before worked up into a bed, to reduce it to a more moderate temperature, by forking it up mixedly together in a heap for a week or two at least; and turned over once or twice, that the rank burning steam may sooner and more effectually evaporate, before its fermentation in a too hot degree; so that a quantity of the best moderately fresh dung must be procured in sufficiency, proportioned to the size or extent of the intended bed, at the rate of about three or four large cart-loads for a bed of twenty feet long, and so in proportion to any length intended.

As to the general dimensions, &c.—a mushroom bed may be made of almost any extent in length, from ten feet to fifty or more, according to the quantity of mushrooms required; and three feet to three and a half or four feet wide at the bottom, both sides gradually narrowed in a sloping manner upward, till meeting together in a ridge at top, about three and a half or four feet high perpendicularly; which will allow for its settling to three and a half or more; the ridge-form manner being the most necessary and eligible whereby to preserve the bed and spawn always most effectually dry, very material in the culture; and the sloping sides more quickly discharge the falling wet of rain and snow, as well as afford a larger scope of surface for spawning, furnishing a greater production accordingly.

In regard, however, to the necessary general extent of a mushroom bed, according as may be required for private or public supply, it may be observed in the former, that a single bed, of about ten or fifteen to twenty or thirty feet long, may be sufficient for a small, or middling family; or where the demand is more considerable,

siderable, one or more beds may be made in proportion; and in the latter, intended for the public supply of markets, the length may be extended more or less, according to the supply required, or in two or more separate ranges extending parallel, or as may be convenient.

In providing the dung for the bed, chuse that which is middling fresh and abounding in a moist lively heat, the dung and litter together, rejecting such as is very long, dry, or decayed, and such as has already exhausted its fermenting property; taking the proper sort, long and short together, as it comes to hand; and which, as brought from the dung-lay, toss up in an heap in a mixed order, that the whole mass may be equally incorporated, and acquire an equal degree of heat: thus let it remain to meliorate, one, two, or three weeks, according to the quantity and strength of heat in the dung: the greater the heat in any violent degree, the longer it should remain, to moderate and improve its quality, by discharging the rank steam, and fierce ferment; which may be forwarded by turning it over once or twice; and, being thus prepared, proceed to make the bed.

With respect to the situation in which to make the bed, it may either be in the melonary or cucumber ground, in a dry elevated part thereof, and warm exposure; or in any of the dry-lying compartments or quarters of the kitchen-garden.

It would be adviseable to make the bed entirely on the surface of the ground, rather than forming a shallow trench, in which to make the bottom part, as sometimes practised; for, by making it wholly on the surface, we have both the opportunity of spawning the whole more readily quite to the bottom, and which part will be more secure from being chilled by standing water in winter, or after hard rains, &c.

In the allotted place, mark out the width and length of the bed agreeable to the former intimations; and if two or more beds are intended, they may be ranged parallel one beside the other, six or eight feet asunder.

Proceeding to make the bed, let the dung, prepared as before advised, be wheeled in, long and short together, as it happens; and, having a handy two or three-tined fork, begin to form the foundation of the bed, by shaking some of the longest dung evenly all along the bottom, four or five inches thick: then taking the general dung as it occurs, work it into the bed, forming it at first to the full width, and gradually narrowing upwards, by drawing in each side moderately and regular; generally in advancing a yard or two in length, raise it

by degrees, in the ridge-form, to the full height of three feet and a half, or four feet, as a guide to the whole; continuing it along regularly in that manner lengthwise, in the same proportion; making the middle and sides equally full, beating the dung in firmly with the fork from time to time, as you proceed in applying it on the bed: and be careful to form both sides of an equal slope, narrowing the width regularly upward till the two sides meet and terminate at top in a ridge, as before intimated; each end to be also proportionally sloped: the whole firmly wrought to preserve the proper uniformity, and to prevent settling unequally, or too considerably; for the bed should be full three feet, or three and a half perpendicular height, when settled; finishing the work by beating both sides in firm and even. And being thus completed in the ridge-form manner, the spawn is to be planted into both the sloping sides and ends, in a week, fortnight, or three or four weeks, accordingly as the first violent heat subsides, and reduced to a very moderate temperature, as hereafter.

The bed being made, it must be permitted to remain some time, probably a week, fortnight, or three weeks, or more, till the first great ferment transpire, and reduced to a proper degree of mild heat before the spawn be planted; and, during this interval, must continue it fully exposed to the open air, day and night, that its heat may come on gradually, without any burning effect; or, if excessive rains, &c. should happen, cast some dry long straw-litter at top, or spread some thick garden mats, so as to shoot off as much of the falling wet as possible, lest it either retard the heat, or occasion it to increase too violently. For the bed will generally acquire an extreme degree of heat in about a week after it is made, and sometimes continue in that state a fortnight or more; and frequently an extensive bed will remain in a very high state of heat three or four weeks, and, therefore, must on no account be spawned till this excessive heat subsides to a very moderate lively warmth; otherwise, if too violent, the tender spawnly radicles and minute tubercles of embryo plants, would, by one day's great heat, be inevitably perished, which is often the cause of many mushroom beds proving unproductive, the spawn being perished at first setting off: and, therefore, should carefully observe the operation of the heat, both in its increasing and decreasing state; and, as an assistant guide to this, let some long sharp pointed sticks be thrust down, in different parts above, into the dung; and by drawing these up occasionally, and feeling them in the hand, you will thereby be better able to judge more readily

readily of the working and different degrees of heat in the bed, discovering when reduced to a proper mild temperature for the reception of the spawn. However, should be careful, at the same time, to have the spawn inserted as soon as the bed discovers a proper state of heat, while it remains of a moderate lively temperature, sufficient to set the spawny radicles in motion, and forward their shooting their increasing fibres abundantly in the dung and earth, as well as forward the formation of the young mushrooms in a plentiful production.

Method of Spawning the Bed.

After the bed has been made a fortnight or three weeks, it will probably be arrived to proper order for spawning, which you will examine carefully by the trying-sticks, to observe that it is decreased to a very moderate lively heat, agreeable to the foregoing precautionary intimations; and in which eligible state of the bed, lose no time, but take the first opportunity to perform the spawning, not let the bed exhaust its proper heat ineffectually without being planted.

Bring out the spawn in a dry day, and proceed to planting; having been previously careful that the spawn is tolerably dry.

It is to be planted, the spawn, and lumps or pieces of dung together, in which it is contained; but observing to break or divide the large cakes, or lumps, into moderately smaller pieces, and which plant into the sloping sides and ends of the bed, in one or other of the following methods, viz.—planting into the dung just within the surface, then earthing over an inch or two thick—planting on the surface of the dung, and earthed over—or by first earthing the bed an inch or two thick, then spawning in the earth, adding an inch depth more over the whole. Each method perform as follows:

1. *Spawning in the dung.*—The spawn placed ready in a basket, and being divided, where necessary, into moderate pieces, proceed to deposit it just within the dung, at small distances, in rows lengthwise the bed: beginning the first row within half a foot of the bottom, making a small aperture for each piece, by gently raising the dung with one hand, whilst with the other you directly insert the piece of spawn, turning the dung down upon it close: proceeding in the same manner with the rest, five or six inches distance in the row, and the rows six or eight inches asunder, or a little more or less, proportionably to your supply of spawn; observing that when any pieces of spawn are very small, may plant two, three, or more together in a place: and thus proceed in spawning both sides, and each end, equally in regular order; which done, let the small crumbs remaining at last be laid evenly

along upon the top, which finishes the work of spawning; then directly smooth both sides, &c. with the back of a spade evenly, thereby fixing and closing the surface of the dung upon the spawn; and the bed is then ready for earthing, to be laid one or two inches thick evenly over the whole, as below.

But, sometimes, in a bed of considerable extent, which retains the great heat longer than one of smaller dimensions in length, &c. it may appear necessary to delay the earthing several days, or a week, or more, after being spawned, when doubtful of its renewing any violent heat, if immediately cased over closely with the requisite coat of earth, which confining the heat and steam more internally, and excluding the outward air, whereby a strong after-heat may probably occur; on which consideration, must observe proper precaution, still continuing the trying-sticks, to assist your observations on the occasion; and let the earthing be performed accordingly.

The proper earth for the purpose of earthing the bed, after being spawned as above, should be some good, rich, mellow garden earth, of a kitchen garden, moderately light and dry; or where that of a light, mellow, loamy nature occurs, either alone or mixed with other rich good earth, it will prove of greater advantage in promoting the superior production of the mushrooms in size and substance. Let the allotted earth be well broken small with the spade, free from clods and stones; then begin the casing, or coat of earth, first along the bottom of the bed, about an inch and half to two inches thick, continuing it the same thickness regularly up the sides quite to the top of the bed, beating it lightly down with the back of the spade in laying it on; thereby fixing it properly in its place even and smooth; proceeding thus regularly over each side, both ends, and the top, smoothing the whole in a neat manner. Then, after the bed is thus earthed over, the whole must be defended with a thick covering of clean dry straw, or long dry stable litter, as hereafter directed, after explaining the different methods of spawning.

2. *Spawning on the surface.*—This often proves a very successful method to obtain a forward and plentiful production, as the spawn, if plenty, may be laid tolerably close together, over the surface of the dung, and earthed over two inches, as follows:

Begin the spawning close down along the bottom, in a row longitudinally; placing the pieces of spawn flat-ways upon the dung, closer or wider asunder, according to the supply thereof more or less; earth this over two inches thick, and about six or eight inches up the bed the same thickness: then proceeding with

with another layer upward, laying the spawn, as above, upon the dung, close along the upper edge of the first covering of earth, which supports it from slipping down, so earthing this row over as the preceding, and then another course of spawn in the same manner earthed as the other; and thus proceed upward along both sides and ends, regularly to the top of the bed.

3. *Spawning in the earth.*—This is effected by having the bed first earthed over, and the spawn then inserted into the earth.

The bed to be earthed all over, evenly in every part, about two inches thick; the lumps of spawn being divided into moderately small pieces, proceed to plant them into the earth, inserting them therein close down to the dung, at small distances, in a regular manner, equally over the bed, on both sides and ends from bottom to the top, as in the two foregoing methods; and, when thus finished the spawning, directly add a thin coat of fine earth, about an inch thick over the whole, smoothing it down light and evenly with the spade, which completes the business, only to be afterwards covered in proper time with straw litter, as in the following general directions for covering the bed, applicable to all the methods of spawning.

Covering the Bed, and General Care after Spawning.

The bed being now spawned in either of the foregoing methods, then, after observing the former-mentioned precautions, it must be covered with straw, a considerable thickness, to defend it effectually from the external air, and all inclement weather of rain, snow, and cold, in which the same method of covering is applicable in general, and may be applied, either directly or soon after the bed is spawned and finally earthed over, if the heat is then quite moderate; or otherwise, if thought that immediate covering would occasion a renewal of too fierce heat, it may be deferred a few days, or a week or more, if dry mild weather; in which interval, if a bed of considerable substance in length, &c. it may be advisable, as soon as spawned and closely earthed over, to place down some of the long, sharp-pointed sticks, before-mentioned, into the bed, for occasionally trying the internal state of the heat, in order the better to discover when to apply the requisite covering of litter finally; observing, however, to be careful in performing the covering in proper time, either at first or afterwards, as soon as discovered that there is no danger of over heat, especially if unfavourable weather, heavy rains, &c. that the spawn may be well defended from excessive wet, and preserved always moderately dry; as too great

humidity, as well as extreme heat of the bed, and penetrating cold, would exterminate its vegetative powers.

For the purpose of covering, provide either clean straw, or long, dry stable litter; and of either of which have a sufficiency to lay about half a foot thick at first, but gradually increased afterwards to double that thickness, to defend the bed effectually from the outward air and all inclement weather, and to preserve a kindly growing warmth therein. Shake the covering on lightly and regular, quite from the bottom, up both sides and ends, and over the top, an equal thickness as above, and this to remain constantly day and night: it would also be proper in very rainy weather, and likewise all winter, to spread some large thick garden mats all over the straw covering, which will both secure it the better from being displaced by the wind, and will shoot off much of the falling wet of rain and snow, before it penetrates greatly to wet the covering of straw considerably, or get through to the bed, where it would prove very injurious to the spawn.

Thus the covering of straw is always to remain as before observed; only be careful to examine it occasionally after great rains and snow; and if they have at any time penetrated very much through the covering, so that the litter next the bed is considerably wet, that part of it should be removed as soon as possible, and dry straw applied in its place next the bed.

During the winter season, in very severe or bad weather, or heavy incessant rains, should augment the covering both of straw-litter and mats, the more effectually to resist penetrating cold and wet, so as to preserve the bed always comfortably dry and warm.

Never expose the bed, but very little, to the full air, especially in cold weather, except just to gather the produce; or occasionally, when it has received too much wet, in order to dry the surface for an hour or two in a dry mild day; or to remove casual wet or decayed litter next the bed, till fresh is added in its stead; or sometimes in fine warm weather, in spring and summer, to have the benefit of a very gentle warm shower for a short time: and in all of which to be directly covered over again with the dry litter, &c.

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After the bed has been spawned and covered in about a month, or five or six weeks, the first production will generally begin to appear, if the bed and spawn works kindly, though sometimes it will be longer: however, generally, in about three or four weeks begin to examine the

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But, sometimes, in a bed of considerable extent, which retains the great heat longer than one of smaller dimensions in length, &c. it may appear necessary to delay the earthing several days, or a week, or more, after being spawned, when doubtful of its renewing any violent heat, if immediately cased over closely with the requisite coat of earth, which confining the heat and steam more internally, and excluding the outward air, whereby a strong after-heat may probably occur; on which consideration, must observe proper precaution, still continuing the trying-sticks, to assist your observations on the occasion; and let the earthing be performed accordingly.

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The bed to be earthed all over, evenly in every part, about two inches thick; the lumps of spawn being divided into moderately small pieces, proceed to plant them into the earth, inserting them therein close down to the dung, at small distances, in a regular manner, equally over the bed, on both sides and ends from bottom to the top, as in the two foregoing methods; and, when thus finished the spawning, directly add a thin coat of fine earth, about an inch thick over the whole, smoothing it down light and evenly with the spade, which completes the business, only to be afterwards covered in proper time with straw litter, as in the following general directions for covering the bed, applicable to all the methods of spawning.

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humidity, as well as extreme heat of the bed, and penetrating cold, would exterminate its vegetative powers.

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Thus the covering of straw is always to remain as before observed; only be careful to examine it occasionally after great rains and snow; and if they have at any time penetrated very much through the covering, so that the litter next the bed is considerably wet, that part of it should be removed as soon as possible, and dry straw applied in its place next the bed.

During the winter season, in very severe or bad weather, or heavy incessant rains, should augment the covering both of straw-litter and mats, the more effectually to resist penetrating cold and wet, so as to preserve the bed always comfortably dry and warm.

Never expose the bed, but very little, to the full air, especially in cold weather, except just to gather the produce; or occasionally, when it has received too much wet, in order to dry the surface for an hour or two in a dry mild day; or to remove casual wet or decayed litter next the bed, till fresh is added in its stead; or sometimes in fine warm weather, in spring and summer, to have the benefit of a very gentle warm shower for a short time: and in all of which to be directly covered over again with the dry litter, &c.

Gathering the Produce, and Care of the Bed while in Production.

After the bed has been spawned and covered in about a month, or five or six weeks, the first production will generally begin to appear, if the bed and spawn works kindly, though sometimes it will be longer: however, generally, in about three or four weeks begin to examine the

the progress, turning up some of the covering, and if successful, you will discover the running and knitting of the spawn abundantly; and, probably, some mushrooms advanced to a proper size for gathering: and, by the above appearances, may soon expect a plentiful production all over the bed, which should be gathered according as they attain proper growth.

In proceeding to gather the mushrooms in the beds, generally chuse dry weather, especially during the cold seasons, when turn off the covering from one side of the bed first; but, if mild warm weather, may uncover the whole at once: then, looking carefully over the surface, gather all that appear above the size of middling round buttons, to full growth; detaching them with a gentle twist of the hand, head and stem together, quite to the bottom; being careful in this not to disturb the younger growths advancing in succession just within and above the surface of the earth: for it should be observed, in gathering, not to cut them off, leaving the stump in the bed, which would rot, become maggoty, and detrimentally infect the succeeding young plants: nor, in gathering, should any be permitted to remain to become very large flaps of a decaying state, but the whole generally gathered while of a close, firm, fleshy nature. As soon as finished gathering, let the bed be directly covered over again with the litter and mats.

The bed thus advanced to production, it will probably afford two or three successional gatherings weekly, while in its full perfection, for six or eight weeks, often rising all over the bed, in different degrees of growth, one under another; though, sometimes, a bed will continue double that time in tolerable good bearing, or even four, five, or six months; but, probably, the produce not so quick and abundant as in the more early state of the bed; however, generally examine it once or twice a week as long as it is expected to yield a supply of mushrooms more or less for gathering.

The autumn-made beds generally produce mushrooms in a shorter time, and more abundant than those of any other season.

But as sometimes it happens that a mushroom bed remains dormant several months after it is spawned, without affording any production; if, upon examination, the spawn appears in life and vigour, extended its fibres, and smells well, it should not be too hastily disturbed, as, in that case, it often breaks forth into activity all at once as it were, and furnishes considerable crops; or to assist such beds, when discovering that long dormant state, if the heat appears greatly or quite declined, it would be proper to apply a sort of lining of

warm stable litter over the whole, having first a thin spreading of dry long litter immediately next the bed; then shake the warm litter a foot thick over that, which by its kindly warmth will revive the inactive spawn into a state of vegetation. And as sometimes, in very cold weather, a bed in production, not naturally worn out, will suddenly decline, probably for want of some degree of warmth; which may try to recover by applying warm long litter as above.

After excessive rains, &c. if the general covering of straw is rendered very wet, penetrated considerably through to the bed, turn it off as soon as possible in a dry day, applying dry next the bed.

In summer, when any beds are in production, if very hot weather, and the earth of the beds very dry, it may be proper occasionally to open them, and give a moderate sprinkling of water; or sometimes to partake of the benefit of a very moderate shower of rain for a short time, and covered up again.

Likewise observe, that in beds of any considerable time standing, if any of the covering, by long lying thereon, decays or becomes dung, it should be removed, and fresh applied in proportion.

Thus far concludes the general care of a mushroom bed in production; and by which it will sometimes continue producing several months, but seldom furnishes equal abundance after the first eight, ten, or twelve weeks; though some beds remain in production for near half a year; so should remain undisturbed as long as it continues yielding a tolerable supply of good heads; and, when wholly declined, the dung proves excellent manure; and the interior part sometimes furnishes some good fresh spawn, which should be preserved.

Of some other different Methods occasionally practised in raising Mushrooms.

Sometimes a mushroom bed is made under cover of a long range of glass-framing erection, either in the manner of a hot-house, or the top sloped both ways like the roof of an house, both slopes being of glass work; and in which the bed is made, spawned, and covered with straw litter, as in the common method; and being thus protected from the outward air, and defended effectually from all injuries of excessive rains, snow, and more securely from frost and cutting weather, and being always dry and warm, often proves very successful.—Likewise in a similar glass-case, in which there is a pit like that of a hot-house, a bed is made in the said pit in the manner of a common hot-bed, raised at top a little above the pit in a rounding form, and on which the spawn is placed,

placed, earthed over and covered thick with straw.

And sometimes in the same kind of glass case, having a pit within, a bed is made in the pit, of dung and earth mixed together, the bed finished rounding at top, or somewhat ridge-form, and without spawning, in order to generate the spawn naturally in its peculiar way; having, for this occasion, plenty of horse-dung, and short moist stable litter, mixed with a quantity of fresh light surface loam, and other rich earth; mixing the whole together, and worked into the pit, as above; thinly earthed over at top, and covered with long litter; and, when the spawn is formed, will produce mushrooms in long continuance.

Also a mushroom bed in the common method is sometimes made in a long covered shed; or under an awning supported on posts, and covered at top from rain, &c. so as to preserve the bed always dry.

Sometimes a mushroom bed is formed in the same manner as a common hot-bed in the open ground, finishing the top in a rounding form, then defended with frames and glasses; and when the heat is reduced to a low state, is spawned on the rounded top surface, earthed over, and covered in with dry litter, or preferable if with dry hay; and put on the glasses; and when very cold, or excessive wet weather, defend the outsides of the bed, and that of the frame, with long litter laid a tolerable thickness, and covering the glasses in time of rigorous frosts.

Having sometimes, in the latter end of autumn, or early in winter, on examining some decayed melon and cucumber hot-beds, and removing the top earth, discovered a large production of fine strong spawn, overspreading the surface of the dung, and running in the mould or earth, which was a good light rich loam; so, taking off a little of the upper part of the earth, permitted the whole to remain, covered the top surface with dry clean hay, six or eight inches, and set on the frame and glasses; remaining thus till spring, February and March, when a crop of mushrooms began to appear in a singularly abundant production, advancing crowdedly one under another in clusters, and with most large, thick, fleshy heads.

In late-made cucumber and melon hot-beds, for the general summer and autumn crops, if, when the heat is become very moderate, about May, June, or beginning of July, pieces of spawn are inserted along the top edge, about two inches under the mould, covering the places with a little dung litter, will often produce good mushrooms in autumn.

It may be observed, in the culture of mushrooms, they are generally very prosperous in

light, rich, loamy earth, commonly large, and the heads thick and fleshy.

AGAVE. Great American Aloe, or Agave.

This is the genus of aloes, of which the common opinion prevails that the plants do not flower until they are a hundred years old. They are herbaceous, evergreen perennials of the succulent tribe, mostly of very considerable growth: exotics of the temperature of the greenhouse and stove departments, and retained by the curious as plants of singularity.

The *Agave* belongs to the class and order *Hexandria Monogynia*.

Characters.] **CALYX**, none. **COROLLA**, one large funnel-shaped petal, divided at the brim into six segments. **STAMINA**, six long filaments with narrow antheræ. **PISTILLUM**, an oblong germen placed below the corolla, supporting a long style, having a three-cornered stigma. **PERICARPIUM**, the germen becomes an oblong triangular capsule of three cells, pregnant with compressed seeds.

There are eight or ten species; those of most note are,

1. *AGAVE americana*.

Common great American Agave.] Agave with large widely indented leaves, all the denticles ending in a sharp spine, and branching flower stem.

Varieties.] Common American Agave with gold striped leaves.—Common American Agave with silver striped leaves.

2. *AGAVE virginiana*.

Great Virginian Agave.] Agave with large widely indented spinous leaves, and simple flower stem.

3. *AGAVE lurida*.

Veracruzian broad-leaved Agave.] Agave with large closely indented leaves, all the denticles armed with black spines.

Variety—Agave rigida.] Rigid narrow-leaved Veracruzian Agave with very narrow stiff entire leaves, terminated by a black spine.

4. *AGAVE vivipara*.

Viviparous, or Childing Agave.] Agave with reflexed slightly indented leaves, and with young plants succeeding the flowers.

5. *AGAVE fœtida*.

Stinking Childing Agave.] Agave with narrow stiff entire leaves, and with young plants succeeding the flowers.

All the species are natives of America: the first two, and varieties, grow freely here, indulged with the shelter of any common greenhouse in winter; but the other three sorts succeed best in a moderate stove during that season.

These plants in general are herbaceous, perennial, succulent, and evergreen, and of large and singular growth, consisting entirely of very long, erect, thick, fleshy leaves, the same

same leaves continuing many years: and all the species have this singularity,—they never flower but once, which is rarely till they are upward of fifty, and frequently sixty, or near an hundred years old, when the flower stem is of such amazing rapidity of growth, as in one season to attain the height of twenty or thirty feet, supporting an enormous pyramid of numerous liliaceous flowers, continuing sometimes several months; after which succeeds the dissolution of the whole plant; stem, leaves, and root, totally perish.

The roots of all the sorts are thick, fleshy, and fibrous, sending forth innumerable small fibres every way.

The plants are mostly acaulous, having no stalk or trunk to elevate the leaves, they rising immediately from the crown of the root in a vast cluster, and attain considerable length and substance, grow erect, and embrace one another at the base; those of the centre are closely enveloped from bottom to top, which, in different species, obtain different heights, from eighteen inches to six or eight feet, and from one to six or eight inches in breadth, and three or four thick, decreasing gradually in substance to the extremity, where they terminate in a thorny point; and from between the centre leaves is produced the flower stem, which rises from fifteen to twenty-five or thirty feet high; in most species branching out on every side pyramidally, and all the numerous shoots closely adorned with considerable clusters of yellowish flowers growing erect, the whole assuming a beautiful pyramidal form, of a singularly grand appearance, continuing two, three, or four months, if protected from cold; and when the flowers fade, they in some are succeeded by seed, in others, instead of seed, by young plants, in the place of proper seed vessels.

The seed, however, never comes to maturity in England, but the young plants attain it fully.

The first, second, and third species, and varieties, obtain considerably the largest growth, their leaves often growing five or six feet high and upward, particularly the two former; the second is distinguishable from the first by the leaves being of a paler green, and much narrower upward; and the third from both these by the leaves being broad, thinner, and the indentings on the edges more frequent and slight, and the armature or spines very black.

The *Common great Agave*, and *Agave virginiana*, have flowered frequently in many parts of England; the stem of the former always branches pyramidally; and that of the latter is simple, and supports its flowers entirely at its summit in a vast cluster.

The two varieties of the *Common Agave*

with striped leaves are plants of singular beauty, and merit particular attention.

The third species, *Agave lurida*, and variety, are of more moderate growth; the leaves thinner, though broader in the principal species; and in the variety very narrow, not exceeding an inch and half or two inches in breadth, and a foot and half to two and a half in length: rigid, stiff, and entire; the outward ones spreading horizontally.

The fourth and fifth sorts, *Agave vivipara* and *fætida*, have great singularity, that in the former, though the plant itself rarely exceeds eighteen inches or two feet, it produces a flower stem ten or twelve feet high, and in the latter, though it is seldom more than a yard high in the leaves, the flower stem often attains six or seven times that height; and what is still as remarkable, the flowers, instead of being succeeded by proper seed vessels, are productive of young plants: hence they derive the name Childing Aloe.

Both these have flowered in England, and the former produced numbers of young plants on their flower stems as above, which being planted, readily grow.

Of the flowering of all these plants, it is the common opinion that they do not effect it until they attain the age of a century; the time of their flowering however is not limited, but depends upon the growth of the plant, which is particularly affected by heat and cold; for as the flower stem being produced from the centre of the leaves, and these closely embrace one another, it is evident, that until they are fully expanded, the bud of the stem is not at liberty to advance; and in this climate, by reason of cold, the growth of the plants being remarkably slow, it is often near an hundred years before they effect that expansion; when the stem however begins to appear and advance, it makes surprising progress, as in the space of three or four months it acquires its full stature.

Propagation and Culture.

The first and second species and varieties are productive of abundant off-sets or suckers from their base, by which they may be propagated with great facility. These suckers may be taken off any time in summer, and planted singly in small pots of light sandy earth; give a little water, and they will take root freely without trouble.

The third and fourth being sparingly productive of suckers, they, in default of which, may be increased by planting pieces of their large roots in pots, and plunge them in a moderate hot-bed, they will put forth fibres in the earth, and shoots above, and form proper plants

plants in three months: though the fourth and fifth sorts are generally more sparing of suckers than any of the former, but in lieu of which they produce young plants on their lofty flower-stems; but until they flower, those cannot be obtained: their propagation therefore may also be tried by pieces of the root and leaves as above.

It is to be remarked, that, in respect to soil, all the sorts require a dry light sandy earth, because the plants themselves being very succulent and humid, a soil that retained moisture would rot the roots in winter.

With respect to their general culture, they must always be retained in pots or tubs. The first, second, and third sorts, and varieties, succeed in the full air from May until the end of October, when they should be placed in the green-house; but the fourth, and fifth sorts are of the most prosperous growth when they have the constant protection of a stove. And it is to be particularly observed, that as all these plants are extremely succulent and replete with moisture, they require very little water in winter, particularly those in the green-house; but in hot dry weather in summer, should have moderate waterings twice a week.

According as the plants advance in growth, they should be indulged with larger pots, but never any too large, except the great sorts, which, when they attain a large size, should be shifted into tubs for the convenience of moving them. See SHIFTING PLANTS.

It is necessary to shift all the sorts once in two years at least into fresh earth. See SHIFTING PLANTS.

When the plants make an effort for flowering, it is discoverable by the centre leaves expanding, and the bud of the future stem appearing, which, if it do not advance freely, it may be forwarded by artificial heat; a wide deep trench or pit filled with hot dung or tanner's bark, or a mixture of both, raising it two or three feet; into which plunge the pot or tub, containing the plant, and supply it with water, observing, if the plant is at this time in any place of shelter, way must be made upward, if necessary, for the stem to advance; and if the weather is cold, it must not be exposed; so that a temporary awning should be erected to shield it occasionally.

As some of these plants acquire a very considerable size, and take up much room in a green-house, and being troublesome to move, a few should only be cultivated to grow large.

Sometimes the great sorts grow so very large and weighty before they arrive at a flowering state, that the tubs containing them

are obliged to be fixed upon strong frames with low wheels, for the convenience of moving them out and into the green-house.

The following are the other less common species of Agave; tenderer kinds for the stove.

1. AGAVE *Karrata*.] Karrata Agave with narrower erect dark-green leaves, edged with brown, and slightly sawed.

2. AGAVE *Tuberosa*.] Tuberous-rooted Agave with long narrow indented spinous edged leaves.

3. AGAVE *Serrata*.] Serrated green Agave.

AGGREGATUS, *Flos*. An Aggregate Flower.] This consists of a number of smaller flowers or florets, collected into one head by means of some part common to the whole, such as one common receptacle and calyx or cup; that in the proper aggregate flower each separate floret or fructification is erected on a short foot-stalk, standing on the receptacle or base, which is extended in breadth for that purpose; and in many aggregate flowers, the florets, besides the common calyx, are each furnished with a proper cup.

From the different structures, disposition and other circumstances of these common parts, the receptacle and calyx, arises a seven-fold division of aggregate flowers, viz.

1. The AGGREGATE Flower, properly so called; such as scabious, globularia, cephalanthus, thrift, &c.

2. The COMPOUND Flower; such as sunflower, marigold, African marigold, milfoil, eupatorium, &c. See COMPOSITUS *Flos*.

3. The UMBELLATE Flower; such as fennel-giant, bupleurum or hare's-ear, eryngium, parsley, angelica, lovage, &c. See UMBELLATÆ.

4. The CORYMBUS Flower, as in *Spiræa opulifolia*. See CORYMBUS.

5. The CYMOSE Flower; such as honeysuckle, Guelder-rose, laurustinus, elder, &c. See CYMA.

6. The AMENTACEOUS Flower or Catkin; such as that of the pine-tree, poplar, beech, birch, walnut, cypress, hazel, willow, &c. See AMENTACEOUS FLOWER.

7. The GLUMOSE Flower; such as that of wheat, oats, reed, Turkey wheat, and all the grasses. See GLUME.

8. The SPADICEOUS Flower, protruding their heads of flowers from a spatha or sheath; such as the narcissus, amaryllis, colchicum, snow-drop, asphodel lily, blood flower, sea-daffodil or paneratum, garlick, onion, leek, &c. See SPADICEUS, SPADIX, &c.

For a particular description of each of the

above species of aggregate flowers, see each in its proper place.

AGRIMONIA, Agrimony.

This genus furnishes ~~five~~ herbaceous perennials, that obtain from eighteen inches to three feet stature; two or three proper for ornament, the others for medical purposes.

Class and order. *Dodecandria Digynia*.

Characters.] CALYX, one-leaved, cut into five acute parts, and sits on the germen. COROLLA, five plane petals inserted into the calyx. STAMINA, twelve filaments with double antheræ. PISTILLUM, a germen placed under the flower, supporting a double style. PERICARPIUM, the germen becomes two roundish seeds attached to the calyx.

The species are,

1. **AGRIMONIA Eupatoria.**

Common officinal Agrimony.] Agrimony with winged cauline leaves, having small sawed lobes and rough seed.

2. **AGRIMONIA repens.**

Creeping-rooted Eastern Agrimony.] Agrimony with thick creeping roots, winged, cauline leaves, having narrow lobes, short spikes, and hairy seeds.

3. **AGRIMONIA odorata.**

Odoriferous Agrimony.] Tallest Agrimony with pinnated cauline leaves, having many oblong sharply-sawed lobes.

4. **AGRIMONIA Agrimonoides.**

Three-leaved Agrimony.] Agrimony with cauline leaves, having three lobes, and smooth seed.

The plants have fibrous roots, which are perennial, from which arise several branching leafy stalks annually in spring, and decay in autumn, after they have flowered and perfected seed.

The first sort grows wild in woods and uncultivated shady places, but is retained sometimes in gardens as a medicinal herb.

The stalks of the second sort rise near two feet high: the third, double that height; and the fourth, near a yard; and the stalks of each sort are branching, and closely adorned with small winged leaves, and terminated by spikes of flowers. The third sort is in much esteem for the odoriferous property of its leaves and flowers. All the three species may be retained as furniture for common borders, and such places where many plants of easy culture are required, as they succeed in any exposure, and will effect an agreeable diversity in assemblage.

The propagation of all the sorts is effected by seed, and by parting the roots in autumn, or early in spring: but as they multiply ex-

ceedingly by roots, that is the most expeditious method.

AGROSTEMMA, Wild Lychnis or Campion, Rose Campion.

The plants are hardy herbaceous annuals, and biennial-perennials: consisting of three or four species, one of which produce beautiful flowers; the others have no merit.

Class and order, *Decandria Pentagynia*, ten stamina, five styles.

Characters.] CALYX, monophyllous, tubular, five-parted at the brim, and permanent. COROLLA, five broad expanded petals. STAMINA, ten filaments, five of which are inserted alternately into the base of the petals. PISTILLUM, an oval germen, five styles, having each a single stigma. PERICARPIUM, an oval capsule of one cell, having five divisions pregnant with seeds.

The species and its varieties are,

AGROSTEMMA coronaria.

Common Rose Campion.] Agrostemma with ovate-spear-shaped, woolly leaves, and coronated undivided petals.

Varieties.] Single Rose Campion with pale red flowers.—Single Rose Campion with deep red flowers.—Single Rose Campion with white flowers.—Single Rose Campion with white and red flowers.—Double Rose Campion with a large crimson flower.

All the above varieties are extremely hardy fibrous-rooted biennial-perennials, that succeed in any common soil of a garden, and are of easy culture.

They grow eighteen inches or two feet high; the leaves are hoary and whitish, and rise from the root in a great tuft, and remain all the year; and from the centre is produced the flower-stem annually in the spring, which rarely exceeds two feet stature, divides into many branches, all of which are terminated by the flowers in July and August, which, in the single kinds, are succeeded by numerous seeds, but the double sort produce none.

The flowers of the common single kinds have only five petals, but those of the double sort are numerous, even to the exclusion of the parts of fructification, so that they consequently produce no seed.

The Double Rose Campion is a most elegant flower, and the single kinds, though of inferior beauty, form a pretty variety.

The single kinds rise plentifully from seed sown in a bed of common earth, in spring or autumn; when the plants are two or three inches high, prick them into another bed or border, six inches distance, giving occasional watering; and in autumn or spring following transplant them into the borders for flowering,

ing, which they will effect the ensuing summer.

As the old plants are apt to grow straggling, and being somewhat of a biennial nature, it is proper to raise a supply of young ones every year or two.

They also rise plentifully from scattered seeds.

The double sort, producing no seed, can only be propagated by parting the roots: they generally afford plenty of off-sets, which should be parted in autumn as soon as the flower is past; plant them in a bed of common earth, six inches a-part, to remain until spring; then transplant them where they are to flower.

Some plants may with propriety be cultivated in pots, to adorn court-yards, &c.

AILANTHUS, consists of a hardy Chinese tree garnished with winged leaves and polygamious flowers.

Class and order, *Polygamia Monœcia*.

Characters.] Male, female, and hermaphrodite flowers, on the same plant. **MALE CALYX**, a small five-parted monophyllous cup. **COROLLA**, five spear-shaped acute petals, convolute and spreading at the base. **STAMINA**, ten compressed filaments, with oblong versatile antheræ. The Female Flower, **CALYX** and **COROLLA** as the male. **PISTILLUM**, three or five incurved germina. Style lateral. **PERICARPIUM**, three or five membranaceous compressed capsules formed of the germina, each containing a hard seed. **HERMAPHRODITE** flower as the male, having two or three stamina.

We know but one species,

AILANTHUS glandulosa.

Glandulous Chinese Rhus or Sumach.] Rises with a straight stem thirty or forty feet high, branching out and garnished with large winged leaves, consisting of several pairs of oblong pointed lobes, roundish at their base, and dented; the denticles glandulous underneath. The flowers are white, and come out in spikes at the ends of the branches.

This tree is easily propagated by young plants, which frequently arise from the roots which are near the surface of the ground, or by turning up some of the roots after being cut asunder. These may be taken up in the spring, and planted in the nursery for two or three years, and then transplanted out where they are intended to remain.

AIR. In vegetation, air, heat, and water, are its principal agents. Air abounds with vegetable substances, necessary to the growth and welfare of all seeds and plants; and it has been proved by numerous experiments, that

without a certain portion of Air, no seeds can germinate, nor plants grow freely, nor seeds and fruits attain due perfection.

Air enters into the bowels of the earth to a certain depth; thence into the pores of seeds, roots, and veins of the very trees and herbs, carrying along with it those vegetable substances contained either in itself or lodged in the earth; and even enters through the bark and body of the trees, and materially affects their branches, leaves, flowers, and fruit.

The humidity of the Air alone often makes many sorts of seeds rise, and roots and plants shoot, that are exposed to it; seeds and plants too are often observed to vegetate in water, without the intervention of earth; but either of these without Air is insufficient. Many succulent plants, by the assistance of Air only, will retain their growing quality several months; and some sorts of aloes will live without earth and water some years, if secured from frost, particularly exemplified in the *Aloe barbadensis*: and the branches of some sorts of *Sedum* and *Sempervivum*, being cut off in summer and exposed to the Air, have been observed to emit roots without the aid of earth and water, and live several months; the *Sempervivum arboreum* particularly furnishes examples.

Air in a certain degree is most necessary to preserve the vegetative faculty of seeds, previous to their being committed to the earth; as for example, if seeds are put into phials or bottles, close stopped, and sealed down, and retained therein several months, they, for want of air to nourish and preserve health in the germ, lose their germinating quality.

Thus, for want of a due portion of Air, seeds which are buried to too great a depth in the earth, either thrive but indifferently, or do not grow at all.

They frequently preserve, however, their germinating virtue for many years in the bowels of the earth; and it is not unusual, upon a piece of ground being newly dug to a considerable depth, to observe it soon after covered with plants, which had not been seen there in the memory of man. How the vegetative property is so long maintained in seeds so deeply immersed in the ground, is hard to account for; but certain it is, that there have been instances of seeds having been buried several feet deep upwards of thirty years, and when turned up again to the full air, they germinated like new seeds: and soil that has been taken out of the bottom of wells, vaults, and sewers, and spread in the Air, has produced many unknown weeds or plants.

It is observable of trees and plants, whose roots are planted a considerable depth, that being out of the reach of the proper influence of Air, sun, and showers, they do not prosper.

The same is also very obvious in plants growing in garden-frames under glasses, and in green-houses and stoves: if they are kept too close they do not prosper; and if deprived of a proper current of Air, they draw up feeble, become meagre, dwindle, and die before their usual time. Great attention ought therefore to be at all opportunities observed, to admit the fresh Air to plants retained in those departments. Common hardy plants, that require only protection of frames from frost in winter, should be fully exposed every mild day, by taking off the covers; those of tender quality, that need artificial heat, and continual shelter of frames and glasses, such as early cucumbers, melons, and tender annuals, &c. although they are unable to endure the full Air till June, should be indulged with a due portion thereof every day, even in frosty weather, if there is heat in the beds; which is effected by railing on props one end of the lights, from half an inch to three in height, according to the temperature of the beds, and that of the outward Air. Green-house plants, during the winter season, should be allowed free Air every mild calm day, by opening the windows less or more: and stove plants should also have the indulgence of fresh Air in mild, sunny, calm days; even occasionally in winter, when the sun shines warmly.

Plants in general prosper best where they enjoy the full Air in as great a degree as their respective temperaments will admit. All hardy kitchen-garden vegetables attain the greatest perfection in a free exposure: as for example, if peas, beans, cabbages, &c. are planted under spreading trees, or in any close or shady place where they are deprived of a proper current of Air, they draw up weak without taking the proper consistence, and do not attain half the perfection, either in quantity or quality, as those that are more exposed.

Fruit likewise, that are produced in orchards where the trees and branches are so crowded as to exclude the proper circulation of Air, never attain due perfection, either in size, colour, or relish.

AITONIA, an elegant green-house shrub: only one species is known at present.

Class and order, *Monadelphica Oëlandria*.

Characters.] CALYX, erect, of one leaf cut in four parts, the edges oval and pointed. COROLLA, four erect petals, oval, concave, and reflexed. STAMINA, eight subulate fila-

ments, joined half their length, the upper parts loosed from each other, and topped with ovate furrowed antheræ. PISTILLUM, an oval, smooth, subangulated germen; style slender and topped with a blunt stigma. PERICARPIUM, an ovate quadrangular dry berry, with cells containing many smooth round seeds.

The species is,

AITONIA capensis.

Cape Aitonia.] Hath a shrubby stalk garnished with spear-shaped leaves, about an inch and a half long, several issuing from each joint; from among these the flowers proceed, tinged toward their extremities with a pink colour; these are succeeded by a large dry angular berry, of a fine red colour. The whole is of slow growth, rarely exceeding three feet in height, producing, when of sufficient age, flowers and fruit through most part of the year.

Propagation.] By seeds, which are sparingly produced in this country: they may be sown in pots of rich earth and plunged in a moderate hot-bed, and afterward managed as other green-house plants of the same nature.

AJUGA, Bugula, or Bugle.

The plants are herbaceous perennials, of the ornamental kind, of stature from six to twelve inches, adorned at top with many flowers collected into whorled spikes.

Class and order, *Didynamia Gymnospermia*.

Characters.] CALYX is one-leaved, cut into five segments. COROLLA, monopetalous, tubular, and labiated, the tube long and incurved, the upper lip short and bifid, the under one large, and three-parted. STAMINA, two short, and two long filaments, and double antheræ. PISTILLUM, four-parted germina elevating one style, having two stigmas. PERICARPIUM, none; four seeds lodged in the calyx.

There are seven or eight species: those that demand notice are,

1. *AJUGA reptans.*

Creeping common blue Bugle.] Bugle with obovate crenated leaves, half embracing the stalk, creeping side-shoots emitting roots, and blue flowers.

Varieties.] Common Bugle with purple flowers.—Common Bugle with white flowers.

2. *AJUGA decumbens.*

Declinated Alpine Bugle.] Bugle with oblong oval leaves, reclining stalks, and the whorls of flowers remote.

3. *AJUGA pyramidalis.*

Pyramidal blue Bugle.] Bugle with a simple stalk, oval bluntly indented leaves, and close pyramidal blue spike.

Varieties.] Pyramidal red Bugle.—Pyramidal white Bugle.

4. *AJUGA*

4. *AJUGA genevensis*.

Geneva Bugle.] Bugle with oblong woolly leaves, hairy calyx, and flesh-coloured flowers.

Variety.] Geneva white Bugle.

5. *AJUGA orientalis*.

Eastern inverted white Bugle.] Bugle with oval, indented, hairy, close-fitting leaves, and inverted white flowers.

Variety.] Eastern inverted blue Bugle.

They are all of humble growth, the roots fibrous and creeping; the stalks rise from six to twelve inches high, emitting trailing, rooting shoots, and decorated with small, simple, ovate leaves below, and many small flowers upward, collected into whorls round the stalk, in some forming a close spike.

They flower early in summer, and yield plenty of seed.

The *Common Bugle* grows naturally in woods in England, the next three on the Continent, and the fifth in the Levant.

The former four succeed in any common shady border, the fifth should be potted and shielded from frost.

The propagation of all the sorts is by off-sets, or side-shoots, which root in the earth, and may be separated at any time, or may be raised from seed.

ALATERNUS. See RHAMNUS.

ALBUCA, Bastard Star of Bethlehem.

This genus furnishes two species of bulbous-rooted herbaceous perennials, of the flowery tribe, whose flower-stalks rise from eight to fifteen inches high.

Class and order, *Hexandria Monogynia*.

Characters.] CALYX, none. COROLLA, six oblong oval petals, three of which expand, and three standing inward and connected. STAMINA, six long trigonous filaments, three of which are alternately castrated, the others are crowned with moveable antheræ. PISTILLUM, an oblong triangular germen and style, surmounted by a conic triangular stigma. PERICARPIMUM, the germen ripens to a three-cornered capsule of three cells, containing many small seeds.

The species are,

1. *ALBUCA altissima*.] Tallest African Albuca, with long tubulate channel-convolute leaves.

2. *ALBUCA major*.] Greatest African Albuca, with spear-shaped leaves.

3. *ALBUCA minor*.] Least African Albuca, with narrow awl-shaped leaves.

All these species have moderately large bulbous roots, from which the leaves and flower-stem rise annually; the leaves rise first, which are long and narrow, and the stem rises in the centre of them, ornamented with white

and red flowers of the liliaceous tribe, appearing towards autumn, but rarely ripen seeds in England.

The *Albuca altissima* grows two feet high or more, producing a long racemous spike of many white flowers.

In the second species the stem rises twelve or fifteen inches high, decorated with many drooping red flowers, forming a loose spike.

The third grows eight or ten inches high, surmounted by a few erect yellow flowers, forming a sort of corymbus.

Both the species require protection from frost: so the roots should be retained always in pots, and placed in a frame in winter, to have occasional shelter.

Their propagation is by off-sets from the roots, when the flower is past in summer.

ALCEA, Hollyhock, or Rose Mallow.

This genus furnishes many curious varieties of hardy herbaceous perennials, of the flowery race, whose flower-stem obtains a lofty stature, adorned with numerous large and elegant rose-like flowers.

Class and order, *Monadelphia Polyandria*.

Characters.] CALYX, two monophyllous cups, the inner slightly five-parted, the outer six, and expands. COROLLA, five large expanded petals. STAMINA, numerous filaments united below with the styles like a column, and kidney-shaped antheræ. PISTILLUM, a round germen, a short style, many-parted at top, having as many stigmas. PERICARPIMUM, the germen ripens to a round, depressed, jointed capsule of many cells, each containing one seed.

There are only two distinct species, but of which are many beautiful varieties, of various colours, such as whites, all the tints of red and purple, and almost every degree of yellow; and of each variety there are single and double flowers.

The species and principal varieties are,

1. *ALCEA rosea*.

Common Hollyhock, or Rose Mallow.] Hollyhock with rounded and angularly sinuated leaves.

Varieties.] Hollyhock with white flowers. — Cream-coloured Hollyhock. — Flesh-coloured Hollyhock. — Red Hollyhock. — Flaming red Hollyhock. — Blackish red Hollyhock. — Purple Hollyhock. — Pale yellow Hollyhock. — Deep yellow Hollyhock. — Variegated Hollyhock.

2. *ALCEA Ficifolia*.

Fig-leaved or Palmated Hollyhock.] Hollyhock with palmated or hand-shaped leaves.

Varieties.] Several of different colours, as those of the former.

3. *ALCEA*

3. *ALCEA chinensis*.] Chinese dwarf Hollyhock, with beautiful variegated flowers—double and single.

The two first species and respective varieties are hardy perennials, that prosper in any common soil and situation; they are perennial in root, but the stalks are annual; they rising in spring attain six or eight feet stature, flower in July and August, perfect seeds in September, and the stems soon after perish.

The roots are fibrous, white, long and spreading, but not furnished with many small fibres.

The leaves are both radical and elevated on the stem, simple, and from three to eight or nine inches broad, the radical or root leaves rise in a great cluster.

The stem rises between the radical leaves, immediately from the root; is round, erect, and grows two or three yards high, ornamented on every side with leaves and flowers, forming a spike from three to five feet in length, the flowers making their first appearance when the stalk is about a yard high, and as that advances, furnishes a daily supply of more new flowers for six or eight weeks, which make a fine appearance.

All the varieties, both single and double, afford plenty of seed for propagation.

The flowers in their single state have but five petals, but those of the doubles are numerous, and the flower equal in bigness to the largest double Provence rose; in some, the outer petals are large and spreading, those within small, and form a globular body in the middle.

The Chinese Hollyhock grows about a yard high; it is annual-biennial; being raised from seed in the spring, it flowers the same year, and sometimes continues till the second.

Use in Gardens, Culture, &c.

All the varieties of these plants are very ornamental to the pleasure-ground, although they are often disregarded by the incurious; but we know very few herbaceous plants that equal them in beauty as garden flowers for ornament, especially when their tall stems are duly supported and trained in erect position.

The propagation of all the varieties is easily effected by seeds sown in a bed of common earth, in March or April; the plants appear in a few weeks, and will be fit to transplant in autumn.

The first year the plants produce only radical or root-leaves: the second, they shoot up their stalks, and flower.

In sowing these seeds, it is eligible, as they are pretty large, to draw flat shallow drills for their reception, half an inch deep, and six asunder; sow the seed thin and regular, rake

the earth over them, and trim the surface smooth: the plants will appear in a month; and in July, when they will have several leaves, transplant them into a nursery-bed, nine inches distance, and give occasional waterings for a fortnight.

In October, November, or spring following, transplant them into the borders and other open compartments of the pleasure-ground, shrubbery, &c.

We observed formerly that the plants are perennial in root; but we would be understood, that although the same individual continues many years, it never flowers so strong, nor are the flowers so large, double, and lively in colour, as the first and second year. Persons that are curious should therefore raise a supply annually from seed.

The Chinese Hollyhock is also raised from seed sown in March or April in a warm border or in a hot-bed, and planted out in May or June in the borders; or sown in patches in the borders to remain: the plants will flower the same year; and should be raised every spring from seed. See ANNUAL PLANTS.

ALCHEMILLA, Ladies-Mantle.

This genus contains several species of hardy herbaceous perennials, some of which merit culture for the singularity of their leaves, which are curiously scalloped, waved, and plaited.

Class and order, *Tetrandria Monogynia*.

Characters.] CALYX is monophyllous, eight-parted, spreading at the brim, and permanent. COROLLA, none. STAMINA, four filaments attached to the brim of the calyx, having yellow antheræ. PISTILLUM, an oval germen, long style, and globular stigma, and the germen ripens to a single seed.

The species are,

1. *ALCHEMILLA vulgaris.*

Common Ladies-Mantle.] Alchemilla with roundish, lobated, sawed leaves.

2. *ALCHEMILLA hybrida.*

Mongrel, Least Ladies-Mantle.] Alchemilla with roundish, lobated, plaited, sharply sawed, silvery leaves.

3. *ALCHEMILLA pentaphylla.*

Five-leaved simbricated Alchemilla.] Alchemilla with five-lobed leaves, the lobes finely cut like fringes.

4. *ALCHEMILLA alpina.*

Alpine digitate Alchemilla.] Alchemilla with digitate or fingered, hoary, sawed leaves.

All four species are hardy, fibrous-rooted, herbaceous perennials, that prosper in any common soil and exposure, have perennial roots, but the leaves and stalks are renewed annually.

The leaves are the principal merit of the plants,

plants, for purposes of ornament in gardens; they rise immediately from the root on long foot-stalks; those of the first and second are roundish, broad, and scalloped into several lobes, which are waved and plaited-folded: hence the plants derive the name Ladies-Mantle.

The flower-stem rises between the leaves, ten or fifteen inches high, very branching, having all the branches terminated by clusters of flowers, which being apetalous, make no figure.

The *Common Alchemilla*, second and third sorts, grow wild in meadows and mountainous places, and are admitted in gardens for variety.

The propagation of all the species is by parting the roots, and by seed sown in a shady border.

The *Alchemilla vulgaris* is a medicinal plant.

ALETRIS, Guinea Aloe, &c.

The plants of this genus are herbaceous, succulent evergreens, of the aloaceous tribe, natives of hot climates, and retained here in stoves for curiosity.

Class and order, *Hexandria Monogynia*, six stamina; one style.

Characters.] CALYX, none. COROLLA, one oblong oval liliaceous petal, six-parted at the brim. STAMINA, six long filaments inserted in the corolla. PISTILLUM, an oval germen. awl-shaped style, and trifid stigma. PERICARPIUM, a trigonous capsule of three cells, and angular seeds.

There are eight species; those of note are,

1. ALETRIS *hyacinthoides*.

Hyacinth-flowered Guinea Aletris.] Aletris without stalk, spear-shaped fleshy leaves, and flowers proceeding by pairs.

2. ALETRIS *zeylanica*.

Ceylon dwarf Aletris.] Aletris without stalk, and spear-shaped, plane, erect leaves.

3. ALETRIS *capensis*,

Cape undulate Aletris.] Aletris without stalk, spear-shaped undulate leaves, and oval spike of nodding flowers.

4. ALETRIS *fragrans*.

Fragrant stalky Aletris.] Aletris with an erect stalk, elevating a head of spear-shaped leaves, embracing it with their base.

5. ALETRIS *uvaria*.

Orange-flowered Aletris.] Aletris with an erect stalk, long narrow channeled leaves, and orange-coloured flowers in close spikes.

These plants have the appellation of aloe among gardeners, derived from their similarity of growth, particularly the two first, i. e. Guinea Aloe, and Ceylon Aloe.

The roots of all these plants are thick, fleshy, fibrous, and creeping.

The first three sorts are acaulous plants, i. e. having no stem nor foot-stalk to elevate the leaves, they rising immediately from the root, and without any visible foot-stalk of their own; are narrow, stiff, fleshy, and grow from six to eighteen inches in length, and the flower-stem rises between the leaves, also from the root, attaining the same height, decorated with many bright white liliaceous flowers, of the hyacinth form, arranged in a sort of spike.

In the former, the leaves and flower-stem rise a foot and half high, and produce many flowers; the second rises but six or eight inches, and rarely flowers here; and the third attains a foot in height, and flowers annually.

The fourth sort is furnished with an erect, succulent, jointed stalk, that obtains three or four feet stature, elevating a cluster or head of thin reflexed leaves at top; and from their centre proceeds the flower-stem, arising two feet high, branching each way, and beautifully decorated with numerous fragrant white flowers.

These plants, being exotics of delicate temperature, must be constantly kept in pots, and retained always in the stove.

The fifth sort is more hardy, and will stand our mild winters, if planted in a dry soil and warm situation.

The propagation of all the sorts is by offsets or suckers, which in the two first arise plentifully from the root, in the fourth from the sides of the stem, and may be taken off in summer, planted in small pots of sandy earth, and plunged in the bark-bed.

ALLEYS. In Gardening, Alleys are narrow paths between beds, borders, and other garden compartments, designed principally for the convenience of going between such compartments, to do what is necessary to the plants, and gather their produce. Alleys are also sometimes intended both for use and ornament in flower gardens.

In kitchen gardens, where a border is carried round next the walks, and immediately adjoining the main quarters of ground, it should be divided from the quarters by a two-foot Alley, for the convenience of carrying in dung and water, &c. and the large quarters should also be divided by one or two cross Alleys for the same purpose.

The proper width of Alleys between beds is from one to two feet; as, for example, Alleys between asparagus beds should be two feet wide; those between strawberries, a foot and half; and between beds of aromatic herbs, fifteen

fifteen inches: but between beds of onions, leeks, carrots, parsneps, lettuce, endive, and other small crops, ten or twelve inch wide Alleys are sufficient; the same also between beds of seedling and pricked out cabbage, favoys, celery, &c. for the convenience of going in to weed, water, and draw the plants for transplantation.

In flower gardens, Alleys are often designed both for use and ornament. Between beds of tulips, hyacinths, ranunculuses, anemones, and other flowers that are bedded, the Alleys should be eighteen inches or two feet wide; and to have them ornamental, the beds should be edged with box, and the Alleys filled with the best high-coloured fine gravel, or, in default of that, with sand or shells.

ALLIUM, Garlick, Onion, and Leek, &c.

By the laws of Linnæan botany, the onion and leek are retained as species of Allium, or garlick, and we shall treat of them accordingly; but, for distinction sake, shall first proceed with the garlick kind; then with that of the onion, *Allium Cepa*; next with the leek, *Allium Porrum*.

Class and order, *Hexandria Monogynia*.

Characters.] CALYX, is a spatha serving as a general cup, protruding many flowers. COROLLA, each is composed of six oblong erect petals. STAMINA, six subulated filaments, elevating as many oblong antheræ. PISTILLUM, a trigonous germen, simple style and stigma. PERICARPIUM, a triangular capsule of three valves, and cells pregnant with roundish seeds.

Of the garlick kind there are upwards of thirty species: but many of them being plants of no merit, we shall only notice those proper for æconomical purposes, and for ornament in gardens.

The species are,

1. ALLIUM sativum.

Common officinal Garlick.] Allium with compound bulbs, and plane cauline leaves.

2. ALLIUM Scorodoprasum.

The Rocambole.] Allium with plane, indented, cauline leaves, two-edged vagina, and stalk terminated by a head of bulbs.

The above two are officinal plants.—The following are of the flowery kind.

3. ALLIUM Moly.

Common yellow Moly.] Allium with broad, spear-shaped, radical leaves, a naked and nearly cylindrical stalk, and flat yellow umbels.

4. ALLIUM subhirsutum.

Hairy white Moly of Dioscorides.] Allium with plane cauline leaves, hairy below, awl-shaped stamina, and white umbels.

5. ALLIUM sphaerocephalon.

Spherical-headed purple Moly.] Allium with a taper stalk, half-taper cauline leaves, long three-pointed stamina, and round purple umbels.

6. ALLIUM roseum.

Rose-coloured Montpellier Garlick.] Allium with linear radical leaves, naked stalk, short pedicles, oval petals, short stamina, and rose-coloured umbels.

7. ALLIUM flavum.

Straw-coloured pendulous Moly.] Allium with round-taper cauline leaves, oval petals, long stamina, and pendulous pale yellow flowers.

8. ALLIUM magicum.

Great purple Moly.] Allium with plane cauline leaves, simple stamina, and bulbs growing in the branches of the umbel.

9. ALLIUM Victorialis.

Victorialis, or Elliptical Garlick.] Allium with elliptical, plane, cauline leaves, spear-shaped stamina longer than the corolla, and a round umbel.

10. ALLIUM descendens.

Oval, purple-headed Garlick.] Allium with an almost taper stalk, fistulous tricuspidated stamina, and oval heads composed of many small flowers, the lower ones green, and upper ones of a fine reddish purple.

All these species are of the bulbous-rooted tribe; some have very large bulbs, others not bigger than peas; they are perennial in root, but annual in leaf and stalk.

They are all extremely hardy, will prosper in almost any exposure and soil of a garden, and multiply exceedingly.

Most of the sorts have a strong scent like the common garlick

The first sort, *Common Garlick*, hath a large, round, white, bulbous root, composed of many smaller bulbs called cloves, each of which being planted, grow, and in one season attain the size and structure of the parent bulb; the leaves are cauline, or form a kind of stalk; which, in this species, seldom spindles, except when the same roots remain in the ground two or three years, when they run up and bear a flower, and small bulbs at top.

This sort merits culture in every garden, for its roots, for kitchen and other domestic uses.

The *Rocambole* hath very small compound bulbs, which grow in clusters; the stalk generally spindles two or three feet high, bearing many bulbs at its summit, which, as well as the root-bulbs, are useful for the same occasions as garlick, though they are much inferior to that species for domestic purposes.

With respect to the flowery kinds, the flower-

flower-stems rise immediately from the root, grow erect, and attain different heights, from twelve to thirty inches; in some the leaves are radical, in others cauline, i. e. elevated with the stalk; some are broad like those of a tulip, others long and narrow like a daffodil, and some taper and rush-like; and in all the sorts the stems are terminated by a spatha or sheath, from which is protruded an aggregate of many small flowers, forming a sort of umbel. The flowers singly are composed each of six petals, which, though separately small, many being collected into large heads, are very conspicuous.

The *Allium Moly*, *subhirsutum*, *sphaeroccephalon*, *roscum*, and *Allium flavum*, grow from twelve to fifteen or eighteen inches high, and their umbels continue a month in bloom.

The *Allium magicum*, *Victorialis*, and *descendens*, rise about a yard in height, and produce large and very ornamental umbels.

They flower in May, June, and July, ripen plenty of seed, and in some many small bulbs on the stalk and umbel.

Propagation, &c.

All the sorts may be propagated with the utmost facility by off-sets of the root, and many of them by seed, and the small bulbs on the stalk.

The Common Garlick is always propagated by the small bulbs that compose the main root, which may readily be divided into many separate cloves; these are to be planted in the spring, in beds four feet wide, in rows lengthways six to nine inches distance, six inches asunder in each row, and two or three inches deep; planting them either with a blunt dibber, or draw drills, and place the cloves therein, and cover them with the earth.

Being thus planted, they will shoot up their leaves in a month or six weeks; and all the culture they require is occasional small hoeing to kill weeds.

In the end of July or beginning of August, the bulbs will be full grown, as will be discoverable by the yellow hue, and withering of the leaves; then take them up, clean and dry them in the sun, and tie or plait them in bunches to be hung up for use.

The Rocambole may be propagated either by the off-sets of its roots, or by the cloves produced on the top of the stalks, which may be planted in spring or autumn; but in the autumn planting (October or November) they generally grow considerably larger than if planted in spring.

These are to be planted as directed for the garlick, and they will be fit for use in July or August.

It is however to be observed, the roots never acquire a large size.

All the flowering kinds propagate very fast by off-sets, which may be separated any time after the decay of the flower, taking only the largest, and plant them at once in the borders, and they will flower the following summer.

The propagation by seed is in a shady border in spring, and in autumn the plants will be fit to transplant.

ALLIUM-CEPA. The Onion.

We before noticed that the Onions are species of *Allium*, and under which genus we now range them; but to render the different species of that kind, and their culture more immediately conspicuous, and intelligible for practice, we judge it eligible to adopt this mode of separate arrangement.

The characters, &c. are the same as the garlick already described.

The species are,

1. ALLIUM-CEPA, *Cepa*.

The Common Onion.] *Allium* with a great bulbous root, fistular taper leaves, the flower-stalk naked, and with the lower part bellied.

Varieties.] Strasburg or Common round Onion.—Oval long-keeping common Onion.—Spanish large flat Onion.—Spanish silver-skinned Onion.—Spanish red-skinned Onion.—Portugal great roundish oval Onion.

2. ALLIUM-CEPA, *fistulosum*.

Ciboule or Welsh Onion.] *Allium* with root-bulbless: upright swelling leaves.

3. ALLIUM-CEPA, *Schœnopræsum*.

Cives or Chives.] *Allium* with root scarcely bulbous, or but very small, growing numerous together in a close bunch, producing a tuft of numerous small awl-shaped leaves.

4. ALLIUM-CEPA, *Ascalonicum*.

Eschalot or Shallot.] *Allium* with oblong bulbs in a close cluster, and slender awl-shaped leaves.

5. ALLIUM-CEPA, *canadense*.

Canada Tree Onion.] *Allium* with small bulbous root, and upright stalk, bearing clusters of small onion-like bulbs at top.

The first species and varieties have large bulbous roots; the plants are biennial, i. e. being sown in the spring, they arrive at perfection in the root the same year, and next year shoot up into stalk, flower, and ripen seed, when the stalks quickly die, and the individuals are at an end.

The second and third species never form any bulbs at bottom; they are hardy and perennial, and may be continued many years by the roots. See their *Culture*.

The fourth and fifth sorts are bulbous-rooted perennials, and multiply exceedingly by off-sets. Vide the *Culture*.

*Propagation and Culture ; and first of the
Common Onions.*

Of the several varieties of Common Onion, the Strasburgh is the best for general culture ; it is a handsome bulb, generally assuming a roundish and oval shape, is of firm growth, and keeps well for winter service.

The Spanish Onions are large and flat ; the first sort is of mildest flavour ; but all the varieties generally turn out very profitable crops, and none excels them for culinary purposes ; but they rarely keep so well, after Christmas, as the Strasburgh or oval Onion.

The Portugal Onion is a very large handsome bulb, of a roundish-oval shape, although they rarely attain the size here as in Portugal, &c. as is obvious by those imported annually from that kingdom by the orange merchants. If, however, seeds saved in Portugal are sown here, the bulbs will arrive at a much larger size than from seeds saved in England, especially if saved two or three years successively, which will often be so far degenerated, that the bulbs become flat, and not larger than the common onions.

This sort being very mild, is greatly esteemed for sauces, and other uses in cookery.

All these sorts are propagated by seed sown annually ; which, for the general crops, the proper season is from about the twentieth of February until the latter end of March, observing, however, in cold, wet, stubborn land, it is proper to defer sowing entirely until towards the middle of the last named month. It is likewise to be remarked, that in cases of omission in sowing at the times above-mentioned, it may be performed with tolerable success, in the beginning or any time before the fifteenth of April ; but remembering that the crops of the February or March sowing always bulb more freely, and acquire a much larger growth than those sown later.

The proper situation and soil for these crops should be an open exposure, and the land moderately light and rich ; choosing, however, a spot of the best mellow ground in the garden, with the addition, if possible, of a good coat of rotten dung, which should be dug in, one spade deep, (see TRENCHING, &c.) observing to preserve a level surface ; and while it is fresh stirred let the seed be sown, which is of particular importance. Do not, however, sow it when the surface is so wet or moist as to clog to the feet, or rake.

The proper quantity of seed is about an ounce to every rod or pole of ground ; but if it is not required to have them thick for cullings, two ounces for three rods is sufficient.

Be particularly careful to procure fresh

seed ; for of that which is more than one year old, not one in fifty will grow.

The seed may either be sown all over the piece or plat of ground, or the ground may first be divided into beds of four or five feet, allowing foot-wide alleys between ; sow the seed with a regular spreading cast, and immediately tread the surface over evenly upon the seed ; then, if in beds, may pare the alleys an inch or two deep, and cast the earth over the beds, and directly proceed to rake in the seed regularly, keeping an even hand, and trim off all stones, &c. See SOWING SEED.

The sowing them in beds is certainly the most eligible practice, when it is designed to draw or cull the young onions from time to time, for market or family service ; because in such cases a person can stand in the alleys without treading, at every turn, upon the beds, which renders the surface hard, to the detriment of the crop, as well as unavoidably trampling upon the plants themselves ; and it is likewise very convenient to stand in the alleys to weed, thin, or hoe the crop.

It is a common practice in the general culture of onions to sow them thick, to allow for culling or drawing out the superabundant plants by degrees as they are wanted. We, however, advise to sow a piece particularly for general culling, exclusive of the main crop ; for by a daily thinning out the superfluous plants, there is no avoiding treading upon, disturbing, and loosening the remaining ones ; and the plants thereby become of stunted growth.

Another very common practice is, the mixing of other crops, such as leek, lettuce, radish, carrot, &c. with the crops in question, a practice we declare against, as introducing confusion in general, and obstruction to the chief crop, without producing any considerable advantage ; nothing therefore should be admitted, except, if thought convenient, a thin sprinkling of coss lettuce.

In fifteen or twenty days after the seed is sown, the plants will appear ; and in a month or six weeks after that, in May and beginning of June, they will be three or four inches high, and weeds will be numerous, when they should be cleaned from weeds, and the main crop thinned to three or four inches distance. The weeding and thinning should be begun in due time, before the weeds branch and spread, which may either be performed by hand or small hoeing ; the latter is the most expeditious method, as one man may do as much as three, and is also the most beneficial to the plants ; for by stirring the ground about them with the hoe, it will greatly forward their growth, as will be obvious.

obvious in a few days after the operation. This, however, for the larger principal crops, is more particularly eligible, having for this occasion a good sharp one-hand hoe, about two inches, or not more than two and a half broad; and, taking the opportunity of dry weather, proceed in the hoeing, cutting up all weeds; and where the onions stand too close, cut them out in a regular thinning order to about three inches distance; or, in such crops as are not wanted for occasional culling, hoe them out at once to about four or five inches, having regard to leave the strongest plants as well as possible for the continuing crops, and not leave any where two or more plants close together, but all standing singly, at the proper distances, as above.

In two or three weeks, or little more, it will be proper to run over them again with the hoe; cut up all advancing weeds, and any superabundant plants that escaped you in the first hoeing: after this they will not require any further particular culture, than pulling out any casual straggling weeds.

And thus, by the above hoeings, in cutting down the weeds and superabundant plants in dry weather they will soon die; and that by stirring the surface of the ground in the work of hoeing, it will greatly promote the free growth of the general crop.

But in smaller crops, or where required for thinning or culling by degrees, for use in their young green growth and in small bulbs, the weeding, and any requisite thinning, where in clusters, may generally be performed by hand: and in the advanced growth of the crop, when you occasionally thin out the superabundant plants for use as wanted, should draw them somewhat regular, so as to leave a sufficiency of the strongest plants remaining at moderate distances, for a full crop to attain mature growth in large bulbs.

Continue to keep the different crops very clear from hurtful weeds in their advancing growth, in the months of May, June, and July, which being their principal growing seasons, they should have all necessary attention during that period, both in keeping them free from weeds, and in thinning the plants to proper distances in due time, before, in their advanced state, and a too close growth, they draw one another up weak and slender, which would retard their bulbing.

About the middle or latter end of June, the continuing crops will begin swelling a little at bottom in their bulbing order, but more fully in July; and in August the bulbs will arrive to full growth, proper for taking wholly up, and housed for keeping.

Towards the middle of August, therefore, examine the crops in general; when the necks shrink and fall, and the leaves wither, it may be presumed the bulbs are arrived at maturity, and are done growing, and should be pulled up, cleaned, dried, and housed for use: this should be done in dry weather; at the same time hoe and rake a piece of the ground clean, and, as you pull the onions, spread them thereon to dry and harden. Here let them lie a week or a fortnight, turning them every day or two, when, if the weather proves dry, they will be duly prepared for keeping: then take the first opportunity to house them before wet weather prevails. Let the bulbs be first divested of all adhering earth, loose skins, and the grossest parts of the leaves and neck, rejecting all infectious and bruised ones; and carry them into any dry upper room out of the damp, spreading them on the floor not more than a foot thick, but if room to lay them thinner, it will be an advantage.

Being now housed, the closer the room is kept the better, observing to turn them over once in three weeks, and clear out such as have any tendency to infection, which they would soon communicate to others in their neighbourhood, and it would become general.

Observations.] In the culture of onions it often happens, that, through badness of seed, many are disappointed of a crop, by waiting long in expectation of the plants rising, till it has been too late to sow again. In this case recourse may be had to transplantation from other gardens, either from a neighbouring one, where there are superfluous crops, or may purchase a bed, or such part of one as is necessary, from a market gardener; this should be done in May, or early in June, and if possible in moist weather: having a spot of well-dunged ground prepared, take up the plants with good roots, and plant them in rows six inches distance, and four inches asunder in each row, inserting the roots but moderately into the ground; for if planted too deep they will not bulb well; giving directly a good watering as soon as planted.

Repeat the waterings occasionally for a week or fortnight, and the plants will grow freely, and you will not be disappointed: they will form tolerably handsome bulbs.

Onions for pickling are in great request. Those proper for that purpose should not be bigger than common round buttons; to procure which in due quantity, some seed should be sown late in a spot of light poor land; about the middle of April is the proper time; sow it moderately thick, and the plants will need but very little thinning except they rise in very thick clusters.

clusters. They will bulb in June and July, and be fit to take up in August.

In the spring many of the keeping onions will unavoidably grow as they lie in the house: these may be planted out in rows six inches distance, and will serve to draw up by way of escallions.

Of the Autumn or Michaelmas Crop.

This crop is generally sown in August, and the plants arise before Michaelmas, stand the winter, some to draw occasionally for use in that season; but are intended principally for spring service, to draw up young for salads, &c. and likewise, if the Strasburgh or any other variety of the Common Onion are sown, they, if permitted to stand, will bulb to a tolerable size in June, and supply the kitchen or market as headed onions, till those of the spring crop are bulbed.

But as the Common Onion is liable to be cut off in severe winters, it is necessary always at the same time to sow some beds of Welch Onions, which bid defiance to the most rigorous frost. See their *Culture*.

We observed above, that August is the season for sowing these crops; if sowed sooner, they are apt both to get too forward in growth before winter, and to run up for seed earlier in the spring, and therefore the proper time to sow the main crop is the first or second week of that month, or in the third week for a late-standing crop; observing to sow them in beds four feet wide, with twelve inch alleys between; do not spare seed, and sow and rake it in as directed in the spring crop.

The plants will appear in a fortnight, and with them numerous weeds, to which early attention must be had to clear them out by hand before they begin to spread; but the plants of this crop are not now to be thinned.

In November and December, however, if they stand very thick, some of the largest may be thinned out occasionally for use.

Of saving Seed of this Species.

February is the proper time to plant onions for seed; though this is often done in October by those that save great quantities for sale.

For this purpose make choice of a due quantity of the largest and handsomest bulbs, rejecting all blemished ones, and such as have already made any effort to grow, and having made choice of a spot of ground well exposed to the sun, which being dug, proceed to plant the onions; strain a line, and with a hoe or spade open three drills, twelve inches asunder, and six deep, place the bulbs therein nine inches distance, and rake the earth over them; measure off two feet for an alley, and plant three more rows as above, and in that man-

ner proceed to the end; the wide space of two feet is by way of alley to go between to hoe and clear off weeds, as well as to stake and support the stalks of the plants when necessary.

In June the flower-stalks will be shot to their full height, and the flower-heads will be formed at top, to secure which, in erect position, drive some stout stakes in the ground along each row, at two yards distance, and from stake to stake fasten double lines of pack-thread; and if these are tied together in the intervals between the stems of the plants, it will effectually secure them.

About the latter end of August the seed will be ripe, which is very discoverable by the capsules opening, and the black colour of the seed: cut the heads in a dry day, and spread them upon cloths in the sun, but remove them under cover if rain, and at night; and in a week or fortnight beat or rub out the seed; clean it from the rubbish, and put it up in bags for use.

Observations.] Good onion seed is a very material article to be attended to: it is to be remarked that this seed never germinates freely after the first year; should therefore be careful to have entire new seed, without any mixture of old, which might prove a great loss and disappointment; to try its goodness, some, before they venture their general crop, sow a little in a pot, and place it in a moderate hot-bed, or near a fire; but the most expeditious method is this: tie about a thimble-full of the seed loosely in a piece of linen rag, and put it into a vessel of boiling water, suspended by a thread; in ten to fifteen or twenty minutes, pull it out, and if the seeds are good, they will in that short space of time be germinated or sprouted, perhaps a quarter of an inch in length.

Leek seed, being of a similar nature, may be tried by the same experiment.

Culture of the second Species, Ciboule, or Welch Onion.

The *Ciboule* or *Welch Onion* is a perennial plant; this never forms any bulb at bottom, so merits culture only to draw as young green onions for salads, &c. in spring; but on account of its strong temperament of taste, is greatly inferior to those of the Common Onion. However, as the plants being so extremely hardy as to survive the severest winter, that although their blades are generally cut off, the roots remain sound, and shoot forth with great vigour early in spring, and furnish a seasonable supply till May, when they generally run to seed, and for which singular peculiarity of hardiness, they merit general attention, to cultivate more or less as a winter-standing

standing crop of young onions, for spring supply.

We noticed above of their being perennial; they are so in root, which encrease by off-sets into great clusters; but they are not to be propagated thereby for general use; their propagation is by seed, the same as the former sorts.

These are cultivated principally to stand the winter for spring service. The season for sowing them is in August. See *Michaelmas Onions*.

The plants will appear in twelve or fifteen days; and towards Michaelmas let them be carefully hand-weeded.

It is peculiar to this species to lose their tops in November or December, and remain divested thereof till towards Candlemas, when the roots shoot forth again; at this period it will be good culture to dig the alleys, and spread about an inch depth of the earth evenly over the surface of the beds; it will add vigour to the roots, the plants will rise strong, and all that part within the earth will be blanched white, which will be more agreeable to the eye, and the whole will be more tender and mild to eat, either alone or in fallads.

If the sowing of a Michaelmas crop has at any time been omitted, you may sow some seed of this sort towards the end of January; the plants will rise in February or March, and being hardy, will continue growing, and be fit to draw in April or May.

To save plenty of seed of this species, it is proper to retain some plants for stools. In the end of March put out a parcel of strong young plants, nine inches distance, which will produce seed in August; let the roots remain, and in the following years will produce treble the quantity; but as they encrease into great bunches, the stools should be removed and separated every third year.

Culture of the third Species,—the Cives.

This is the smallest of all the onion kind, it rising but a few inches high; but its roots are perennial, and increase considerably into clusters, from which rise large tufts of slender awl-shaped leaves, which are the principal part used, the roots never forming any bulb, at least not bigger than small peas.

This little hardy plant merits a place in every garden: its clusters of leaves rise early in spring, which are useful both in fallads, and for culinary occasions, in default of onions; and the method of gathering it is to cut the leaves off near the ground, and a fresh supply is soon produced from the bottom; or, occasionally for use, the plants in clusters

may be slipped quite to the root in separate little plants, resembling young onions, and as substitutes for such, used in fallads, &c.

It is easily increased by dividing the roots in spring, and plant eight or ten together in holes six inches distance, and by autumn they will be multiplied into large bunches.

Culture of the fourth Species,—Eskalot, or Shallot.

This species of onion is bulbous-rooted, which increases greatly by off-sets, the largest of which are the proper parts of the plant for use.

The bulbs of this plant are oblong, irregular, and seldom grow large, because they generally increase into clusters, that they cannot swell like roots that grow singly; from the root are produced many long, narrow, infirm leaves, coming up in spring, and wither in July or August, when the roots are full grown; which being then taken up and housed, will keep in good perfection till next spring.

The propagation of this plant is by the smaller roots or off-sets; these may be planted in autumn, or early in spring, the end of October, or beginning of November, for the autumn planting; and February and March for that of the spring, but not later than the beginning of April, though the spring is the most general season of planting them; but when planted in autumn, in a dry light soil, they often grow larger, and sooner attain full growth the following summer: they are to be planted in beds four feet wide, in rows lengthways, the bed six inches asunder; each off-set inserted singly; either by dibble, or placed in drills not more than two or three inches deep, and the distance as above in each row: they will shoot up in leaves in March or April, and the roots increase in growth till July or August: all the culture they require is to keep them clean from weeds by occasional hand-weeding or hoeing.

Towards the end of July, or beginning of August, the bulbs will have attained their full growth, as will be determined by the withering of the leaves; take them up in a dry day, and spread them in the sun to harden; then clean and house the largest for use, and reserve the smaller off-sets for propagation.

But as sometimes shallot is required as early as possible in summer-time for immediate use;—in which case, as they will have formed small bulbs towards the latter end of May or in June, may take up a few occasionally just for present supply as wanted; permitting a principal crop to remain for full growth, as above.

Culture

Culture of the fifth Species,—Tree Onion.

The Canada Tree Onion merits culture both as a curiosity in producing the onions at top of the stalk; and for the said onions in domestic uses, particularly for pickling, in which they are excellent, and superior in flavour to the common onion; and may also be used occasionally for other purposes in which onions are used.

It is perennial, and is propagated by planting the bulbs in spring or autumn, either the root-bulbs, or those produced on the top of the stalk, planted in a bed or beds of any good earth, in rows a foot asunder, six inches distance in each row, and two or three inches deep.

They will shoot up leaves and stalks in the spring and summer, and produce the bulbs for use in July or August; and the root-bulb remaining, will furnish a production of top bulbs, annually in that season.

The root-bulb, increasing by off-sets, may be taken up occasionally when the stem decays, in autumn; or once in two or three years to separate the off-sets if wanted, and replanted again.

ALLIUM-PORRUM, the Leek, being the third and last division of the genus ALLIUM.

The general characters are the same as the Allium before described.

The species and varieties are,

ALLIUM PORRUM, *Porrum*.

The Leek.] Allium with an oblong tunicated root, plane cauline leaves, flowers gathered in close heads, and triple-pointed stamina.

Varieties.] Broad-leaved or London Leek. —Narrow-leaved Leek. —Striped-leaved Leek.

These plants may be deemed annual-biennial; for although the roots often survive after perfecting seeds, yet the plants always attain perfection the same year they are sown, and next year they run up to stalk, and become unfit for use.

The seed-stalk of this does not belly like that of the onion.

The first of these three varieties is the sort proper for general culture, which attains a large growth, the neck acquiring a thick substance, in length from six to nine or ten inches, dividing upward into many large, long, thick leaves, arranging themselves fan-fashion.

The second sort runs up with a long thin neck, and narrow thin straggling leaves, which being a degenerate variety, does not merit culture.

The striped-leaved kind is retained for va-

riety, which may be continued by suckers arising from the old roots.

Propagation, Culture, &c.

The Common Leek is raised annually from seed sown in the spring; the proper time for sowing the general crop for autumn and winter service, is the same as advised for the onion, i. e. from the twentieth of February to the end of March; but for later crops to stand for spring use, may sow any time in April; or for a small crop to stand as late in the following spring as possible, without running for seed, may sow some in the beginning of May.

It is a common practice with many, out of a false notion of making the most of their ground, to sow Leeks along with their crops of onions, which is what we would not recommend, having experienced it to be considerably the best culture to keep them separate, though it is often practised by the market gardeners, when intending to cull out the onions from time to time for market; so that by a daily thinning they are often mostly all cleared off by the end of July; and those being gone, the same ground remains occupied by a crop of Leeks; but this cannot be practised to equal advantage in the main crops of onions that are to stand to grow to full size for keeping.

The best culture therefore we would recommend for the general crops of Leeks, is to sow them pretty thick in a spot by themselves, to be afterwards transplanted, either wholly, or the greater part thinned out regularly and planted; the others left at good distances to remain for full growth.

The same situation, soil, and method of sowing, is to be observed as directed for the onion.

In June, July, and August, the plants will be of due size for transplanting: make choice of an open spot of the best ground, and if dunged it will be of much advantage, digging in the dung one spade deep; then draw a parcel of the largest Leeks, and trim their tops and the extreme parts of their root-fibres, and proceed to plant them by line and dibber in rows, which for the early crop should be twelve inches distance, and eight or nine inches a-part in each row; and for latter crops nine inches between the rows, and six the other way is sufficient; putting them three or four inches in the ground, or nearly to the length of their necks, and directly let them be watered.

All the culture they require is to be kept clean from weeds, which may be done either by hand-weeding, or more expeditiously by applying a sharp hoe in dry weather.

Leeks thus cultivated will be finer than those that remain where sown; their necks, which is the principal esculent part, will be much longer; and all that part within the earth will be finely whitened, and rendered mild and tender, which is a desirable property in the Leek.

However when intended to raise a crop of Leeks in good perfection, to remain where sowed to acquire full growth, the seed should be sown thinner; and when the plants are of some advanced state in June and July, should be regularly thinned, about ten or twelve inches distance at least: those thinned out may be planted in another compartment; and the remaining plants will attain a larger thick growth below, and with large spreading tops of thick fleshy leaves.

The Leek is a valuable family plant from autumn till spring, both for soups, broth, &c. and to boil neck-part and top-leaves together, to use as greens, like coleworts, &c. to eat with flesh-meat; is in perfection from September till May, when they shoot up to stalks for seed.

To save Leek seed, mark a quantity of the finest plants, and in February transplant them into a sheltered sunny compartment, or under a south wall, pale, hedge, or reed fence; this is necessary, because the seeds ripen late in autumn, and unless assisted by such situation and shelter, they do not always ripen freely in England.

It would be of particular advantage to plant some in a row close along under a south fence, at ten or twelve inches distance in the row.

They will shoot up their stalks considerably in May; and in June will attain two or three feet stature, when they should be supported, and continued in an upright growth. In July the flowers will be protruded from their sheath at the summit of each stalk, and form a large globular head or aggregate; and in September the seeds will begin to ripen. When that is effected, cut the heads with part of the stalk, tie them in small bunches, and hang them across lines in a dry airy apartment, two or three months; when the seed will be hardened, and the capsules will readily break by threshing or rubbing, to discharge it from the cells.

ALOE, the *Aloe Africana*, or African Aloe.

The number of Aloes is very considerable; many of them of singular beauty and curiosity: they are universally perennial, succulent, and evergreen, chiefly natives of Africa, and consequently require shelter here in winter, though the major part need only that of a green-house.

Former botanists, before Linnæus, having

conjoined this genus and the Agave or American Aloe, on account of their conformity of habit, are now ranged as distinct genera, principally from this circumstance, that in the former the seed-bud or germen is placed within the corolla; in the latter, below it. There is also obvious difference in the growth of the plants; in the Agave the centre leaves are closely infolded, inclosing the flower-stem, and never flower but once, and that not till they have attained a great age, then perish, (see AGAVE). In the Aloe the leaves are open quite to the centre, and the flower-stem is protruded from one side thereof, and the plants survive and continue flowering annually.

Class and order, *Hexandria Monogynia*.

Characters.] CALYX, none. COROLLA, one long tubular petal, six-parted, and spreading at the brim. STAMINA, six filaments, and simple antheræ. PISTILLUM, a germen placed within the corolla, a single style, and trifid stigma. PERICARPIUM, the germen succeeds to an oblong capsule of three cells, furnished with angular seeds.

The principal species and varieties are,

1. *ALOE perfoliata*.

Perfoliated-leaved Tree Aloe.] Aloe with a tall upright stem, supporting a head of narrow leaves at top, the bases broader, closely embracing round the stem like a sheath, narrowing upward to a point, edges indented, thorny, and a corymbus of red flowers drooping.

2. *ALOE mitriformis*.

Mitre-shaped Aloe.] Aloe with an erect stem, elevating broad, erect, spinous-edged, converging leaves, and drooping flowers, in a nearly cylindrical corymbus.

3. *ALOE arborescens*.

Tree or Sword Aloe.] Aloe with an erect shrubby stem, elevating long, narrow, reflexed, indented, spinous leaves, embracing the stem with their base, and pyramidal spike of red flowers.

Variety.] Broad-leaved sword Aloe.

4. *ALOE ferox*.

Great hedge-hog Aloe.] Aloe with a shrubby stem, supporting broad, dark green leaves, embracing it with their base, and having every side armed with robust spines.

5. *ALOE plicatilis*.

Plaited, or Fan Aloe.] Aloe with a shrubby stem, supporting heads of long, compressed, sword-shaped, unarmed leaves, standing two ways, with the edges lapping over one another, plait-folded like; and loose spikes of reddish flowers.

6. *ALOE succotrina*.

True Succotrine Aloe.] Aloe with an erect stem, long, narrow, spinous-edged, succulent leaves,

leaves, collected into diverging heads, and a long spike of red flowers.

7. *ALOE saponaria.*

Soap Aloe.] Aloe with a short stalk, broad, mottle-spotted, spinous-edged leaves, spreading horizontally every way, embracing the stem with their base, and red flowers in umbels.

8. *ALOE variegata.*

Variiegated, or Partridge-breast Aloe.] Dwarf Aloe with triangular, short, thick, variegated, white and green, slightly-sawed leaves, turning back at the ends, and ranged three ways; and red flowers in loose clusters.

9. *ALOE linguiformis.*

Tongue-shaped Aloe.] Dwarf Aloe with narrower short tongue-shaped, close growing, slightly spotted, two-ranked leaves, and drooping flowers.

Varieties.] Tongue Aloe with longer and deeply spotted leaves.—Tongue Aloe with broad, faintly spotted leaves, ranged closely together.

10. *ALOE verrucosa.*

Warted Tongue Aloe.] Dwarf Aloe with long tongue-shaped leaves, concave above, and carinated below, ranged two ways, closely warted or studded with white tubercles, and drooping red flowers.

Varieties.] Warted keel-shaped Aloe, having broad, thick, keel-shaped leaves, and spread every way.—Warted coral Aloe, having broad, short, thick leaves, standing two ways, and coral-coloured flower-stalks.

11. *ALOE margaritifera.*

Pearl Aloe.] Dwarf Aloe with clustered, thick, short, triangular-pointed leaves, the points long and turn up, closely covered with pearly tubercles, and flowers having two lips, the upper one erect, the under one spreading.

Varieties.] Smaller Pearl Aloe, having very short leaves.—Least Pearl Aloe, having extremely short thick leaves.

12. *ALOE arachnoides.*

Cobweb Aloe.] Dwarf Aloe with flat growing, short, plane, fleshy, triangular-pointed leaves, the edges closely set with numerous hair-like spines, cob-web like.

Variety.] Cobweb Aloe, with cylindrical-based, triangular-pointed leaves.

13. *ALOE retusa.*

Cushion Aloe.] Dwarf Aloe with very short, thick, swelling leaves, having triangular ends, and the upper side compressed like a cushion.

14. *ALOE humilis.*

Dwarf Hedge-hog Aloe.] Aloe with short, erect, broad-based, taper leaves, triangular at the ends, and both surfaces closely set with spines.

15. *ALOE spiralis.*

Spiral upright Aloe.] Aloe with a short stem, closely set round with ovate-triangular, sharp-pointed, imbricated leaves, disposed in several ranks; and long close spikes of flowers.

Varieties.] Pentagonal Upright Spiral Aloe, having the leaves ranged five ways.—Triangular Upright Spiral Aloe, having leaves standing three ways like a triangle.

16. *ALOE maculata.*

Spotted Aloe.] Short stem, leaves triangular, tapering to a point, smooth, spotted, upright; and bunches of red flowers, curved drooping.

Varieties.] Broad-leaved.—Narrow-leaved.

17. *ALOE carinata.*

Keel-shaped Aloe.] Without stem, leaves scimitar-tongue-shaped, angle-keel-formed underneath, studded, spreading, and racemi of pale red flowers, curved drooping.

18. *ALOE viscosa.*

Viscous Upright Triangular Aloe.] Aloe with a very short stem; leaves triangular, and imbricated in three ranks, triangle-form; and racemi of ovate, greenish flowers, drooping.

19. *ALOE barbadensis.*

Barbadoes Aloe.] Aloe with upright broadish thick very succulent leaves, subulate, indented; and a loose spike of yellow flowers.

20. *ALOE glauca.*

Glaucous, or sea-green Aloe.] Aloe with a short stem, leaves embracing in two ranks, edges armed with erect red spines, and flowers collected in a head.

21. *ALOE depressa.*] Depressed short-leaved Aloe.

22. *ALOE lineata.*] Lineated, or striped Aloe.

Of the above collection of Aloes, the first fifteen sorts are the most generally known; the others, however, increase the variety in a diversified order in their different growths, leaves, flowers, &c.

These plants obtain different sizes, from three inches to two or three yards, and are of various singular growths, producing leaves of many different sizes, shapes, and determinations. Some rise with erect stems, supporting leaves two or three feet in length at top; others are composed entirely of dwarf leaves, standing in a cluster on the crown of the root, of which, some grow flat to the earth, others grow erect, some spread every way, others range in two, three, and five different directions, and various other positions, that in the whole they afford a great source of variety.

The

The roots of all the sorts are fibrous and perennial.

The first six or seven sorts rise with an erect stem, elevating the leaves; the others are chiefly of low dwarfish growth, with the leaves rising immediately from the root. The stalks and leaves are also perennial, at least the same leaves are of several years duration, and continue increasing in size, attaining, in different species, from three inches to three feet in length, and from one to six inches broad at the base, and end in a point; and those of all the sorts are thick, succulent, and of fleshy substance. The flower-stems in all the sorts rise among the leaves, and attain from twelve or eighteen inches to three feet in height, the flowers standing in a spike at the top, each flower formed of one tubular petal, the colour chiefly red, and some are of a white and greenish hue, appearing at different times, but mostly in autumn.

All the sorts flower annually in their native soil, and most of them do the same here, especially if they are wintered in a stove.

The *Mitre Aloe* is so termed from the figure of its leaves; the stem is erect, and by degrees attains four or five feet stature, surrounded by broad, erect, dark green leaves, eighteen inches long; those at top form a head, and converge towards their extremity in form of a mitre.

The *Aloe arborescens*, *Aloe ferox*, and *Aloe plicatilis*, rise each with a strong naked stem, which, in many years' growth, attains eight or ten feet in height, and supports the leaves at top, which attain two feet or more in length.

The *Succotrine Aloe* advances with an erect stem, gradually rising three or four feet high, supporting the leaves in heads at top, grows two feet long, and diverges every way.

The *Soap Aloe* rises with a short stem, eighteen inches or two feet high, adorned on every side with horizontal leaves, of a dark green colour, spotted with white, somewhat resembling the colour of soft soap, whence the plant derives the name.

The *Aloe variegata*, *Aloe linguiformis*, *Aloe verrucosa*, and *Aloe margaritifera*, are plants of humble growth, have no stalk, the leaves standing in a cluster on the crown of the root, and growing from six to twelve inches high.

The *Cobweb* and *Cushion Aloe* rise but a few inches high, the leaves sit close to the earth.

The *Aloe humilis* rarely rises more than five or six inches high; the leaves stand in a cluster on the head of the root, and grow nearly erect.

The *Aloe Spiralis* rises ten or twelve inches

high, having a short erect stem, closely set with short thick leaves on every side, from bottom to top, placed one above another.

The *Aloe maculata*, *carinata*, *viscosa*, and the other four following species, being of different degrees of growth, and various in their leaves and flowers, effect an agreeable diversity among the other species and varieties.

Culture, Propagation, &c.

All these plants are natives of Africa, and other warm countries, and in this climate require the shelter of a green-house, from the end of September until the beginning of June, so must always be retained in pots. It is, however, to be remarked, that although these plants may be wintered very well in a green-house, yet if they are indulged with the temperature of the stove during that season, they more certainly produce flowers annually.

With respect to the general culture of all these plants, they may be placed in the full air from the beginning of June until the middle of September; but observing, if immoderate rains prevail, they should have occasional shelter, otherwise, as being very succulent, it would rot them. In summer, when the weather is hot and dry, they will need moderate watering twice a week, but in winter, in a green-house, once in two or three weeks is sufficient.

The plants in general should be shifted into fresh earth every year or two, and they will occasionally require larger pots, either of which operations may be performed any time in summer. See SHIFTING PLANTS.

When any of the leaves are decayed, broken, or bruised, they should be cut off close.

The propagation of the greater part of these plants is effected by the off-sets or suckers, which most of the sorts yield abundantly; and those that furnish none may be increased by cutting off their leaves, which, with the aid of a hot-bed, emit roots freely.

The time of year for either of the above methods of propagation, is June, July and August; though it may also be performed in the spring in April and May, or any time from that season till September, according as the off-set suckers occur of proper growth.

The Method as follows:

In the first place, prepare a compost of light sandy loam from a pasture, or where most conveniently attainable, or any other light earth; and nearly an equal portion of sea-sand, or in default thereof, dry, sandy road-soil, the scrapings of turnpike roads, after lying till it become dry and sandy-like; mixing the whole

together into an heap, ready either for immediate use, or to remain exposed to the full air and sun for some time, to improve it to greater advantage: then, at the season above-mentioned, slip off the suckers from the parent plant, and observe if their bases are very moist, lay them in a dry shady place three or four days, till they become dry and firm; this done, get the pots, which should be thirty-twos or forty-eights, for the small sorts, and fill them with the compost; plant one sucker in each pot, and directly give water, and place the pots in a green-house, or in a common frame, to be screened occasionally from the sun and violent rains, and in three or four weeks they will be firmly rooted; and may then be fully exposed, but defending them however from excessive wet, which is apt to rot these succulent plants.

The propagation by leaves is necessary for such plants as afford no suckers. In June cut off some fresh under-leaves, and lay them on a shelf a few days, till their succulent bases are healed over, then plant them in small pots as above, and plunge them in a hot-bed, giving occasional shade, water, and fresh air.

The substance known among druggists by the name of Aloes, is the inspissated juice of the *Aloe succotrina* and *barbadensis*; the finest is that of the Succotrine Aloe, and is greatly used in medicine; that of the other is commonly called *Hepatic Aloes*, and is used chiefly for horses.

The above juice is drawn from the plants by expression or incision; that of the Succotrine Aloe is yellow, bitter, and smells like myrrh.

ALSTRÆMERIA.

Consists of hot-house exotics from South America, herbaceous and perennial, adorned with lance-shaped leaves, and very ornamental hexapetalous flowers.

Class and order, *Hexandria Monogynia*.

Characters.] CALYX, none. COROLLA, hexapetalous and sublobed; the three outer petals wedge-shaped and retuse; the interior ones spear-shaped. STAMINA, six subulate declining unequal filaments, with oblong antheræ. PISTILLUM, the germen inferior, hexangular, truncate; a slender declining style crowned by three oblong, bifid stigmas. PERICARPIMUM, a roundish, six-ribbed, pointed, trilocular capsule, filled with many globose seeds.

It comprises several species: the most noted are,

1. ALSTRÆMERIA *pelegrina*.

Spotted-flowered Alstræmeria.] Rises with many erect herbaceous stems, three feet high,

garnished with linear spear-shaped leaves; and the branches terminated by the flowers on long footstalks two or three together, mostly whitish, beautifully spotted with red and purple; appearing very ornamental from May or June till October.

2. ALSTRÆMERIA *Ligtu*.

Striped-flowered Alstræmeria.] Rises with erect herbaceous stems, garnished with spatulate oblong-lanceolate leaves above; and striped white and red flowers in the spring, and great part of summer and autumn.

ALSTRÆMERIA *Salsilla*.

Climbing Alstræmeria.] Rises with twining-climbing stems, spear-shaped acuminate leaves; and lateral red or purplish flowers.

These three species being natives of Peru, require the protection of a stove in this country; though they will also succeed tolerably in a good green-house. Are retained in many of our gardens, and highly merit culture for the beauty of their ornamental flowers, appearing in May or June, &c. and frequently continue blowing in succession all the summer months.

They are propagated by seeds, cuttings of the stalks, and parting the roots, any time in spring, assisted by a hot-bed; and the plants always kept in pots of light earth to have the protection of the stove, &c.

ALTHÆA. Marsh-Mallow.

The plants are herbaceous perennials, of hardy growth, obtaining an annual stature of four or five feet, adorned on every side with large, roundish, velvety leaves, and mallow-like flowers.

Class and order, *Monadelphia Polyandria*, many stamina united in one body.

Characters.] CALYX, two monophyllous cups, the outer one nine, and the inner five-parted at the brims. COROLLA, five heart-shaped petals expanding above. STAMINA, numerous filaments united in a pillar. PISTILLUM, an orbicular germen, many-pointed style, and many stigmas. PERICARPIMUM, the calyx becomes a round depressed capsule of many cells, containing kidney-shaped seeds.

The principal species are,

1. ALTHÆA *officinalis*.

Common officinal Marsh-Mallow.] Althæa with angulated, pointed, and sharply-indented downy leaves.

Varieties.] Common Marsh-Mallow with roundish angulated leaves.—Common Marsh-Mallow with deeply sinuated leaves.

2. ALTHÆA *cannabina*.

Hemp-leaved Hungarian Marsh-Mallow.] Althæa with the lower leaves palmated, those above more deeply fingered.

The

The first species and varieties succeed in any common soil and exposure; the second requires a dry soil.

The roots of all the sorts are fibrous and perennial, from which are produced strong, erect, tall growing stems, which, in the common sorts, are herbaceous and annual; in the second somewhat woody, and of two or three years duration.

The stems of each sort rise four or five feet high, emitting side branches, adorned with simple leaves, in alternate arrangement, which, in the common sorts, are velvety; in the other a little hairy; and from the angles of the branches and leaves proceed the flowers, which are reddish, composed each of five petals, shaped like those of the Common Mal-low, but smaller, appearing in June and July, and seeds ripen in autumn.

All the varieties of the first grow wild in marshy places in many parts of Britain, &c. the second in Hungary.

The Common Marsh-Mallows are esteemed principally as medical plants, but are also admitted in gardens by way of variety; the second sort is also retained in the gardens of the curious.

Culture.

All the sorts may be propagated plentifully by seed sown in the spring, and the common sorts also by parting the roots at that season, or rather in autumn, when the stems decay, observing, if they are to be cultivated for medical uses, to plant them in beds fifteen or eighteen inches distance.

ALYSSUM, *Alysson*, or Madwort.

This genus retains many species, most of which may be deemed under-shrubby, herbaceous perennials, of the ornamental flowery kind, which attain from one to two feet stature, adorned with hoary leaves, and flowers in clusters at the ends of all the branches.

Class and order, *Tetradynamia Siliculosa*.

Characters.] CALYX is four-leaved, and deciduous. COROLLA, four petals disposed like a cross. STAMINA, two short and four long filaments, having broad antheræ. PISTILLUM, an oval germen, single style, and blunt stigma. PERICARPIUM, a round compressed pod, containing flat seeds.

There are many species: those of most note are,

1. ALYSSUM *saxatile*.

Rock common yellow Alysson.] Alyssum with a shrubby branching stalk, spear-shaped, entire, waved, soft leaves; and yellow flowers in panicles.

2. ALYSSUM *halimifolium*.

Sea-Purslane-leaved Alysson.] Alyssum with

shrubby trailing stalks, narrow, spear-shaped, pointed, entire leaves; and white flowers in clusters.

3. ALYSSUM *montanum*.

Mountain dark yellow Alysson.] Alyssum with shrubby trailing stalks, and diffused branches, spear-shaped, obtuse, hoary leaves; and dark yellow flowers in clusters.

4. ALYSSUM *deltoidium*.

Deltoid-leaved Alysson.] Alyssum with shrubby trailing stalks, lanceolate - deltoid leaves; and violet-coloured flowers in loose spikes.

5. ALYSSUM *spinosum*.

Prickly Alysson.] Alyssum with erect branches, armed with spines; and white flowers disposed in clusters.

6. ALYSSUM *incanum*.

Hoary erect Alysson.] Alyssum with erect stalks, spear-shaped, hoary, entire leaves; and white flowers in a corymbus.

7. ALYSSUM *creticum*.

Cretan yellow Alysson.] Alyssum with an erect herbaceous stalk; downy, spear-shaped, entire leaves, bright yellow flowers in clusters, and swollen seed-pods.

All these species are natives of France, Spain, Portugal, &c. but succeed here in any common soil of a garden, where moisture is not copious.

They have somewhat shrubby succulent stalks and branches, growing from one to two feet high, which, in the first six species, become woody and abiding; in the other, they being more herbaceous and succulent, seldom continue above two or three years: all the sorts are adorned with hoary leaves, and flowers produced in clusters at the end of all the shoots; each flower is composed of four cross-shaped petals, which, though small, being numerous on each plant, are very conspicuous, appearing at different times in summer, and succeeded by ripe seed in autumn.

The *Common yellow Alysson* produces erect stalks a foot high, dividing into many low spreading branches, each of which is terminated by loose spikes of flowers in May, and continue a month.

The *Alyssum halimifolium*, *montanum*, and *deltoidium*, spread their branches each way upon the surface of the earth, having every shoot terminated by the flowers, which, in the former, continue five or six months.

The *Alyssum spinosum*, *incanum*, and *creticum* are of erect growth, the two former attaining two feet stature, the latter about eighteen inches, branching out upward, adorned with clusters of flowers, proceeding from the ex-

tremitly of each branch, appearing in June, July, and August.

Culture, Propagation, &c.

As all these plants in their native climate prevail chiefly in rocky, dry, gravelly, and rubbishy places, the same should be imitated here in their culture; let them therefore occupy places in dry warm borders, &c. because in rich moist soils they become very succulent, and the frost affects them in winter.

All the species may be propagated by seed, and most of them also by slips and cuttings of their shoots.

The seed should be sown in April, in a bed of dry light earth, and the plants will be ready for transplantation early in autumn. The propagation by cuttings, &c. may be effected in April, May, and June, in a shady border, assisted by occasional waterings.

AMARANTHUS, Flower-Gentle, Love-lies-bleeding, Prince's-Feather, &c.

The number of Amaranths is very great; they are universally herbaceous and annual, some of which are curious ornamental plants, of singular beauty and elegance, attaining in stature from three to seven feet; some grow pyramidally, others branch out tree-fashion, &c. garnished mostly with large, oblong-oval, and spear-shaped leaves, and numerous very small flowers, without petals, closely collected in aggregate heads, and large long spikes, in the different species.

Class and order, *Monœcia Pentandria*.

Characters.] CALYX, three or five-coloured permanent leaves. COROLLA, none; the leaves of the calyx supply its place, and the flowers are monœcious. STAMINA, five, or sometimes but three filaments in each male flower. PISTILLUM, in each female flower an oval germen, three styles, and three simple stigmas. PERICARPIMUM, an oval capsule of one cell and one seed.

The species that demand attention are,

1. AMARANTHUS *tricolor*.

Tricolor, or Three-coloured Amaranthus.] Triandrious Amaranthus with an erect stem; oval, spear-shaped, three-coloured leaves, and roundish heads of flowers embracing the stem.

2. AMARANTHUS (*bicolor*) *melancholicus*.

Bicolor, or Two-coloured Amaranthus.] Triandrious Amaranthus with an erect stalk; spear-shaped, pointed, two-coloured leaves; and flowers collected in a roundish head, sitting close to the stem.

3. AMARANTHUS *maximus*.

Tree Amaranthus.] Pentandrious Amaranthus with an erect tree-like stem, branching

horizontally, and large, hanging almost cylindrical spikes.

4. AMARANTHUS *caudatus*.

Trailing spiked Amaranthus, or Love-lies-bleeding.] Pentandrious Amaranthus with an erect stem, branching horizontally, and very long, hanging, and trailing cylindrical spikes.

5. AMARANTHUS *sanguineus*.

Bloody-leaved Amaranthus.] Pentandrious Amaranthus with erect stalks and branches, oblong-oval leaves, compound erect spikes, and the lateral ones spreading.

6. AMARANTHUS *hypochondriacus*.

Dark purple Amaranthus, or Prince's Feather.] Pentandrious Amaranthus with erect stalks and branches; oval-pointed leaves, and clustered erect spikes.

The first five species are tender exotic annuals, that require to be raised in a hot-bed, and the sixth is an annual of hardy growth. See their *Culture*. They are natives of America, Asia, &c.

These plants rise with erect stems, from two to seven feet high, rising annually in the spring from seed; attain their full height, flowering state, and general perfection, in July; continue in beauty three months; perfect seeds in September and October; and in November they wholly perish.

The flowers of all the species are devoid of petals or flower-leaves; the leaves of the calyx or cup, which are of a purple colour, and permanent, supply their place.

The *Amaranthus tricolor* and *bicolor* grow four, five, or six feet high, and assume a beautiful pyramidal growth, adorned with large and elegantly variegated leaves, which, in the former sort, are green, yellow, and bright red; in the latter, a dark purple, and deep crimson, very conspicuous, and appear with great lustre, and are the principal ornament of the plants.

The flowers of both these species sit close to the stalks in small round heads, and make but little appearance.

The *Tree Amaranthus* is an annual of stately growth, and grand appearance; it rises with an erect substantial stem, seven feet high, at every ten or twelve inches sending forth many horizontal branches, ornamented with luxuriant, rough, green leaves; and large, long, roundish, purple flower-spikes, proceeding from the extremity of every shoot, and hanging loosely downward.

The *Amaranthus caudatus* obtains three or four feet stature, branching out every way horizontally, adorned with large pale green leaves, and very long, pendulous, purple spikes, at the joints and ends of all the branches

branches and shoots, some in clusters, others advance singly a yard in length, hanging down like a tail, and often trail on the ground, hence the plant obtained the old name, Love-lies-bleeding.

The *Bloody Amaranthus* rises a yard high, the stem and branches erect, terminated by large clusters of short cross-placed spikes, with an upright spike terminating each cluster; and the whole plant is of a blood-purple colour.

The *Amaranthus hypochondriacus* grows three feet high, dividing into many erect branches, adorned below with dark liver-coloured leaves, and terminated by large clustered, erect, purple spikes; this being an old resident in almost every garden, we admit it in the collection for variety: it is so hardy, that from the scattered or self-sown seeds many plants continue rising annually.

Use in Gardens, &c.

The first four species, when raised in their ultimate perfection, are great ornaments to the pleasure-garden, and the *tricolor* and *bicolor* are two of the most curious beauties of the annual tribe. These two species are always cultivated in pots, and disposed with cock's-combs, &c. to adorn court-yards, and other conspicuous compartments contiguous to the main habitation, grand walks, lawns, and ornamental garden buildings. The other four sorts are choice furniture for large open borders, and other compartments that verge principal walks, and home lawns, &c.

Propagation.

The propagation of all the species is by seed annually in the spring, assisted mostly by artificial heat in hot-beds, and some in the natural ground.

The two first sorts particularly require the aid of different hot-beds, and constant shelter of frames and glasses, until the latter end of June, otherwise the plants cannot be obtained of due stature, which, if less than three or four feet, they make no figure.

The general season for sowing these two species is March and beginning of April, not later, otherwise the plants will not attain a proper growth in any tolerable time in summer, (June or July), nor time enough to ripen seeds in perfection in autumn.

To raise these two curious annuals in their fullest lustre, they will require the aid of two or three different hot-beds, under frames and glasses; first make a small hot-bed in which to sow the seed, the same bed serving for these and several other tender annuals of similar quality; making the bed for a one or two light garden frame, earthing it at top within the frame, with light, rich, dry mould, four

or five inches thick, in which sow the seed, in small shallow drills, covered very lightly with fine earth; put on the glasses; and here raise the plants about an inch or two high, admit air in the day, and cover the glasses at night with a garden-mat; then, when the plants have obtained the above size, prepare a second hot-bed, and prick the plants therein four inches distance: give moderate waterings, and occasional shade from the sun, till they have taken root; and admit fresh air daily by raising one end of the light, and continuing the night-covering; and when the plants have grown here a month, they will meet and require more room, when a third and final hot-bed, of larger dimensions, should be made: place a frame thereon, and lay in four or five inches thickness of earth; then take up the plants with balls of earth about their roots, and plant each in a twenty-four sized pot; give water, and plunge the pots immediately in the earth of the bed, managing as above; observing, that, according as the plants reach the glasses, the frame must be occasionally raised or deepened (see ANNUAL PLANTS), continuing the lights always on, and tilt them at one end daily to admit air, giving water every day or two, and by the end of June the plants will have nearly attained their full stature, and the weather will be settled, when they should be brought forth and placed where they are to remain, observing to support each with a handsome strait stake.

The plants are to be continued in the pots; and their principal culture, after being placed abroad, is to supply them duly with water, which they will need every day in dry hot weather.

For more particulars on their culture, see ANNUAL PLANTS.

To obtain good seed of these two sorts, place some plants in a deep frame in September, to have occasional shelter of the glasses from wet and cold.

The propagation of the third, fourth, and fifth sorts, is also to be effected, in the best perfection, by the aid of artificial heat; the time to sow them is towards the latter end of March, or beginning of April. These three sorts, however, being hardier, do not require the aid of but one or two moderate hot-beds; that is, to be sown and raised in one till they are two or three inches high, then transplanted into a new one, which will forward them greatly, and in which to remain until the beginning of June, then taken up with balls of earth to their roots, and planted singly where it is designed they shall remain to flower. Some may be planted in pots, but the principal

pal part in the border, &c. giving water directly, and repeat the waterings occasionally for a week, till the plants have taken root.

Though, in default of hot-beds, it may be proper to observe that the third and fourth, or more particularly the latter, may occasionally be raised in a warm border or bed of natural earth; sowed in April, and planted out in June; but will not acquire the proper size or growth, nor produce large flower-spikes like those raised as above. See ANNUAL PLANTS.

The sixth sort will rise freely in the common ground; but to obtain it in more early and greater perfection, manage it as the last three sorts.

The seed of the last four sorts ripens towards the latter end of September, when some of the largest spikes should be gathered and spread in the sun, in a dry airy room, for a fortnight.

AMARANTHUS, the Cock's-Comb. See CELOSIA.

AMARANTHUS, the Globe. See GOMPHRENA.

AMARYLLIS, Lily-Daffodil.

The plants are of the bulbous-rooted tribe, and produce large liliaceous-like flowers, of extreme beauty and elegance.

Class and order, *Hexandria Monogynia*.

Characters.] CALYX, a spatha or sheath. COROLLA, six oblong spear-shaped petals. STAMINA, six filaments, with incumbent antheræ. PISTILLUM, a round germen, single style, having a trigonous stigma. PERICARPium, an oval capsule of three cells, inclosing round seeds.

* The species of note are,

1. AMARYLLIS *lutea*.

Yellow Amaryllis, or Autumnal Narcissus.] Amaryllis with a very low stalk, one bell-shaped, erect yellow flower from each sheath, having erect stamina, alternately longer and shorter.

2. AMARYLLIS *Atamasco*.

Atamasco Amaryllis, or Lily.] Amaryllis with one equal bell-shaped, erect flower, and declinated equal stamina.

3. AMARYLLIS *jarniensis*.

Guernsey Amaryllis or Lily.] Amaryllis with several flowers from each scabbard, having lineax, flat petals; straight stamina, and style longer than the corolla.

4. AMARYLLIS *Belladonna*.

Belladonna Lily.] Amaryllis with several large, bell-shaped, equal, somewhat erect flowers from each sheath, having flat petals, edges waved.

5. AMARYLLIS *regina*.

Queen's Amaryllis, or Mexican Lily.] Ama-

ryllis with two, three, or four large bell-shaped, nodding flowers, from each sheath.

6. AMARYLLIS *purpurea*.

Purple African Amaryllis.] Amaryllis with three or four large bell-shaped, somewhat erect flowers, from each sheath.

7. AMARYLLIS (*Superba*) *vittata*.

Superb or Ribband Amaryllis, or Ceylon Lily.] Amaryllis with a tall upright stem, and several large wedge funnel-shaped most beautiful flowers from the same sheath.

8. AMARYLLIS *formosissima*.

Most-handsome Amaryllis, or Jacobæan Lily.] Amaryllis with one large, irregular, nodding flower, and the stamina and style drooping.

9. AMARYLLIS *orientalis*.

Oriental Amaryllis, or Brunswigia.] Amaryllis with numerous irregular flowers in each sheath, and tongue-shaped leaves.

All these plants produce very pretty flowers; some are of singular beauty, and merit places in every curious garden, where there are conveniences for their culture. The two first are hardy; the third and fourth require shelter from frost; the other five need the aid of a stove, or good green-house.

General Description.

The roots are universally bulbous, mostly very large, and commonly oblong.

The flower-stem rises annually from the root, in most sorts naked and unattended by leaves, and attain different heights, from three inches to two feet, and at the termination or summit of each stem, is produced the flower-bud, which is a sheath or scabbard, that bursts and protrudes the flower or flowers, which are large, and composed each of six oblong petals, of the liliaceous form, appearing chiefly in autumn, some in the spring: and when they fade the leaves come up, which are generally long and narrow, some large and flaggy, and which, together with the main bulbs and off-sets, continue growing until May, June, or July, when the leaves decay; and, the plants then terminating their year's growth, is the proper time to remove or transplant the roots, and separate the off-sets for propagation.

The *Yellow Autumnal Amaryllis* attains but three or four inches in height, several stems rising in succession, each supporting one large yellow flower, in September and October.

The *Amaryllis Atamasco* sends up one stem, six inches high, elevating one large beautiful flower, carnation-coloured, changing almost white, appearing in summer or autumn.

The *Guernsey Amaryllis* is one of the finest flowers

flowers that can be seen. The stem rises a foot and half high, terminated by an oblong scabbard, from which bursts forth the cluster of flowers; the colour a bright shining red, spangled with golden specks, and a deep red vein running along the middle of all the petals. It flowers in September and October, and continues a month in full lustre.

The *Belladonna Lily* is an elegant flower of a fine delicate purple, and of sweet fragrance; blows the latter end of September and October.

The *Mexican Amaryllis* rises about a foot high, crowned by two, three, or four large flame-coloured flowers, in March or April.

The *Amaryllis purpurea* produces an erect, firm stem, a foot or more high, supporting an umbel of very large reddish-purple flowers, in spring or autumn.

The *Superb Amaryllis* demands esteem both for its beauty and delightful fragrance. The stem attains two or three feet in height, surmounted by six or eight snowy white flowers, having all the petals beautifully streaked with lines of purple.

The *Jacobæan Amaryllis* is a flower of superior beauty, and singularity of form. The flower-stalk obtains fifteen inches stature, crowned by the flower, there being only one, which is very large; the colour a beautiful scarlet, with crimson filaments, and yellow antheræ; the petals are irregular, and their determination is curious, three of which droop, two stand horizontally, and one erect; the whole nods on one side of the stalk. The plant flowers in spring, autumn, or winter; and it is peculiar to the species, that, after having sent up a flower-stem on one side of the bulb, it frequently sends up one or two more, in successive order, from the other sides.

The *Oriental Amaryllis* sends up a robust stem a foot high, terminated by a large swelling scabbard, which protrudes a considerable spherical cluster of fine red flowers, each of which have five of its petals turned inward, and the sixth stands outward. It flowers late in autumn.

Culture, Propagation, &c.

The bulbs of all these plants may be purchased at most of the nurseries, and planted in August and September.

The two first sorts may be planted in any dry warm border, especially the first, where they will flower annually; the other being somewhat impatient of severe frost, it is also necessary to plant some in pots, to have occasional shelter in winter.

The *Guernsey Lily* requires protection from

excessive wet and frost, so should be planted in pots to be moved to occasional shelter during their bloom, and from the rigour of winter; as, likewise, when in flower, to move them in their pots to adorn any particular place required, as a green-house, &c. or an apartment of a dwelling house.

Great numbers of these bulbs are imported hither annually from the Isle of Guernsey; for sale; they generally arrive in July or August, which if procured and planted before the middle of August, some of the large roots will mostly flower, in good perfection, the same season, in September and October; it being generally adviseable to plant them in pots for the reason above intimated; the proper size pots for this occasion are those called 24s. or 32s. which fill with fresh light sandy earth, or with sand: plant one bulb in each pot, or two, or three in a large pot occasionally, as thought proper; inserting them two or three inches deep the bottom part, or with the top just within the surface of the earth: place the pots to have shade from the mid-day sun during hot weather, or placed in a garden frame to be shaded with mats occasionally, or defended with the glasses from excessive rain, and cold nights, giving occasional moderate waterings; and about the middle of September, when the flower-bud will begin to make its appearance, remove them to the full sun, to remain till their flowers begin to expand, then place them to have occasional protection from rains and boisterous winds, either in a green-house, garden-frame, or any airy room.

When the flower fades, remove them into a garden-frame for the winter, to have occasional shelter of the glasses in times of violent rain, frost, snow, &c.

May permit the bulbs to remain unremoved two or three years, managing them as above, and they will afford a more considerable bloom the succeeding autumns. It is however always eligible culture to transplant the bulbs once in the above period into fresh earth, and separate the off-sets, which plant either in pots, or in a bed of light dry soil, giving occasional shelter in winter; and in three years they will attain a flowering state, when they are to be treated as already directed.

The *Belladonna Amaryllis* is tolerable hardy, and will succeed in a warm dry border, with occasional shelter from frost. It is however adviseable to plant some also in pots, and manage them as directed for the *Guernsey Lily*. If it is indulged with a stove, it generally flowers with greater lustre.

The *Mexican*, the *Purple*, and *Superb*, the *Jacobæan*, and *Oriental Amaryllis*, are of tender

der temperature, which, though they may be preserved through the winter in a warm greenhouse; they rarely flower, unless the pots are plunged in a good hot-bed, under frames and glasses, towards the time of their respective seasons of flowering. All these sorts, however, succeed best in a stove, and where there are such conveniences, it is eligible culture to indulge the plants with that temperament of heat, when they will not fail to produce their beautiful flowers annually, and the Jacobean Amaryllis often two or three times in that period of time.

All the sorts are propagated by the off-sets, or smaller bulbs, that rise annually from the sides of the main roots, which should be transplanted when their leaves decay, and the off-sets separated for propagation, and planted by themselves, and in two or three years they will attain a due size for flowering, when they are to be managed as above directed.

AMBROSIA.

The plants are chiefly herbaceous. There are six species, of which two only merit consideration.

Class and order, *Monœcia Pentandria*.

Characters.] CALYX, a monophyllous common cup. COROLLA, many male monopetalous florets in the same calyx, and female apetalous flowers in different cups. STAMINA, five filaments in each male floret. PISTILLUM, in each female flower a germen, and style having two long stigmas. PERICARPUM, a leafy capsule of one cell, and one seed.

The species of most note are,

1. AMBROSIA *elatior*.

Taller Mugwort-leaved, Annual Ambrosia.] Ambrosia with doubly-pinnatifid leaves, and branches terminated by paniculated spikes.

2. AMBROSIA *arborescens*.

Tree Ambrosia.] Ambrosia with a shrubby perennial stem, pinnatifid, winged-like, hairy leaves, and the branches terminated by simple spikes.

The first sort is a hardy annual, that attains three or four feet stature, and is of branching growth, producing clustered spikes at the end of every branch.

The *Tree Ambrosia* is a shrubby perennial, which grows eight or ten feet high, branching out upwards; the whole becomes woody, and of several years duration, and flowers annually; the flowers collected in simple spikes, proceeding from the end of all the branches.

The spikes in both sorts are amentaceous, and support both male and female flowers.

Both these species are exotics; the first is of Virginia, &c. and the second comes from Peru. The former succeeds in the common ground,

and may be admitted in the collection of hardy annuals, in decorating the flower-borders; and the second is tender, so must be potted and placed among the green-house exotics.

Their propagation may be effected by seed in a moderate hot-bed, or warm border in March; and the *Tree Ambrosia* may also be raised with great facility by cuttings, which grow freely in a shady border in May or June.

AMELLUS, Star-flower.

Consists of two perennial exotics, garnished with spear-shaped leaves, and compound flowers.

Class and order, *Syngenesia Polygamia Superflua*.

Characters.] The flower is compound and radiated. CALYX, the common cup is roundish, and imbricated. COROLLA, several hermaphrodite florets compose the disk, and loose ligulate female florets the radius. STAMINA, five short capillary filaments, with cylindric antheræ. PISTILLUM, an oval germen, slender style, and two filiform stigmas. PERICARPUM, none; but the seeds, which are oval, and crowned with capillary down, are lodged in the cup.

The species are,

1. AMELLUS *lychnitis*.

Trailing Star-flower.] Hath a bushy trailing stem, with trailing branches, rising two or three feet high, garnished with obtuse downy spear-shaped leaves, placed opposite the branches, are terminated by single flower-stalks, each supporting a violet-coloured flower, with a yellow disk, appearing in July and August.

2. AMELLUS *umbellatus*.

Umbelled Star-flower.] Hath herbaceous upright stems, two feet high, branching at top, and garnished with three-nerved downy leaves, and branches terminating in umbels of yellow flowers.

Propagation.

The first species is propagated by cuttings planted in the summer, and shaded till they are rooted, and afterwards transplanted into small pots to be removed into shelter in winter.

The second species is more tender, may be propagated by sowing the seeds on a hot-bed, and the plants arising planted in pots, and plunged in the bark-bed in the stove.

AMENTACEOUS FLOWERS, from *Amentum*, having that species of calyx or cup called *Amentum*. All Amentaceous Flowers are aggregate, and consist of a great number of minute flowers, and squamæ or chaffy scales, mixed alternately, and dispersed along a slender thread-like receptacle, which hang loosely down like a tail, and from the resemblance of some

some sorts to a cat's tail, has obtained the name of catkin. See **AMENTUM**.

The following genera are of the **Amentaceous** kind.

Birch, beech, hazel, horn-beam, walnut, oak, pine, poplar, juniper, cypress, arbovitæ, willow, &c.

AMENTUM, Catkin; a mode of flowering: defined to be a composition of scaly calyx and flowers, disposed along a thread-like receptacle. The squamæ or scales that form the **Amentum**, mix alternately with the flowers, and resemble the chaff in an ear of corn.

AMETHYSTEA.

Only one known species constitutes this genus; a hardy annual flower from Siberia.

Class and order, *Diandria Monogynia*.

Characters.] **CALYX**, monophyllous, tubulate, bell-shaped, semiquinquefid, permanent. **COROLLA**, monopetalous, ringent border, five-parted. **STAMINA**, two filiform filaments, and simple antheræ. **PISTILLUM**, a quadrifid germen, simple style, topped by two acute stigmas. **PERICARPIUM**, none; four obtuse seeds lodge in the permanent calyx.

The species is,

AMETHYSTEA cærulea.

Blue Amethystea.] Rises with an upright, short stem, a foot high, producing a few small lateral branches at top, with small, trifid, dark-green leaves, and the branches terminated by small umbels of fine amethystine blue flowers of an elegant appearance, in June and July, &c. succeeded by ripe seeds in autumn.

This little annual plant merits a place in the collection of hardy annuals: and is propagated by seed sowed in autumn, as soon as ripe, or in the spring, in the flower-borders, pots, &c. and the plants to remain where sowed, as they do not succeed so well by transplanting.

AMOMUM, Ginger.

The plants are herbaceous exotics, of the East and West-Indies, and are cultivated here in stoves for curiosity.

Class and order, *Monandria Monogynia*.

Characters.] **CALYX** is indented into three parts. **COROLLA** is monopetalous, tubular, and three-parted at the brim, and a nectarium in its bosom. **STAMINA**, one filament, and thick antheræ. **PISTILLUM**, a round germen under the receptacle, a single style, having a hairy stigma. **PERICARPIUM**, a trigonous capsule, having several seeds.

The species are four: those that merit notice are,

1. AMOMUM Zinziber.

Common Ginger.] **Amomum** with naked flower-stems, and an oval spike of flowers.

2. AMOMUM Zernumbet.

Broad-leaved wild Ginger.] **Amomum** with naked flower-stems, and oblong blunt spikes.

The plants grow three or four feet high, are perennial in root, but the stalks and leaves rise in spring, and perish in autumn.

The roots are thick, fleshy, jointed, and spread each way in the earth.

The stalks are reed-like, and grow erect; those of the first rise two feet and a half high, the second above a yard; many such stalks often proceed from the same root, ornamented with leaves placed alternate, their bases embracing the stalks; those of the first are long and narrow, and in the second they are oblong and broader. From one side of the stalks arise the flower-stems immediately from the root, each terminated by the flowers, which are arranged in close, scaly spikes; those of the **Ginger** are blue, the other white.

Both sorts flower in autumn, and in November the whole decays to the ground.

The dried roots of the first species is that well-known aromatic called **Ginger**, being much used for kitchen and medical purposes.

Their propagation is effected by parting the roots early in spring, before they shoot forth new stalks, planting the off-sets in pots of light rich earth, and plunging them in the bark-bed in the stove, giving occasional waterings, which, after they begin to shoot, they will need twice a week.

AMORPHA, Bastard Indigo.

There is but one species, which is a hardy, deciduous, flowering shrub, of tall growth, with long-winged leaves, and butterfly-shaped flowers.

Class and order, *Diadelphia Decandria*.

Characters.] **CALYX** is monophyllous, tubulose, and five-parted at the margin. **COROLLA** is papilionaceous, but the wings and keel are wanting. **STAMINA**, ten filaments connected at their base, and simple antheræ. **PISTILLUM**, a roundish germen, single style, and stigma. **PERICARPIUM**, a moon-shaped leguminose pod, containing two kidney-shaped seeds.

The species is,

AMORPHA Fruticosa.

Shrub Amorpha.] **Amorpha** with long, pinnated leaves, and purple flowers.

This shrub rises ten or twelve feet high, advancing generally with several stems, which branch out irregularly, and produce large soft shoots, ornamented with long-winged leaves, composed of many pair of lobes, and numerous small papilionaceous, dark purple flowers, in long spikes, proceeding from the extremity of the

the young shoots in summer, but it rarely ripens seed in this country.

It is a native of America, where, of its young shoots, was formerly prepared an inferior sort of Indigo.

For uses in gardening, this shrub may be employed to good advantage in assemblage with others in composing large shrubberies.

The propagation of this plant is by seed, and layers of the young branches. The seed is procured from America, and sown in a bed of common earth in spring; the laying may be performed in that season, or in autumn, and by autumn following the layers will be fit to transplant.

AMYGDALUS. The Almond - Tree, which comprehends also the Peach and Nectarine.

According to the Linnæan system of botany, all the sorts of Peaches and Nectarines are retained as species of *Amygdalus*, under which genus we shall also range them; but to render the whole more intelligible for common practice in their cultivation, shall proceed in three divisions, the first division to contain those commonly considered as Almonds; second, the Peach-Tree, *Amygdalus-Perfica*; and third, the Nectarine, *Amygdalus-Nuciperfica*.

Class and order, *Icosandria Monogynia*.

Characters.] **CALYX** is monophyllous, tubular, and obtusely five-parted above. **COROLLA**, five oval concave petals inserted into the cup. **STAMINA**, twenty, or more filaments, and as many antheræ. **PISTILLUM**, a roundish germen, simple style, having a round stigma. **PERICARPIUM**, the germen becomes a large, roundish-oval, downy fruit, inclosing a hard nut or stone, containing one seed or kernel.

First Division.

Of the Almond kind, the following are the principal species and varieties.

1. *AMYGDALUS communis*.

Common Almond-Tree.] Almond-Tree with foot-stalked, sawed leaves, and reddish flowers, in pairs, having the petals emarginated.

Varieties of this are,] Common Almond with bitter kernels.—Common Almond with a tender shell, and bitter kernels.—Common Almond with sweet kernels.

The two following are also supposed to be only varieties of the Common Almond.

2. *AMYGDALUS sativa*.

White-flowered Almond-Tree.] Almond-Tree with linear-lanceolate, sharp-pointed, crenated leaves, and white flowers.

3. *AMYGDALUS dulcis*.

Sweet, Tender-shelled, Jordan Almond.] Almond-Tree with petiolated, short, broader, cre-

nated leaves, and pale red flowers no longer than the calyx.

4. *AMYGDALUS orientalis*.

Eastern Silvery-leaved Almond.] Almond-Tree with spear-shaped, silvery, short, foot-stalked leaves, continuing great part of the year.

5. *AMYGDALUS nana*.

Dwarf Almond.] Almond with low slender stems and branches, and petiolate leaves, narrowed at the base, and sawed on the margin.

Varieties of this are,] Dwarf Almond with single red flowers.—Dwarf Almond with double red flowers.

6. *AMYGDALUS incana*.

Hoary Dwarf Almond.] *Amygdalus* with spear-shaped, sawed, almost close-fitting leaves, hoary-white underneath.

All these species and respective varieties of Almond are deciduous, and of hardy temperature, that prosper in any common soil of a garden. They, considered as fruit-trees, being but of small importance for their production of fruit in this country, are cultivated principally as plants of ornament, for the beauty of their early flowers, which surround all the young branches and shoots in great numbers, and are extremely conspicuous; they come out before the leaves, appearing early in spring, and which, in the *Amygdalus communis*, and *sativa*, are frequently succeeded by plenty of ripe fruit in autumn, which, in all the varieties, obtains an oval form, and large size, is downy, and of a thick, tough, leathery substance, inclosing a large oblong nut or stone, containing a large kernel, which is the Almond, and the only esculent part of the fruit; but seldom attain thorough perfection in England.

The tree kinds flower early in March, and the fruit ripens in September; and the dwarf sorts flower the end of March, and beginning of April.

The *Amygdalus communis* and varieties obtain about fifteen or twenty feet in height, and divides into many spreading branches, which shoot strongly, but in time forms regular spreading heads, adorned in spring with innumerable flowers, arising closely all along the sides of the young branches and shoots, and in a manner covers them, continuing a fortnight or three weeks in full lustre, and make a fine appearance; and when they fade, the leaves, which are long and narrow, come out, and the fruit take their growth.

The several varieties of this species are frequently obtained from the seed or kernels of the same tree, of either sort; that with the sweet kernels is often cultivated as a fruit-tree, for the sake of the said kernels, and when

once

once obtained, the sort is continued with certainty by inoculation. See their *Culture*.

The *Amygdalus sativa* attains twelve or fifteen feet in height, is a moderate shooter, and the flowers small; but being white, numerous, and tolerably conspicuous, they form an agreeable contrast with the common sorts; but the blossoms being impatient of cutting frosts, they are rarely succeeded by much fruit, unless the trees have a sheltered situation, or are trained against a south wall.

The *Amygdalus dulcis*, and *orientalis*, rise twelve or fifteen feet high; they shoot moderately, and produce very small flowers, but rarely any fruit in England.

The two species and varieties of Dwarf Almond are low shrubs, that seldom exceed three or four feet in height; the stems are slender, and send forth numerous feeble branches near the ground, and the single-flowered sort send up many suckers from the root. Both these shrubs have all their young branches closely adorned in spring with flowers, which, being of a fine pale red colour, very numerous, and showy, make a beautiful appearance for about a fortnight, and are some of the greatest ornaments of the spring.

The single sort flowers the end of March, and the double kind early in April, each continuing about a fortnight.

Use in Gardens, &c.

For uses in gardening, these trees are esteemed chiefly for the beauty of their flowers; but some of the tree kinds also demand attention as fruit-trees, and being of moderate growth, they may with propriety be admitted in gardens of any extent.

Those that have the greatest claim to esteem, are the Common Almond, White flowering Almond, the Silvery-leaved, and the two varieties of the *Amygdalus nana*. Of the two former, a few standard trees disposed alternately in shrubberies, or any ornamental plantation, have a fine effect in the spring season, and are particularly ornamental on the boundaries of grass lawns, contiguous to the mansion-house. Some trees dropped singly in different parts of large pleasure grounds will appear to great advantage during their bloom; and after the flower is past, the progress of the growth of the fruit of the two former sorts affords amusement to the curious.

Sometimes curious persons train a few of the Common and White Almond, as dwarfs, or half standards, against walls, or in espaliers, to obtain larger, forwarder, and better flavoured fruit, managing them as peach-trees.

The two sorts of Dwarf Almonds, being shrubs of great beauty during their bloom, are

proper furniture for the most conspicuous compartments of shrubberies, and should occupy places near the front, with shrubs of lowest growth.

The other two species are also cultivated in some curious gardens for variety, especially the Jordan Almond.

Propagation, &c.

The Common Almond and varieties may be propagated either by sowing the stones of the fruit, or any particular sorts, by budding them upon plum, or almond stocks.

With respect to these two methods of propagation, those that are budded sooner form full and regular heads, and they likewise sooner attain a state of flowering and producing fruit; and besides, if it is intended to continue the Sweet Kernelled, or any other particular sort, it can only be done with certainty by inoculation; as when raised from seed they vary, and all the varieties often rise from the fruit of the same tree. The inoculation is performed in July and August, in the usual method, and may be budded either for dwarfs, half or full standards. See INOCULATION. The first shoot from the bud is to be shortened in spring to four or five eyes, that it may put out lateral shoots to form a regular head, and in two or three years after they may be transplanted, either for bearing fruit, or for the purposes of ornament.

The second, third, and fourth sorts are also commonly propagated by inoculation, managing them as above.

To raise these trees from the stones, they should be planted in autumn, i. e. October or November, or in February or March; chuse those of the last summer's growth, and drill them in two or three inches deep, in a bed of light earth: the plants will appear in spring, and in autumn or spring following transplant them in rows in the nursery, where you may train them either for standards, half standards, or dwarfs, according to your fancy. See STANDARDS and DWARF-TREES.

If it is intended to bud any of them, either with Almonds or Peaches, they will be fit for that operation for dwarfs, some the first, and all of them the second summer after transplanting; but for standards they should have three years growth, to be trained with proper stems. See INOCULATION and GRAFTING.

The two dwarf sorts are also sometimes propagated by budding upon plum or Almond stocks; they may also be raised with great facility by suckers from the roots, which the single kind particularly yield in great plenty; or, in default of which, both sorts may also be raised expeditiously by layers.

Second Division.

AMYGDALUS-PERSICA, the Peach-Tree, being the second division of the genus *Amygdalus*. See **AMYGDALUS**.

Class, order, and characters, the same as the *Amygdalus*.

The varieties of Peaches are very great, and by occasionally raising them from the seed or kernel, they may be multiplied indefinitely. It is to be observed, however, that notwithstanding the number of varieties that may be obtained that way, it is probable not one in twenty is possessed of the proper qualities, as is obvious by the cultivated sorts now known in England; for most of the eminent nurserymen retain no more than from twenty to thirty sorts in their catalogues, which they sell as real good peaches. Some indeed extend them to forty or fifty, but among which there are many of very indifferent qualities, and not worth the space they occupy; and since it is not more expense to cultivate the best than the more indifferent ones, the first only deserve our regard; and as all the sorts require to be trained against walls, the expence of building them is very considerable, and a good aspected wall is too valuable to be filled with any but the capital sorts. See **WALLS**, &c.

These fruit are divided into two classes, i. e. Peaches and Pavies; the former are distinguishable by the flesh or pulp readily quitting the stone, that of the latter firmly adheres thereto.

Botanists allow only one distinct species of Peach-Trees: all the different sorts of the fruit are varieties of one another, so that the trees of all the varieties bear the particular marks of the original species; which is,

AMYGDALUS-PERSICA, (*Persica*.)

The Peach-Tree.] *Amygdalus* with sawed leaves, and solitary flowers, sitting close to the sides of the branches.

Varieties of the fruit are,

1. *Early White Nutmeg Peach.*] A very small oblong whitish fruit; ripe middle of July.

2. *Early Red Nutmeg Peach.*] A small, roundish, bright red fruit; ripe end of July.

3. *Anne Peach.*] A small, round, yellowish white fruit, faintly tinged with red on the sunny side; ripe early in August.

4. *Small Mignon Peach.*] A smallish round fruit, red on the sunny side; ripe towards the middle of August.

5. *Great Mignon Peach.*] A large round fruit, swelling on one side, and beautifully spotted with red next the sun; ripe about the middle of August.

6. *Early Purple Peach.*] A large, round, purplish red fruit; ripe middle of August.

7. *Late Purple Peach.*] A fine, large, round, dark red, or purple fruit; ripe middle of September.

8. *White Magdalen Peach.*] A middle-sized, round, whitish fruit, one side deeply furrowed; ripe early in August.

9. *Red Magdalen Peach.*] A beautiful, large, round, red fruit; ripe end of August.

10. *Early Newington Peach.*] A middle-sized, roundish fruit, elegantly red on the sunny side; ripe in August.

11. *Old late Newington Peach.*] A fine, large, round fruit, beautifully red next the sun; ripe middle of September.

12. *Montauban Peach.*] A middle-sized roundish fruit, cleft on one side, and almost wholly of a purple-red colour; ripe towards the end of August.

13. *Belle Chevreuse Peach.*] A middle-sized beautiful red fruit, of an oblong figure; ripe end of August.

14. *Noblesse Peach.*] A very large roundish fruit, finely marbled with a purplish red; ripe beginning of September.

15. *Yellow Alberge Peach.*] A middle-sized, somewhat longish, yellow-fleshed fruit; ripe about the middle of August.

16. *Belle Garde or Galland Peach.*] A fine, large, roundish fruit, almost wholly of a deep purple colour; ripe beginning of September.

17. *Chancellor Peach.*] A large, somewhat oblong, bright red fruit; ripe end of August and September.

18. *Le Teton de Venus, or Breast of Venus Peach.*] A pretty large, somewhat longish fruit, deeply divided on one side, both divisions swelling and rounded like a woman's breast, and of a pale red colour on the sunny side; ripe towards the end of September.

19. *Rossana Peach.*] A middle-sized, somewhat oval fruit, purple next the sun; ripe early in September.

20. *Persique Peach.*] A fine large, roundish, and somewhat oblong fruit, terminated at top by a small nipple, having the sunny side red, the other pale green; ripe early in October.

21. *Admirable Peach.*] A very large, round fruit, beautifully adorned with red next the sun; ripe beginning or middle of September.

22. *Rambouillet Peach.*] A large, longish, deeply-furrowed fruit, the sunny side beautifully reddened, the other yellow; ripe towards the end of September.

23. *La Royale, or Royal Peach.*] A large, round, almost wholly red fruit, but deeply reddened

reddened next the sun; ripe end of September.

24. *Bourdine Peach.*] A large, round, very fine fruit, bright red on the sunny side; ripe beginning or middle of September.

25. *Bloody Peach.*] A middle-sized fruit, deep red next the sun, and its whole pulp of a blood red colour; ripens late in October.

26. *Nivette Peach.*] A very fine, large, longish fruit, deep purple next the sun; ripe middle of September.

27. *Portugal Peach.*] A large, round, even Peach, generally spotted, and the sunny side elegantly reddened; ripe towards the end of September.

28. *Royal George Peach.*] A middle-sized, round Peach, furrowed on one side, of a deep red next the sun, the other part white, spotted with red; ripe early in September.

29. *Violet Peach.*] A middle-sized, roundish, oval, violet-coloured Peach; ripe towards the middle of September.

30. *Catharine Peach.*] A beautiful, very large round Peach, the sunny side wholly of a fine bright red, the other side white; ripens in October.

31. *Monstrous Pavie of Pomponne.*] An amazingly large and beautiful Peach, the shape round, and often measures twelve or fourteen inches in circumference; the side next the sun is deeply reddened, and the other assumes a pale flesh colour; ripe about the end of October.

32. *Cambray Peach.*] A middle-sized, longish, pale-coloured Peach; ripe in October.

33. *Sion Peach.*] A large handsome, round Peach, reddish on the sunny side, the other side whitish; ripe end of September.

34. *Narbonne Peach.*] A very large Peach, almost wholly of a greenish colour; ripe in October.

The above thirty-four varieties of Peaches are the principal sorts of that universally admired fruit, known in Great Britain; and the name here annexed to each variety, is that by which they are generally known to all the nurserymen, who cultivate the trees for sale, to supply noblemen and gentlemen's gardens.

Many of the above varieties approach so near to one another in size, shape, and colour, that it is sometimes difficult to determine their difference without the strictest attention.

We do not pretend to recommend all these varieties as real good Peaches, but for the sake of those who have large extent of walling, have collected all the principal sorts to view, with short descriptions of their sizes, shapes, colours, and times of ripening, which it is

presumed will convey some idea of the respective varieties to the unexperienced, and help to direct him in the choice of the sorts.

The sorts that have the greatest claim to esteem, as the best and most beautiful, both in regard to size, shape, colour, flavour, and the best bearers, are the following.

The Anne Peach, Small Mignon, Great Mignon, Red Magdalen, Belle Garde, Belle Chevreuse, Montauban, Admirable, Early Newington, Late Newington, Bourdine, Nivette, La Royale, Purple, Teton de Venus, Catherine, and Great Pavie of Pomponne; the latter chiefly for its prodigious size and beauty, and, as a pickle, it surpasses all the other sorts.

The two Nutmeg Peaches, though of small size and indifferent flavour, especially the white sort, they, on account of their early perfection, should also be allowed a place in the collection.

The Bloody Peach merits a place more for singularity, than for the quality of the fruit.

The two Newington Peaches, Portugal, Catharine, and Monstrous Pavie, may be deemed of the Pavie tribe, their flesh adhering closely to the stone. The Old Newington and Catharine are esteemed two of the most valuable Peaches that are cultivated in England.

Peach trees in general will grow fifteen or twenty feet high, if they have full scope; and if trained for standards, and permitted to take their natural growth, they form regular heads, but they do not ripen their fruit well on standards in this country, they being natives of a much warmer climate; so that, to effect the ripening of their fruit perfectly, they require the shelter of a warm wall, to which their branches should be regularly trained.

The trees in general flower early in spring; the flowers come out before the leaves, appearing chiefly on the shoots of last year, arising some singly, others in pairs, all along the sides of the shoot, to which they sit close; they are formed each of five small petals, and many stamina in the middle, with a small round germen, which becomes the Peach.

Of their Propagation.

The general propagation of Peach-trees is effected by budding them upon plum stocks.

But all the fine varieties of these fruits were originally obtained from the seed or kernel, and more new varieties may be gained by that means; but as we formerly observed the process is somewhat tedious, and often terminates in but trifling success, in respect to the quality of the fruit so obtained; for if you plant the stones of the finest sorts, it is a thousand

to one, if, out of a great number, you obtain one like the original, and but few that have any real merit, so greatly do these, and indeed most other fruits, vary from the seed. However, for the sake of experiment, there are many who have curiosity and patience enough to undertake the acquisition of new varieties by the above methods, and think themselves amply rewarded if they gain one or two new sorts that possess good qualities in respect to size, form, colour, and flavour.

The method of planting the stones for that purpose, is, they should be planted or sowed in autumn, in October, or November, or preserved in sand till February; sowing them in drills two or three inches deep, and in spring following they will come up, and after having one or two summers' growth, they should in autumn or following spring, be transplanted in rows in the nursery, and in a year or two after, some may be planted against any spare wall, pales, or reed fence, and trained as other Peach-trees; others may remain in the nursery rows; and when they have shown fruit, those of merit should be planted where they are to remain, which you may propagate or encrease by budding, as hereafter directed.

The only method of propagation, however, to continue, with certainty, the approved or any acquired sorts of Peaches, is by budding, i. e. inoculation; since, by inoculating the bud of a tree of any of the kinds, in the stem or stock of any sort of Peach, Almond, or Plum, the bud unites with the said stock, the head of which being cut off, the bud shoots forth, branches out, and becomes a Peach-tree, which will produce fruit in size, shape, colour, and flavour, exactly the same as that of the parent tree from whence the bud was taken, and by which means you may multiply any of the sorts of Peaches, and other fruit-trees at pleasure, and with certainty of the desired kind (see INOCULATION); and besides, trees, thus raised, much sooner attain a bearing state than those from the kernels.

Peaches, as above hinted, may be budded upon three or four different stocks, viz. upon those raised from their own kernels, upon the almond, apricot, and plum. See STOCKS.

There is however but one sort of stock proper for general use whereon to bud Peaches, which is that of the plum; the Peach, the almond, and apricot stocks, are not commonly so prosperous in continuing the trees so long in a good state of full bearing; whereas the plum stock being in every respect hardier, and better suited to different soils, Peaches budded upon them are generally healthful, and of long duration; observing, however, that ex-

perience has proved them to be the most prosperous and durable on one particular sort of plum stock, which is that of the true muscle plum.

The propagation, or raising stocks from the varieties of plums indifferently, as also of Peaches, almonds, and apricots, may with great ease be effected by sowing the stones or the fruit in autumn or February, in drills two inches deep, and they will rise freely the spring following; and in October or November, or spring after, in February or March, they may be transplanted in rows two feet and half distance, and in the two following summers, those that are intended to form dwarfs, may be inoculated with Peach-buds.

But in respect to the real muscle plum stock, this cannot be obtained with certainty, in its true state, from the stones, for they vary so greatly when raised from seed, that probably not one in a hundred will prove of that sort; therefore, the only method to obtain the true muscle kind is either by layers in autumn, or by suckers that are sent up from the roots of Peach or plum-trees, that are known to be worked upon, or proceed from that sort of plum, which should be collected in October or November, or early in the spring; chuse those that are about the size of a large goose quill; cut off any knots of old wood that adhere to their roots, and trim off all side-branches, and plant them in lines two feet and half distance, and in the following summer some will be fit to bud for dwarfs. However, in default of a supply of muscle-stocks, raised as above from layers or suckers, raise them from the stones of the muscle-plum, or occasionally from those, or suckers of other plum kinds; and planted in nursery lines to attain proper sizes for budding.

The proper sized stocks to bud upon to form dwarfs, should be about half an inch to an inch thick.

But if intended to form half or full standards, the stocks, before they are budded, must be permitted to form stems an inch thick at bottom, and four, five, or six feet in height, or more. See STOCKS, NURSERY, INOCULATION, &c.

The season for budding them is August, though some perform that work in June and July; but when budded too early, the buds are apt to shoot the same year, which shoots, being weakly, are either killed in winter, or, if they escape the frost, they never make great progress; therefore, from about the 25th of July to the 25th of August is the proper period for that operation, and the buds will remain dormant till spring, when they will shoot forth with vigour.

The

The method of performing the operation of budding, and every thing relating thereto for those and other trees, is fully explained under that article. See INOCULATION.

We shall therefore only observe, that as Peach-trees require to be trained against walls, &c. they should be budded principally to form dwarfs, that their branches may at first come out low, so as they may by degrees be trained to occupy every part of the wall, from bottom to top; the stocks should therefore be budded within five or six inches of the bottom, but where there are high walls to furnish, it is necessary also to raise some for half-standard and standard wall-trees, to occupy the upper part, while the dwarfs are gradually advancing to cover the whole; the stocks, to constitute such standards, should for half standards be budded at the height of three or four feet, and for full standards at that of five or six, or they may be budded near the ground, and the first shoot from the bud trained to the above heights to form a stem.

Observe to insert only one bud in each stock, the heads of which are to remain on entire until spring.

In March following, the heads of all the stocks are to be cut off sloping, just above the place of insertion of the bud.

Soon after this the buds will shoot forth, each will produce one strong erect shoot, which, by autumn, will probably attain three or four feet in height, and the trees have then acquired their first state of formation, which, in October or November, or in February or March, should be transplanted either against proper walls, &c. in the places where they are finally to remain, or occasionally against some wall, paling, or reed-fence, in order for training them one, two, or three years in the wall-tree manner, to give them the first requisite formation as wall-trees, previous to their final transplanting into their allotted situations; and in either of which methods, they, in the spring, must have the said first shoot from budding, headed down to a few eyes or buds, to force out a supply of lateral shoots below, near the place of inoculation, to give the tree its suitable form for the wall, and in two or three years they will bear fruit. See *Planting the Trees, Heading down, &c. Of the Situation, Aspect, and proper Soil for these Trees.*

With respect to situation and exposure, the Peach-tree being originally a native of warm climates, is, in some respects, tender, and will not prosper, at least, not bear well, in an open situation; so that for the general part, require to be trained against walls.

The trees themselves, though hardy enough in respect to cold, yet the blossom and young fruit are extremely impatient of frost and cutting winds, which generally reign in this country at early spring, when the trees bloom and set their fruit: the trees, therefore, should be indulged with the shelter of a warm wall, or other substantial close fence, to which they should be planted close, and their branches regularly trained thereto, which is necessary, not only to defend the blossom and young fruit the better from the inclemency of the weather, but also that they may have all the advantages of the sun's influence, to accelerate its ripening, as well as to give it colour and flavour, which many sorts, even with all the aid in our power to give, hardly effect in unfavourable seasons in this country.

The proper aspected walls or exposure for the fine sorts, is that of a due south; some may also be planted upon an east aspected wall, and in favourable seasons the trees will also sometimes set and ripen fruit tolerably on a western aspect. However, where there is walling enough, let the capital sorts be always planted against such walls, &c. that enjoy the greatest degree of the south sun, as even that aspect, in some seasons, is barely sufficient to ripen some of the late sorts of these fruit, in any part of this island.

Such of the forward kinds that you desire as early as possible, should have the warmest situation on the best south wall, in which the fruit will be obtained in the earliest season; when, although some of these earlier sorts are inferior in size and flavour, they will prove highly acceptable in the dessert.

With respect to soil, the Peach-tree will prosper in any common soil of a garden, where it is not less than fifteen or eighteen inches depth of proper staple, i. e. such that is proper for the culture of common kitchen herbage, and where moisture is not very copious: but if the depth of good soil in the fruit-tree borders is two or three feet, it will be the greater advantage.

The breadth of the borders against the walls, where it is intended to plant these trees, should never be less than three or four feet, but those of six or eight feet is the most proper width.

If the natural soil of the borders is of a moderately light, pliable nature, and of proper depth, it is a happy circumstance; and if it is of a loamy temperature, it will also be a particular advantage, provided however there is such depth of proper staple as above noticed, before you come at gravel, clay, or any other bad soil at bottom, in which case nothing more than common trenching is necessary; but where there

there is less than that depth, the borders must be raised or deepened with a due portion of good fresh earth and rotten dung, working the whole well together.

Where good rich or pliable loam could be easily obtained from the surface of some contiguous pasture, common, or other field, and with store of rotten dung, working or blending the whole with the natural soil of the border to the proper depth, it would form a fine compost, and the trees will prosper, and be of long continuance.

But if the soil is naturally stiff and clayey, or of any other stubborn or very moist nature, it may be mellowed by adding dry substances, such as light compost, coal ashes, drift sand, road soil, and other similar materials, and plenty of rotten dung, working the whole with the natural soil to the above depth.

Where any one is so happy to possess a soil whose natural goodness renders all foreign assistance unnecessary, no more need be done than trenching the borders one or two spades deep, and it is fit for the reception of the trees. See KITCHEN-GARDEN, BORDERS, &c.

Of Planting the Trees.

The season for planting is October and November, or even any time in open weather till March, in dry warm soils; but in moist or wet soils, we prefer the spring for that work.

Peach-trees, and, in short, all others that are designed for walls, should generally be planted in their places of final destination when they are only one year old, i. e. when their heads are of one summer's growth from the bud, and with their said heads entire for the present, (see *Heading them down*) that we may have the opportunity of training them from their origin, as it were, and in their proper position in the places where they are finally to remain; for the great art in forming a wall-tree depends entirely upon the due pruning and training the two first years, after making the first shoot or head from the budding.

But if any one is in haste to have his walls covered at once, as it were, with bearing trees, he may be supplied with such at most of the nurseries, which are what the nursery-men call trained trees, which they sell from five to ten shillings per tree, according to the sorts, size, and property of growth. Every one may do as they please, but for my own part I always preferred those of one year from the bud; for these reasons, first, that trees of that age sooner and more firmly establish their roots, which is an essential point to keep in view; and secondly, because I would have the tree under my own management from the

beginning, which I always found to be of importance.

The distance these trees should be planted from one another is fifteen feet, and if the walls are high, half or full standards may be planted between the dwarfs, to occupy the upper part while the dwarfs grow up to fill that space, for no part of good walls should be left unoccupied.

The rule is this, if the walls are not above six or eight feet high, plant none but dwarfs, and these at fifteen feet distance; if the walls are nine feet high, half standards, of about three or four feet stem, may be planted between the dwarfs; and if the walls are ten or twelve feet, or more in height, may have full standards, of five or six feet stem, planted to occupy the upper part; and as the dwarfs are to be the principal residents, way must be made, as their branches gradually advance, by cutting away the lowermost ones of the standards by degrees annually, and at last, in seven, eight, ten, or more years, as you shall see necessary, the standards may be entirely taken away, that the dwarfs may advance, and fill the whole space of walling.

The mode of planting being fixed on,—if for a full plantation, mark out on the walls the distances as above for the trees.

Then, having recourse to the nursery, let the trees be taken up with all their roots as entire as possible, for this is of much importance; the extreme ends of all the long roots should be tipped, i. e. a little shortened, and those of broken or bruised ones cut smooth (see *PLANTING*), preserving the heads entire for the present. Holes or pits are then to be opened, capacious enough to receive the roots freely every way. Place the tree therein, about three inches from the wall, with the bud outward, and with the head inclining to the wall, then break and trim in the earth regularly between all the roots and small fibres, and tread the whole gently, to fix the whole plant in its proper position; then directly tack the head to the wall, or tie it to a stake, to secure it from the power of boisterous winds till March, when it is to be headed down. See *Heading Down*.

If the ensuing spring or beginning of summer should prove very dry, indulge the trees with moderate waterings once or twice a week, according to the drought and heat of the season, which will encourage them to push out more freely and strong after heading down.

Of Heading Down, and Manner of Pruning, to give the Trees their due Form.

The trees being planted with their first heads

heads from the bud entire, as we advised; the next necessary culture is to perform the operation of heading them down, which is to be done just as they begin to shoot, and the proper time is March.

This work consists in shortening the head, or first main shoot down within five or six eyes of the bud, or place of its origin, sloping it off on the side next the wall, just above an eye, which is a necessary operation, both to dwarfs, half, and full standards, that are planted against walls; that by stopping its upright direction, it may throw out several lateral shoots from the remaining lower part to the right and left, and constitute the proper foundation for forming a wall-tree, whose first branches should always proceed on both sides, from within six inches of the place of inoculation, whether dwarfs for the lower part, or standards for the middle and top of the wall; and that if the heading down was omitted, the consequence would be, the tree would advance with a naked stem, and leave almost one half of the allotted space of walling unoccupied.

Therefore, pay no regard to the first head from the bud, howsoever large and fine it may appear, but cut it down as above; for the general formation of the tree depends entirely upon the form acquired by this practice, and the two succeeding years' pruning. See *Heading down Trees*.

First Pruning after Heading down.] The trees being thus headed down, they will soon after produce one strong shoot from each remaining eye, observing that such as proceed immediately fore-right from the front and back of the branches are to be constantly rubbed off close, but all those that advance from the two sides are to be preserved entire, which, in June, when of due length to admit of laying in, should be nailed close to the wall, continuing them thereto at full length during the summer.

At the fall of the leaf following, proceed to give them their first winter pruning.

This may be done any time from November till March: you are now to examine the number of shoots each tree produced the preceding summer from the effect of heading down, and to prune them accordingly: for example, if there are two shoots, one on each side, they are both to be retained; and to encourage their furnishing a farther supply of branches, shorten them to eight or ten, or if of very strong growth, to twelve or fifteen inches, and nail them horizontally to the wall.

If there are three shoots, the middle one of which, if irregularly placed too near any one of the others, or of considerably stronger

growth, cut it out close to its origin; and shorten the other two as above, and nail one to each side in a horizontal direction; but if the middle shoot of the three is of moderate growth, and somewhat regularly placed a little distance above the others, it should be retained, shortened, and nailed in uprightly; or if a weakly middle shoot, situated as above, it may be continued, and cut to five or six inches, or, if it discover any blossom-buds, very moderately shortened, or nailed up at full length, and it, probably, will furnish a fruit or two, while the other stronger shoots are providing a farther necessary supply of wood.

If the tree is furnished with four shoots, two on each side, retain them all, and shorten them from ten to fifteen inches, according to their strength, as above, and nail them equally to the right and left.

And if there are five shoots, and that those on the sides are strong, and the middle one weak, or moderate, shorten the former as above, and lay them horizontally, and prune the middle one accordingly, and nail it up regularly; but if the latter is considerably stronger than the others, cut it clean out, which, if left, would draw the principal part of the nourishment, and impoverish those of the two sides, which should now be wholly attended to, for the middle will always furnish itself in due time.

One fundamental rule to be observed, is, that your tree, at this period of growth, should, if possible, proceed with shoots of an equal strength and number on each side, and depends principally upon two or four good branches, shortened and trained equally to the right and left, in a nearly horizontal direction, which will not fail in their turn to furnish you with more to occupy the wall upward. See WALL-TREES.

Second Year's Pruning.] The trees having had their first year's pruning, observe the following rules in their second year's culture.

During summer, all shoots that arise from the upper and under side of the former year's horizontals, are now to be retained and trained entire, and all fore-right shoots that proceed immediately from the front and back part of the said horizontals, should be constantly rubbed off (see *Rubbing off the Buds*), because they cannot be trained consistent with the necessary form and regularity of the tree; having particular regard, however, to reserve all the regular shoots, and train them in at full length; for, except in some particular instances, the shoots must not be shortened in summer; therefore continue them to the wall entire till the winter pruning.

In November, when the leaves are fallen,

or any time betwixt that and the beginning of March. you may proceed to the second winter pruning; in performing this, we, for example, will suppose the tree in the first pruning to have been trained with four horizontals, that is, two on each side, and that each of these produced two or three well-placed shoots the preceding summer, or as many as to make the tree now possessed of eight, ten, or twelve branches; now, if these stand four, five, or six on one side, and as many on the other, it is a happy uniformity; and all of which are to be retained, and that to procure still a farther supply of horizontals, each of the above is now to be shortened according to its strength; if they are weakly, cut them to six or eight inches, and if of middling growth, to ten or twelve, and if very strong ones, to about fifteen or eighteen inches, and train them to the wall horizontally, at six inches distance, observing that the opposite branches of each side range exactly in an equal position.

But where it happens that there are an unequal number of shoots, as for instance, four, five, or six on one side, and seven, eight, or more on the other, and that they are all of tolerable strength; then, to render both sides nearly equal, some of the weakest and worst placed on the fullest side should be cut out.

Observe to proceed as near as possible with an equal number and strength of horizontals in both sides, extending the lowest branches the longest, and if you have now five, six, or eight on a side, trained at four, five, or six inches distance, your tree will begin to assume a handsome form, and next summer you may expect some fruit.

Observations on the general Pruning of these Trees.

Having in the preceding head exhibited the manner of pruning and training, to give the trees their necessary form, and the conducting them to a bearing state, we now come to illustrate the method of general pruning.

The general pruning is performed twice every year, i. e. summer and winter. See their *General Summer and Winter Pruning*.

Previous to the general pruning, observe, that as Peaches and Nectarine-trees always produce their fruit upon the one year old shoots that is, the shoots produced each summer bear fruit the succeeding year, and the same individual shoots rarely bear but once, except sometimes on casual short lateral spurs, of an inch or two in length—nor do the same shoots furnish a regular supply of successional bearing wood, after the first year, which is most generally produced from the year old shoots; so

that the grand article in pruning is to procure an annual succession of young wood in every part, from the very bottom to the extremity every way of the tree, which is to be obtained principally by shortening, in winter pruning, those of every year, whereby they furnish at the same time, both a proper supply of bearing wood, and a general crop of fruit.

The great art in pruning and training a Peach and Nectarine-tree against walls, is to preserve uniformity in every part from the beginning, having strict regard that both sides to the right and left advance with equal strength, and number of horizontals, whose numbers on each side should be equally increased every year, and those trained constantly in a nearly horizontal position, (see *WALL-TREES*), at five or six inches distance one above another, till by degrees they cover the whole space of walling allotted for them, both in breadth and height; for this is very essential to be observed.

After the tree is thus formed and conducted to a bearing state, its duration, beauty, and fruitfulness depends wholly upon proper pruning every summer and winter.

The general summer pruning consists in reforming the irregularity of the numerous shoots then produced, and training to the wall at full length, in every part, an abundant supply of all the regularly placed ones, as succession-wood for next year's bearing; for the great art is to procure a due supply of these every summer in all parts of the tree.

And the general winter pruning comprehends a general reform among all the branches and shoots of all ages, sizes, and situation, such as the retrenching all worn-out and naked branches, as they from time to time occur, to make room for those that furnish the best bearing wood, shoots of the preceding summer; at the same time selecting and retaining in every part the best of the said shoots for next summer's bearing, cutting out unnecessary and irregular ones, and all useless shoots in general, as well as part of the former year's horizontals, to make due room to train the proper supply of successional bearing shoots; all of which should be shortened, to promote their emitting laterals in summer for bearing the year after, and the whole then nailed close to the wall in regular order.

Of the General Summer Pruning.

The time to begin the summer pruning is in May or June. Every one knows that in spring a Peach-tree abounds with a great number of shoots, arising from every side of the last year's horizontals, or present bearers, probably three times more than are useful, or

than

than are wanted; or can possibly be trained in without confusion; you must therefore thin them; and ease the tree of all that are irregular; and such as are evidently useless and superfluous, at the same time retaining a sufficiency of the regular shoots, that is; two or three of the side ones upon each horizontal, to be trained in; to chuse from in the winter pruning; for next year's bearing.

The rule is this: each of the last year's horizontals will probably produce from two or three to six or more shoots; and of these, some proceed from the upper and under sides, and some from the back and fore parts; those of the former situation, i. e. from the upper and under sides, are to be regarded as the only proper regular shoots, and are to be principally attended to, retained, and trained in at full length; to prune upon in winter for bearing the succeeding year; but those that proceed directly foreright from the front, and those from the back of the horizontals, or from any of the other parts of the tree in that irregular direction, must be rubbed or cut off close, because, by their situation on the branches, they cannot be trained with due regularity; and therefore, though good of themselves, they are to be deemed irregular, or useless shoots, and should be every where displaced, except in cases where horizontals furnish no other; when the best placed of them must be retained.

In respect to the regular shoots above described, examine, as you go on, their situation and number upon each horizontal; if two or more shoots rise from the same eye, retain only one of them; and if the tree is but a moderate shooter, it is necessary to disburthen it of all that are evidently superfluous, which are such shoots that, though good and well placed, yet if there are four, five, or more on a horizontal, where only one or two is apparently necessary for next year's bearing, some of the weakest and worst placed, or any remarkably luxuriant ones should be cleared away, retaining however, where practicable, always one or two of the best situated and fairest shoots upon the weak, and two, three, or four, if so many occur, on each of the middling and strong horizontals, which, though double, or even treble of what will be apparently wanted, it is eligible culture to reserve enough to chuse from in winter pruning, training the whole at full length during summer.

But where a tree shoots very vigorously in general, I would advise to reserve as many of the side-shoots of each horizontal as there is tolerable room to train at full length, which, by dividing the sap among many, checks luxuriance, which would probably take place, in a greater degree in a smaller number, for the

natural inclination of these sort of trees, where tending to luxuriance, should in a manner be followed for some time; till reduced by degrees to a more moderate habit of growth; for while that of a vigorous nature prevails considerably, they never can form good bearers.

Another circumstance to be attended to in thinning and regulating the shoots, is to leave one good shoot at, or as near the end of each bearing horizontal as possible, that it may draw the sap through the whole branch to the nourishment of the fruit: and, observing that as many shoots also often arise from the old wood, the greater part should be displaced, except such as are regularly placed, and appear necessary to supply any present or apparent future vacancy, or occasionally to retain, as a reserve, in particular parts of the tree, where room to train them between the mother-branches till winter-pruning, ready in case of any unforeseen vacancy happening.

If any remarkably vigorous or luxuriant shoot arise either from the bearing horizontals, or any of the older branches, examine its situation and strength, and consider whether it is wanted; if it is likely to impoverish the neighbouring shoots of moderate growth, or that it is not immediately wanted to fill a vacancy, cut it out; but if useful, either to fill a vacancy, or to prevent an apparent one, or to exhaust too abundant sap, retain it, and pinch or prune it in May or early in June to four or five eyes, and you will procure one middling shoot from each eye the same year, to train in, to chuse from in the winter pruning.

All those very rank or luxuriant shoots, distinguished singularly from the generality of the others of the same tree, by their extraordinary size, green colour, and often redness at the tips, should be cut out from every part, unless you have no other resource to fill a vacancy, when such as are duly placed for that purpose may be reserved and pinched or pruned short as above observed.

In trees of a weakly state of shooting, retain principally the strongest shoots, and cut out the very infirm growths.

Attention should always be had in general to the bottom or lower part of the trees, especially those that are aged; if any strong shoot arise in those parts, you must preserve it carefully to succeed casual worn-out or naked branches, which are occasionally cut away by degrees; and if there is a present vacancy, where two or more shoots are apparently necessary, may pinch or prune it early in June to four or five eyes, to furnish lateral shoots the same year, to be ready against the winter pruning.

Where a vacancy or want of wood is discovered,

covered, at this time, in any part, and that there is only one shoot where two, three, or more are necessary, shorten the said shoot to three, four, or five eyes, in May or early in June, and it will afford as many laterals the same year to fill the vacant space.

In the whole operation of summer pruning, observe, that all the regular shoots you judge necessary to retain to prune upon in winter, must be left entire, shortening none now, except in cases of vacancy as above, and all irregular and other useless shoots that are now to be taken out, must be rubbed or cut off as close as possible, leaving no stumps, which would shoot out from every eye, and fill the tree with innumerable useless shoots, and choke up and darken the fruit, and deprive it of the necessary benefit of sun, air, showers, &c. and which would require much time to cut out in the winter pruning.

It is necessary to observe, that if the above operations are begun early in summer, the shoots that are to be displaced, may readily be rubbed off with the thumb; but observe, if you delay the work till the wood begins to harden, they will not break off easily without damaging the mother-branch, therefore use the knife, and cut them as close as possible.

After the above regulations, let all the remaining shoots, when of due length, be trained close to the wall unshortened, and as their ends advance, continue to train them still along at full length, and which are to remain entire until the winter pruning; for in the common course the shoots must never be shortened in summer.

These are nearly all the directions we have to advance relative to the summer pruning, the utility of which, if the operation is performed in due time, is very great both to the trees and fruit.

Therefore, if the operations are begun early in May, only just rub off all the ill-placed buds, that is, foreright ones, and those behind the bearing horizontals, and such others as appear evidently useless, as formerly observed; and in June, when the useful or regular shoots are of proper length, they are easily and expeditiously trained in, for every one points to its proper place; besides, when the work is begun early, it can be performed with considerably more expedition and truth, as the useless buds or shoots may then with the utmost facility be rubbed off close with the thumb, but when more advanced, must always use the knife: and the early operation will contribute very considerably to the size and goodness of the fruit, as well as beauty and duration of the trees.

The work however should never be delayed longer than the beginning of June, or till the shoots have attained due length for training in, and not, as is often the case, wait till they are two or three feet in length, and form such a thicket and confusion, that the most expert pruner would be at a loss to know where to begin to break through such obscurity, to determine what is necessary to be done, which, besides, is highly prejudicial to the prosperity of the fruit, the main object, as well as to the beauty and duration of the tree; and the confusion occasioned by such a thicket of wood and leaves prevents you from cutting close, and the tree becomes full of disagreeable stumps, producing useless shoots from every eye, which take up much time to remove in the winter pruning; and upon the whole the fruit being hidden, choked up, and as it were buried behind such a thicket, becomes tender, as is evident from the colour, which is rather white than green, and when thus suddenly laid open to the air, joined to a scorching sun, great part of it withers and drops off, which never happens when the fruit has from the beginning been inured to the weather, by early rubbing or cutting off the useless, and training close the useful shoots, so as to give the sun and air free admission; but on the contrary the fruit always excels in size, colour, and flavour.

At this time of summer-dressing, i.e. June, &c. we recommend the following observation, which could not be so discoverable at the earlier dressing, viz.

Where short shoots, of an inch or two in length, appear upon this or the former year's horizontals, or sides of the old wood, and that they apparently will not exceed that length, it is of utility to reserve them, at least till the winter pruning, because they may prove natural fruit-spurs, which, at that season, is distinguishable by having a cluster of blossom buds. See the *Winter Pruning*.

If a vacancy is any where discovered early in summer, you may pinch or prune some of the strongest neighbouring shoots to three or four eyes, and they will furnish you shoots the same year, to chuse from in the winter pruning. See *Pinching the Shoots*.

Do not pull off any of the leaves at this time, as often practised, with a view to admit the sun, for these are necessary to the growth, both of the young shoots and fruit, so should never be taken away, unless there is indeed in any part so great a thicket as to darken the fruit considerably, when a little thinning may be necessary; in other cases that work must be dispensed with till the fruit are full grown.

After the trees have been summer-dressed, according to the preceding directions, you must not forget to review them once a fortnight, to take off any unnecessary or straggling after-shoots that may arise, which is soon done, and to fasten up any shoot that may start from its place, or project from the wall, as well as to continue the trained shoots in general thereto, as they advance in length.

One thing more, which is necessary to observe in the summer dressing, is the blight which sometimes attacks these trees: this disorder is the effect of noxious winds or blasts, occasions the leaves to crumple or curl up, become thick, clammy, yellowish, red, and scabby; and attacks the ends of the shoots, and proves very injurious both to the young shoots and fruit, and often their destruction; exhausts, or stops the progress of the sap, in the particular infected parts; wholly retarding the growth, and soon communicates the malady throughout the tree, except it is stopped by using some timely means of prevention as much as possible; though the only immediate remedy is principally, as soon as your trees appear attacked, to pick off all the most infected crumpled leaves, so far as discoverable, and also cut off below the disorder, all the infected part of the shoots, which generally assume a rough disagreeable bushy-like appearance; this enables the sap to push out new shoots lower down, for next year's bearing. So destructive is this infection, that it frequently destroys in a short time the whole leaves of a wall-tree; and when these are gone, the principal part of the fruit soon after follows, which generally withers and drops, as likewise the young wood, for next year's bearing, either dies or becomes stunted. Various other methods have been tried to prevent the spreading of this pestilence, but nothing effectual.

Insects also often prove very injurious to these trees; being generally the effect of blights; and sometimes proceeds from some infirmity in the state of the trees, numerous small vermin attacking the leaves, which thereby discover a curled or crumply appearance, and the shoots whereon they are situated, as also the fruit, become stunted, and make no progress in growth: to remedy which, as much as possible, should pull off the worst of the infected leaves; and, if very dry, hot weather, it would be of advantage to dash the trees abundantly with water, by means of a garden watering-engine; also to strew tobacco dust over the general branches; or sometimes, to destroy the vermin, a fumigating bellows is employed, containing burning tobacco; the smoke of which issuing from the pipe in a

stream, applied to the trees, suffocates the insects: but as the smoke soon escapes, or evaporates in the open air, it is a tedious process, and not so effectual as in a place where the fume is confined.

Sometimes these, and other wall trees, &c. are attacked with a dry blight, or blast, which at once kills the branches or shoots so attacked, and for which there is no remedy; and all that can be done, is to cut out the parts so affected as soon as discovered.

As the blights are, in a manner, accidental, sudden, and different, no previous means of prevention can be used. See FUMIGATION, INSECTS, &c.

Of the General Winter Pruning, &c.

The winter pruning may be executed any time from the fall of the leaf in November, until the beginning of March; for no weather has any particular effect with regard to proving injurious to the new-cut shoots, as sometimes imagined.

This work however should never be delayed till late in spring, because the blossom-buds will be so very turgid or swelled, that numbers of them will be unavoidably rubbed off in performing the operation of pruning and nailing; though some wait till this period, that they may better judge of the good or bad buds, and of the wood-buds from those that produce blossom and fruit. This is of some importance: but the sap is generally risen sufficiently in January, or sooner, to swell the buds, to enable you to distinguish them.

As these trees always bear their fruit upon the one year old wood; that is, the shoots produced each summer bear the general supply of fruit the summer following, so that the fruit-buds are principally to be looked for upon these shoots.

Wood-buds are distinguishable by their being long and slender; blossom or fruit-buds are round, swelling, thick, and soft, and arise both singly, or one at an eye, and some double or twin, two together, often having a shoot-bud between them; and the singly-placed ones have also sometimes a wood-bud at the same eye, and are all equally eligible, either with or without the appearance of an immediate shoot-bud: and the latter more generally arise distinct.

Great attention must always be had to keep every part of the tree well furnished with an annual supply of young wood, of the former summer, for bearing next year, advancing, as it were, gradually one under another, from the bottom to the extremity every way; which is easily acquired by properly selecting, thinning, and shortening those of every year, and by cutting out annually some of the old horizontal

izontals to make room for them. Likewise observe, that as the bottom of the trees is apt to become naked, be also watchful of that part; to retain in proper places an annual supply of strong young wood, either to fill an immediate vacancy, or to be trained up gradually between the mother branches, to supply the place of any naked or worn-out branch, that may happen either there, in the middle, or upper part; which are such that support little or no young wood, or produce very weakly and but a scanty portion of shoots, and should, wherever they appear, be cut down to the great branch from which they proceed, or to any lower more fruitful branch, or strong young shoot they support, or to any convenient branch supporting such shoots: and part of the old horizontals must always be cut out annually, to make room to train in the bearing wood.

Previous to the performing the operation of winter pruning these trees, as they must undergo a general regulation, it is eligible to unnailed the greater part of the branches, and all the young shoots in general; you then have full liberty to examine the state and situation of the whole, as well as to have due command in using your knife, and of nailing the tree again in regular order, according to the situation and strength of the general supply of young shoots necessary to be retained for next summer's bearing, &c.

The trees being unnailed as above, you should first proceed to examine all the principal branches, and see if any are become naked, or worn out. Naked branches are such that, as formerly hinted, have advanced a considerable length, and support very little or no good bearing shoots, or lateral branches furnished with such wood, and should be cut out to their origin, provided there are proper young wood, or horizontals, well furnished with such shoots, properly situated to be trained up to supply their places; for way must always be made for those branches that furnish the best young wood, both for bearing the following summer, and providing a further supply of shoots for future service. And the casual worn-out branches are easily distinguished by their uncommonly weak shooting, so should be cut out as above, to make room to extend those of better growth, as just observed.

From these you pass to regulate the shoots of the year; that is, those of the preceding summer; of which you will find often, on the same tree, weak ones, middle-sized ones, and some of very luxuriant growth; those of the middle size are to be principally attended to; observing, as noticed in the summer pruning, that the proper shoots for our present purpose

to train for the general supply of next summer's bearers, are principally those that grow upon the one year old horizontals, and of which we are now to select and retain the most regular placed ones, i. e. such that are the most properly situated for training close and nearly to the wall, which are chiefly those that proceed from the two upper and under sides of the said horizontals, and occasionally such well-placed ones as grow on the older wood, in all vacant spaces; so that, keeping in view the proper shoots, cut away all the irregular, superfluous, and other useless and unnecessary growth, as hereunder mentioned.

Suppose your tree to be chiefly of moderate growth, and here and there in it shoots of superior luxuriance and rankness; these, where-ever situated, must be cut out close: but if the tree is, in general, vigorous or luxuriant, the shoots must only be thinned in a moderate way, as hereafter directed.

All shoots of extreme weakness should be cut away, unless you shall see it necessary to keep one here and there to fill a vacancy, or as a reserve in case of one the future year, in which latter case I would now cut them down to an eye or two.

I do not comprehend by weak shoots those short ones an inch or two long, which I call natural fruit-spurs, and often furnish excellent fruit, and must be retained.

All fore-right and other ill-placed shoots, such as proceed directly from the front and back of the branches, and in other irregular directions, that cannot be trained consistent with the uniformity of the tree, and arising either from the young or old wood, are also to be cut off close, except in cases of vacancy, and that there is no other resource.

Cut away all stumps of last summer, and leave none now, cutting every thing close.

During the whole operation of the above reforms, great attention must be observed in selecting and retaining all the well-placed regular side-shoots above described, which must be regulated according to the following rules.

Proceeding in this manner to clear your tree from casual worn-out branches, and from luxuriant, irregular, and other bad shoots, leaving nothing but useful branches supporting horizontals, furnished with proper young wood, nearly of equal strength, and you see your work clear; you have nothing now to do but select and retain upon each horizontal a due portion of the best placed of these proper shoots, and retrench the superfluous ones.

Examine therefore the number of proper shoots upon each horizontal, and their strength, keeping in mind, that the middling strong ones are

are to be principally attended to. We advised in the summer pruning to leave upon each horizontal two, three, or four shoots, according to the strength of the tree in general: now, if your tree is fully trained, no more than one or two, as you shall see necessary, need be left upon each horizontal, except in cases where a tree is very luxuriant, or where there is a very wide space to fill, or a vacancy in its neighbourhood, may leave more occasionally; but if the tree is still in training, you may retain two or more shoots upon each bearer, as you shall judge expedient, to forward the tree to its intended form. But suppose you are upon a full-trained tree, or such that are nearly so, and that you judge one of the young shoots on each horizontal is sufficient, keeping in view they should be trained about four, five, or six inches distance; on this consideration you are to select the best of the middle or lowermost of these shoots, unless you shall judge necessary to advance the length of the branch; then chuse the best of the uppermost, cutting out the superabundant; observing that whatsoever shoot you fix upon, to cut off the upper part of the horizontal on which it stands, close to the said shoot; or if you leave two or more shoots upon each horizontal, let one be near the upper, and the other near the lower part thereof, on the opposite sides, where they occur so situated, and cut down the horizontal to the uppermost of the two shoots, so that by cutting away part of each of the former year's horizontals, the remaining part is terminated by a young shoot, which now commences the bearer or horizontal of the ensuing year.

Observe, where two or more shoots arise from the same eye, never leave but one.

Where any shoot rises from the sides of the old wood or main branches, and which you shall judge necessary to retain, either to fill a present vacancy, or to be ready for an apparent one, it may be reserved without shortening down the said branch to it, as is necessary in the one year's horizontals, unless that part of the said branch immediately from the shoot upward is naked, or unfurnished with young wood, in which case take it down to the shoot in question.

Those short shoots or natural spurs, an inch or two long, above observed, may be retained wherever they appear, for they are generally well furnished with blossom buds.

Observe, that many of the principal bearing shoots which you now retain, will have probably put out several small twigs or side shoots; these, being produced late, are generally spongy, besides, being superfluous or unnecessary, must be cut close, leaving only the main shoot.

In cutting out the irregular and superfluous wood in general, cut all close, leaving no stump, which would send out shoots from every eye the ensuing summer, and crowd your tree with useless wood; and any of those short natural spurs of the former year, now devoid of blossom-buds, or that exceed two or three inches in length, should now also be cut away close, but especially such that advance directly foreright.

As you proceed in making these reforms of regulating and thinning, observe, at the same time, to shorten the remaining select shoots, the utility of which is obvious; for as these trees always produce their fruit upon the one year old shoots, the same wood, by proper shortening in winter pruning, furnishes, as well as fruit, lateral shoots in proper places the following summer, to bear the fruit the year after that; therefore, to procure an annual supply of young wood in the proper parts, we must not omit stopping or shortening, less or more, that of each year in the winter pruning, by which each shoot will emit two, three, or more lateral ones the succeeding summer; whereas, if they were left at full length, the sap which would have thrown out shoots below, would mount to the extremities, and leave the bottom bare, and in a short time all the lower part of the tree would become naked, and furnished with bearing wood only towards the extreme parts. The rule of shortening is this; if the tree is in health, and of a middling free growth, shorten or cut off about one third of the length of each shoot; for instance, shoots of ten or twelve inches should be shortened to six or eight; those of about fifteen or eighteen inches shorten to eight, ten, or twelve; and so in proportion to the length and substance of the respective shoots, observing, where a tree is weak, or on the decline, and makes weakly shoots, to leave the shoots thin, and cut them shorter in proportion: on the contrary, where a tree is in general a vigorous shooter, leave the shoots closer, and shorten them but moderately: that, by retaining a good deal of wood to divide and exhaust the great redundancy of sap, you may the more effectually reduce a luxuriant tree to a state of moderate growth, and to bear plentifully.

In shortening these shoots, it is of importance to cut them just above a wood or branch-bud, that it may produce a shoot for a leader, to draw the sap through the whole horizontal, the more effectually to nourish its respective fruit. A wood bud is with facility distinguished from a blossom-bud; the former is long, narrow and firm; the blossom buds are roundish,

roundish, thick, swelling, and soft; so that by cutting to a wood-bud, you are sure of a leading shoot, and the fruit will be well-nourished; in which, however, have regard not to shorten below the general supply of blossom-buds on the particular or respective shoots, especially as it may be observed, that they sometimes proceed from the same eye with a shoot-bud, which is equally eligible both in the single or twin blossoms: in the latter, a shoot-bud often issues from between; and, therefore, if you cannot conveniently cut to a wood-bud separately, make the cut to a blossom-bud as above.

Thus much for the general directions to be observed in the principal winter pruning, although there are other circumstances that cannot be conveyed by words, nor judged of but upon the spot, and depend chiefly upon practice.

We will however subjoin a few other particulars very necessary to be observed.

In the course of practice, you will meet with trees of very different habits of growth; some, for instance, are weakly, and produce small or weak shoots; others are of a middling state, shoot freely in every part, but not too vigorous, which is the most desirable state of growth of any; and some shoot very vigorous in almost every part. With respect to the former, if the tree makes very weak shoots, examine whether the defect is at the root: if it discovers a decaying state, and is apparently irrecoverable, pull it up, and plant another in its place; but if not decayed in the root, preserve it, and dig in some fresh loamy earth and rotten dung incorporated therewith, which often recovers these sort of trees, observing to keep it thin of wood, and prune the shoots short, even the best to five or six inches, till it recovers. In the second case, the middling shooting tree is to be managed as in the general directions. And in the third instance, if the tree is remarkably vigorous, and bear little, it should in some degree be humoured in its own way; for if you cut out many, and shorten considerably the remainder of these very vigorous shoots, where they are general, as is frequently done, supposing by that practice to check luxuriance, and so continue to prune, and depend entirely upon the smallest ones, the consequence is, that by much thinning, and close cutting vigorous trees, they continue to shoot still with greater vigour and irregularity for several years, without being able to gain either form or fruit, till at last, by severe pruning, they pass into the opposite extreme, become, as it were, tired with acting ineffectually, grow very weak and sickly, and shoot no more. On the con-

trary, by following, in some degree, the inclination of the tree, leaving the shoots as close as there is any tolerable room to lay them in, and shorten them very little, some of the strongest not at all; and by thus leaving a good deal of wood, and that at a considerable length, the sap is divided, and the luxuriance is checked; and in a year or two your tree will become a moderate shooter, and furnish fine young wood, and bear plentifully.

The Method of nailing them.

The trees being pruned, they should be directly nailed to the wall; this however should always be done as you go on, that is, as soon as one tree is pruned, let that be nailed before you prune another.

This operation is sufficiently explained under the article WALL-TREES and NAILING: we shall just observe, that as your trees having, previous to the pruning, been entirely unnailed, you have the opportunity of nailing the whole with the greatest regularity, observing to bring the lowermost branches on each side down horizontally, and train them along perfectly strait, and so much horizontal, that the extremities be but a few inches higher than the bottom, especially where the side extent of walling and distance between the respective trees admit; and in which must be guided in extending the branches more or less horizontally: nail them close, proceeding in the same manner with the next immediately above them; and so of all the rest, making the opposite principal or mother-branches on each side, range nearly in the same position, preserving on each side an equilibrium of number and strength, observing nearly the same of their respective horizontals or bearers, training them strait and regular, at four, five, or six inches distance from one another, observing if the pruner has left in any place more wood than can consistently be now laid in, the nailer must regulate that according to his discretion, by either cutting out entirely such superfluous or unnecessary shoots, or take it down to one eye to furnish a shoot for another year, if he shall judge it of utility.

Of defending the Blossoms.

Peach-trees come into blossom early in spring, when cutting frosts prevail, which, in some seasons, are so severe as to cut off the whole. Not only the blossom is liable to this disaster, but also the young fruit, till they are as large as ordinary cherries, which obliges us to have recourse to all possible means to defend them, especially as many trees of the principal sorts as possible.

The dangerous time lasts a month or six weeks; various ways have been tried to shield the trees during that period; such as covering them

them with large garden mats, which I have often found of great use; but where there is much walling, it takes up much time to cover and uncover, as the danger threatens, for they must only be used when there is apparent danger: free air, light, and sun, must be admitted, so that if the mats are nailed up in an evening when there is an appearance of a cutting frost, they should be removed again in the morning, if the weather is quite mild; but if not, they may be permitted to remain till it is moderate: do not omit however to take them down when the weather changes; and so continue their use only occasionally, till your fruit is advanced to the size of large peas at least.

This is the principal expedient in practice to defend these trees, which sometimes proves effectual, but at others does not secure us a quarter of a crop; it however should not be omitted in hazardous times, especially to some of the early and choice sorts.

There is another method which sometimes saves a few fruit, when all that have been fully exposed are cut off; this is to procure a quantity of cuttings from the branches of evergreen trees, such as those of laurel, yew, spruce-fir, &c. that are well furnished with leaves, and stick them moderately thick between the branches of the Peach-tree, in a spreading manner, so as the leaves of the cuttings cover the blossom: these should be placed just before the blossoms begin to open, not too thick to darken them, and may be permitted to remain, constantly night and day, until the beginning of May, when the fruit will be set, and past danger. In default of the above cuttings, I have used branches of dried fern; also sometimes large old fishing-nets, suspended from above, before the trees, which breaks off part of the keen edge of the frost, and cutting frosty winds, permitting them to remain constantly till the fruit is well set, and a little advanced in growth, as above.

Neither of these methods of covering, nor indeed any other, can we recommend as generally effectual; but a poor expedient is better than none; they often insure a few fruit, when those that are fully exposed are all destroyed by the frost.

Thinning the Fruit.

In favourable seasons Peach and Nectarine-trees sometimes set their fruit very thick in every part, often double or treble the quantity that have room to grow, or the trees capable of nourishing, and frequently the fruit are set only here and there in clusters; in either case they must be thinned, otherwise the fruit will not attain half its common size, and during

their growth would thrust one another off; besides, if the trees are overloaded, they would produce but very weakly shoots for next year's bearing, and would be two years before they recovered themselves.

This work should be performed when the fruit have attained nearly the size of small cherries, which will be about the beginning or middle of May, for if you thin them sooner, frosts may destroy the remainder, and you have no resource left.

The rule of thinning is, if the tree is weak the fruit must be left thin, not more than one or two on the larger shoots, and only one upon the smaller, which is the only way to insure handsome fruit, and proper wood for another year: upon trees of a middling strong growth you should retain but one or two fruit upon the smaller shoots, and two or three upon the middling-sized ones, and three upon the strong shoots: but the smallest kinds of fruit may be left a little thicker in proportion, and the large sorts should be thinner, i. e. about five or six inches distance upon each shoot, and the largest sort of fruit six or eight inches apart. In performing this work, observe to select and retain the best placed, largest, and fairest fruit, in every part, according to the above rule; and in removing the superabundant ones, be careful not to disturb the remaining fruit. Leave no where two or more upon the same eye, especially if one exceeds the other in size, taking off the smaller, which the other would starve: but if they are of equal size, you may, if it shall seem necessary, leave both of them.

We formerly observed, that it was of utility to preserve always a proper coverture of the leaves in all parts of the trees, being essentially necessary to the prosperous growth of the fruit, and to afford a moderate shade and defence thereto during its principal growth, and till well advanced in size; when, if the leaves anywhere form a very thick dark shade, may thin off some moderately, or when the fruit is full grown, or begins to change colour, it is necessary, in that state of perfection, where the leaves are very close, to pinch off some in a thinning order, in such as immediately cover the fruit, to admit the sun to give it colour and flavour.

Do this however regularly, and thin the leaves by degrees, which should be pinched, and not torn off, which would mangle the eyes, and prevent the fruit-buds from forming themselves for next year.

General Observations.

Peach-trees, from the time of heading down to the sixth or seventh year, may be said to be

in a state of training, though they frequently begin to bear the second or third year after the operation of heading down; and in five, six, or seven years will bear pretty plentifully, according to their size, for they will not have attained their full growth till they are ten, or twelve years old, according to the extent of walling they have to cover, at which age they will be arrived at the beginning of their ultimate state of vigour and perfection of bearing, which they generally acquire between the seventh and fifteenth year, and in which they will continue for twenty or thirty years to come; for these trees, with due management, will endure fifty or sixty years, provided no accidents happen, such as violent blights, or tainted with gum, or attacked by vermin; so that the opinion of some, that Peach-trees are seldom of more than twelve or fifteen years' duration, is erroneous, and must be given up, for it is owing only to bad management that they do not last as long as other wall-fruit-trees.

The trees may be said to be in their third state when they begin to decline through age; but if our general directions in pruning are observed, this seldom happens until they are upwards of thirty or forty years old, when they should be cherished by leaving only the best young shoots, and that moderately thin, and which should be pruned shorter than the general rules, and make the most of strong young wood that rises from or near the bottom, to supply the place of worn-out branches.

When it is observed any trees approach near their end, and the bottom of the walls becomes naked, young trees should be planted in due time in the spaces between the old ones to succeed them, and as they shoot up lop off the lower branches of the old trees, which in four or five years may be taken entirely away; thus you may keep your walls always occupied, without intermission.

It sometimes happens that the trees do not bear fruit of the approved or desired sort, which is often the mortifying circumstance when purchased in some nurseries, and a very cruel one, after all the trouble of training, &c. To remedy this, you, in August, may bud some of the young shoots of the same year, in different parts of the tree, with buds of the desired sorts, and as these advance cut the other parts away, and in two or three years they will spread considerably, and bear fruit.

If the gum has attacked any shoot of a tree, young or old, cut it off an inch below, to stop the communication, and prevent killing the whole shoot.

The utility of tillage to these trees is very

obvious, and should be performed every autumn and spring by digging the borders.

Dung, in moderation, is also of the utmost utility in preserving due vigour and health in these trees, and to promote the size of the fruit; let it be perfectly rotten, and added every two or three years, spreading it all over the border, and dig it in in the usual way.

As to cultivating kitchen herbage on the borders, the moderate growing sorts, such as radishes, lettuce, small salad herbs, kidney-beans, a few small early mazagan beans, dwarf peas, &c. do very little or no injury to the trees.

Peach and Nectarine-trees are often planted in forcing-frames and hot-walls, to produce early fruit; the sorts proper for this are the earliest kinds: for the method of performing it, see **FORCING-FRAMES** and **HOT-WALLS**.

Of planting these Trees for Ornament.

There are two varieties of Peach-trees that are esteemed chiefly by way of curiosity and ornament, which we judge it most proper to speak of under a separate head. These are, the

Double-blossomed Peach-tree.—**Dwarf Peach-tree.**

The former of these has great beauty in its double flowers; it attains the height of common Peach-trees, and differs in nothing from them but in the doubleness of its flowers, which, like those of the others, are succeeded by fruit: the tree makes a fine appearance in ornamental plantations.

The Dwarf Peach rises but two or three feet high; the stem is small, and hath very slender branches, which produce small insipid fruit, the size of a nutmeg. It is sometimes planted in pots, and brought to table with the fruit growing thereon for curiosity, and makes an agreeable appearance.

For purposes of ornament, any of the sorts of Peach-trees may, with propriety, be admitted as standards in the shrubbery, and will make a fine appearance when in bloom, and if they stand in a sheltered situation, there will be a chance of having now and then some fruit from them: they may either be planted as standard-dwarfs, or as half or common standards.

The propagation of the Double-Blossomed and Dwarf kind is effected by budding, as directed for the common Peach-trees.

Third Division of Amygdalus.

AMYGDALUS-NUCIPERSICA, the Nectarine Tree.

Class, order, and characters, the same as the Amygdalus.

The Nectarine and Peach-trees have been generally considered as distinct species, principally by the difference of their fruit; but late

disco-

discoveries has determined otherwise, and that they are found to be varieties of one another, but which is the original is not yet agreed on; but certain it is, that there have been instances of Nectarines growing naturally on Peach-trees, accompanied by Peaches on the same branch; which very singular phenomenon determines them to be varieties of one species.

Neither the trees, by their manner of growth, the wood, leaves, nor flowers of Nectarines and Peaches, can with any precision be distinguished from one another; but the fruit is distinguishable at sight in all its stages of growth: that of the Nectarine hath a smooth firm skin or rind, and the Peach is covered with a soft downy matter; the flesh too or pulp of the Nectarine is considerably firmer than that of Peaches.

Their temperature and general culture is the same in every respect.

However, as they are generally considered as different fruit, we, for distinction sake, range them in separate divisions, though all under the principal genus *Amygdalus*.

The varieties of Nectarines that merit esteem are,

1. *Fairchild's early Nectarine.*] A small round Nectarine, of a bright red on one side, the other yellow; ripe beginning or middle of August.

2. *Violet Nectarine.*] A middle-sized fruit, purple on one side, the other of a yellowish green, tinged with red; ripe latter end of August.

3. *Elrouge Nectarine.*] A middle-sized longish Nectarine, purple or dark-red on one side, the other yellow, and the rind becomes shrivelled, and the pulp separates from the stone; ripe end of August.

4. *Newington Nectarine.*] A large beautiful Nectarine, being of a fine scarlet or bright red on one side, the other changing gradually to a bright yellow, and adheres to the stone; ripe beginning or middle of September.

5. *Red Roman Nectarine.*] A fine large, round, dark red Nectarine, assuming a yellowish hue on one side; the whole becomes somewhat shrivelled, and adheres to the stone; ripe middle of September.

6. *Temple Nectarine.*] A middle-sized longish Nectarine, pale red on the sunny side, the other a yellowish green, and separates from the stone; ripe middle of September.

7. *Tawny Nectarine.*] A middle-sized roundish fruit, of tawny red on one side, the other a dusky yellow, and adheres to the stone; ripe in September.

8. *Scarlet Nectarine.*] A middle-sized, wholly red, beautiful Nectarine, the sunny

side being scarlet, the other a pale red colour and adheres to the stone; ripe beginning and middle of September.

9. *Brugnon, or Italian Nectarine.*] A large fruit, deeply reddened next the sun, and yellowish on the other side, and parts from the stone; ripe in September.

10. *Golden Nectarine.*] A middle-sized round Nectarine, faintly reddened on the sunny side, the other parts are of a golden yellow; and adheres to the stone; ripe late in September.

11. *Murphy Nectarine.*] A middle-sized fruit, of a dusky purplish red on one side, the other a yellowish green, and adheres to the stone; ripe beginning or middle of September.

12. *Virmash, or Peterborough Nectarine.*] A middle-sized, round, greenish Nectarine; ripe middle or end of October.

13. *White Italian Nectarine.*] A middle-sized handsome fruit, of a whitish yellow colour, and good flavour; ripe in September.

Of the above thirteen varieties of Nectarines, if you would cultivate only the best, I should advise to plant the following. Fairchild's Nectarine claims a place for its early perfection. The Violet and Elrouge Nectarines are pretty fruit, ripen freely, and their flavour is rich and vinous. The Newington and Roman are the largest, most beautiful, and best flavoured Nectarines in the world. Temple Nectarine is also a very good fruit, and is well esteemed; and the Virmash or Peterborough Nectarine merits a place in the collection, because it ripens late, and furnishes a variety for the dessert after all the others are gone: also the White Nectarine, both as a good fruit, and as a curious variety.

The Nectarine-tree is in temperature and manner of growth, in every respect, like the Peach, and like that tree requires to be trained against the walls, and in the same aspect and soil.

Its propagation also, and whole management in all its stages of growth, is the very same as the Peach-tree.

Therefore, to avoid unnecessary repetition, the reader is requested to turn to the *Amygdalus-Perfica*, or Peach-tree, for the method of propagation, planting, pruning, and every other article of culture, where an ample direction, equally applicable to the Peach and Nectarine, is given.

AMYRIS, Sweet-Wood.

A genus comprising balsamiferous shrubs for the stove.

Class and order, *Oleandria Monogynia*.

Characters.] CALYX, monophyllous, four-toothed, acute, small, and permanent. Co-

COLLA, four oblong concave spreading petals. STAMINA, eight awl-shaped erect filaments, with oblong antheræ. PISTILLUM, an ovate germen above, style thickish, crowned with a four-cornered stigma. PERICARPIUM, a roundish drupaceous berry containing a roundish, shining nut.

The principal species are,

1. *AMYRIS elemifera*.

Gum Elemi-tree.] Rises a branching shrub six or seven feet high, garnished with ternate and pinnate five-lobed leaves, downy underneath, and small white flowers from the axils of the leaves at the ends of the branches. The resin of this shrub is the Gum Elemi of the shops.

2. *AMYRIS gileadenfis*.

Balsam of Gilead-tree.] Rises a shrub with purplish branches, garnished with ternate entire leaves, and lateral one-flowered peduncles. From the buds of this shrub is the Balsam of Gilead extracted.

3. *AMYRIS Opobalsamum*.

Balsam of Mecca-tree.] Rises a shrub branching out, and garnished with winged leaves, and leaflets petioled flat; with flowers produced on the shoots of the same year's growth.

This last species is supposed to give forth the rare and valuable resin called Balsam of Mecca.

These shrubs, being tender, require to be constantly kept in the stove; their propagation is by seeds obtained from abroad, or by cuttings in the spring, with the assistance of a hot-bed, and managed as other plants of the like nature.

ANACARDIUM, Acajou, or Cashew-Nut.

There is but one species; it is of the tree kind, a native of both Indies, and retained here in stoves for curiosity.

Class and order, *Decandria Monogynia*.

Characters.] CALYX, five sharp-pointed deciduous leaves. COROLLA, five long, narrow, reflexed petals. STAMINA, ten short filaments, and roundish antheræ. PISTILLUM, a roundish germen, inflexed style, and oblique stigma. PERICARPIUM, none; the receptacle becomes a large round pulpy substance, crowned by a kidney-shaped nut.

There being but one species, it is named simply *Anacardium*.

This tree appears as a small shrub here in our stoves; but in the Indies it rises twenty feet in height, dividing into spreading irregular branches, decorated with large oval leaves, and small white flowers in umbels at the ends of the shoots, succeeded by a large yellow

pulpy receptacle, crowned by the fruit, which is a kidney-shaped nut, an inch long, containing an eatable sweet kernel, very palatable when roasted.

The propagation of this plant is by planting the nuts, which are brought hither annually by the West India ships.

They are to be planted singly in small pots, and plunged in the bark-bed; and the plants will appear in a month; continue them always in the stove.

ANAGALLIS, Pimpernel.

The plants are herbaceous, one of which is the common trailing annual Pimpernel, a weed of the garden and fields; and one is an erect, small, ornamental perennial of the green-house.

Class and order, *Pentandria Monogynia*.

Characters.] CALYX is monophyllous, five-parted and permanent. COROLLA is monopetalous, wheel-shaped, and five-parted. STAMINA, five erect short filaments. PISTILLUM, a globular germen, simple style, and headed stigma. PERICARPIUM, a globular capsule, and many angular seeds.

The species that merits culture is,

ANAGALLIS monelli.

Perennial Anagallis.] Anagallis with erect stalks, and spear-shaped leaves.

This is a low erect perennial, a foot high, somewhat bushy, and closely adorned with leaves, by pairs, or by threes, and numerous wheel-shaped blue flowers on long foot-stalks, which make a pretty appearance.

The propagation of this plant is either by seed on a warm border in April, or by cuttings in the shade in summer, and must be potted and housed in winter; shift them occasionally into larger pots, removing them each shifting with the ball of earth entire about their roots, and give moderate waterings in common with other woody exotics of that department.

ANAGYRIS, Stinking Bean Trefoil.

This genus furnishes two hardy deciduous flowering shrubs, adorned with oval leaves and long spikes of papilionaceous yellow flowers.

Class and order, *Decandria Monogynia*.

Characters.] CALYX, a monophyllous, bell-shaped, five-parted cup. COROLLA is papilionaceous, the standard broad and heart-shaped; the wings oblong and plane; and the keel long and erect. STAMINA, ten distinct filaments, and simple antheræ. PISTILLUM, oblong germen, simple style, and hairy stigma. PERICARPIUM, a large oblong pod, containing kidney-shaped seeds.

The species are,

1. *ANAGYRIS fœtida*.

Common Stinking Anagyris.] Anagyris with oval

oval leaves and spikes of flowers, proceeding from the sides of the branches.

2. *ANAGYRIS cretica*.

Cretan Stinking Anagyrus.] Anagyrus with oblong leaves and longest spike of flowers.

These shrubs rise eight or ten feet in height, decorated with simple, alternate, hoary leaves, and numerous bright yellow butterfly-shaped flowers, disposed in long hanging spikes, arising from the sides of the branches in May and June, but rarely perfect good seeds in England.

They are exotics of Spain, Italy, and the Archipelago Islands, but prosper here in the full ground.

The propagation may be effected both by seed and layers.

The seed is procured from abroad by the nursery-men and seeds-men, which should be sown in a bed of light earth in March, and the plants will appear in May; give occasional waterings in summer, and shelter the first winter from severe frost; in March or April following plant them in a warm sheltered situation, or some in pots, and in two, three, or four years they will be of due size for the shrubbery.

ANANAS, the Pine-Apple. See *BROMELIA*.

ANASTATICA, Rose of Jericho.

Consists of low bushy annuals of curious singularity; adorned with obtuse and acute leaves, and small tetrapetalous white flowers, disposed in short and longer spikes.

Class and order, *Tetradynamia filiculosa*.

Characters.] CALYX, four-leaved, leaves oval-oblong. COROLLA, four roundish flat petals, spreading cruciform. STAMINA, six awl-shaped filaments with roundish antheræ. PISTILLUM, a very small bifid germen, subulate style and headed stigma. PERICARPIUM, a short, blunt, bilocular pod, with a single seed in each cell.

The species are,

ANASTATICA hierichuntica.

Jerichoan Common Anastatica, or Rose of Jericho.] Anastatica, with short ligneous stalks, five or six inches high, dividing into many branches of bushy growth: obtuse, fleshy leaves, and short lateral spikes of small white flowers; native of Palestine, &c.

ANASTATICA syriaca.

Syrian Anastatica.] Anastatica with a forked hard stem a foot high, spreading branches, acute rough leaves, and longer spikes of small white flowers.

Of the above two species, the first is the most generally known; noted for its great singularity, which is, that in autumn, when

it begins to decay, it contracts itself; and if then taken up and preserved in a dry place till next year, nay for many years, then placed in warm water, it will expand its leaves and flowers as in its natural growth.

Both the species are raised from seeds in March or April, in a hot-bed, and in May the plants may be potted and placed in the full air; they will flower in June, and, with occasional shelter of a frame, will perfect seeds in autumn.

ANCHUSA, Bugloss.

There are eight or nine species, all of which are herbaceous, chiefly perennial, and of hardy growth; some grow erect, others trail, garnished with rough simple leaves, and monopetalous funnel-shaped flowers; four or five of which merit culture, some as salutiferous medical plants, others for ornament.

Class and order, *Pentandria Monogynia*.

Characters.] CALYX is acutely five-parted, and permanent. COROLLA, monopetalous, funnel-shaped, and five-parted at the brim. STAMINA, five short filaments, and incumbent antheræ. PISTILLUM, four germina, a filiform style, and obtuse stigma. PERICARPIUM none, the four seeds being lodged in the calyx.

The species of most note are,

1. *ANCHUSA officinalis*.

Common officinal Bugloss.] Anchusa with erect stalks, spear-shaped leaves, and imbricated spikes of flowers.

Varieties of this.] Common Bugloss with blue flowers.—Common Bugloss with white flowers.—Common Bugloss with red flowers.

2. *ANCHUSA sempervirens*.

Ever-green broad-leaved Bugloss.] Anchusa with trailing branches, broad leaves, two leaves on the peduncles, and short spikes of blue flowers.

3. *ANCHUSA orientalis*.

Eastern Yellow Bugloss.] Anchusa with trailing branches, hairy woolly leaves, the branches and flowers growing alternately, and oval bracteal leaves on the spikes between the flowers.

4. *ANCHUSA virginiana*.

Virginian small Yellow Bugloss.] Anchusa with a low smooth stalk, and bright yellow flowers, placed in loose spikes.

All these are herbaceous perennials, that prosper in almost any soil and exposure, though they are of longest duration in dry soils.

The two first sorts grow naturally in Britain, but all the others are of foreign growth.

The roots of all the sorts are fibrous.

The stalks and branches are round, thick, and mostly very rough and hairy, decorated with

with simple, oblong, very rough leaves, placed alternate; and numerous flowers, collected into clusters and spikes, ornament the upper parts, each separate flower formed of one inundibuliform or funnel-shaped petal, having a long tube below, and a spreading brim, appearing, in the different species, in spring, summer, and autumn, and continue in long succession on the same plant, which, in all the sorts, are succeeded by abundance of seed in autumn.

The *Anchusa officinalis*, and respective varieties, obtain two feet in height, sending forth many side shoots, and a numerous succession of flowers in June and July.

The Evergreen Bugloss and *Oriental Anchusa* extend their branches upon the ground, which furnish a succession of flowers most of the summer months, and the former often continues in bloom from May till Christmas.

The *Virginian Anchusa* is a very low plant, but is valuable for its producing numerous flowers early in spring.

Use in Gardens, Propagation, &c.

In respect to their uses in gardens, the Common Bugloss is esteemed principally for its medical properties; but all the varieties may also be employed with the other species as plants of ornament, for the embellishment of the compartments of large gardens, where many plants of easy culture are required; where, though the flowers possess no remarkable beauty, they will appear conspicuous enough to increase the variety.

All the sorts love a dry soil; for though they grow strongest in moist rich land, yet their duration in such soils is rarely more than two or three years.

The propagation of all the sorts is by seed, in autumn or spring, in a bed of light earth, and in May, June, or July, the plants will be large enough for transplantation into the places where they are finally to remain.

All the sorts rise freely from the scattered or self-sown seeds.

ANDRACHNE base Orpine.

This genus consists of two species, one of which is herbaceous and trailing, and the other a shrubby exotic.

Class and order, Monœcia Gynandria.

Characters.] Male and female flowers apart on the same plant. CALYX, cut into five parts. COROLLA of the male consists of five emarginated narrow petals, with a nectarium composed of five semibifid folioles. STAMINA in the male flowers, are five small filaments inserted into the rudiments of the style, topped with simple antheræ. PISTILLUM, a globose germen with three slender

styles, topped with round stigmas. PERICARPIUM, a globose trilobate three-celled capsule, containing two or three-cornered seeds.

The species are,

1. ANDRACHNE Telephoides (Annual).

Bastard Orpine.] Hath trailing herbaceous branches, garnished with oval lanceolate leaves of a dirty green colour: the flowers are white, and appear in July and August.

2. ANDRACHNE fruticosa.

Shrubby Andrachne.] Hath a shrubby stem, branching laterally, and forming a head four or five feet high, with smooth, oval, entire leaves, and erect flowers.

The first species being annual, the seeds may be sown in the spring, where it is to remain.

The second species hath the branches placed alternate on the stem with the small branches compressed; the flowers are axillary and clustered together.

Its propagation is by seeds or cuttings: the seeds may be sown in the spring on a hot-bed, in pots filled with light rich earth plunged to the rim; and when the plants are risen two or three inches high, plant them in separate pots, and plunge them in the bark-bed, where they may be constantly kept and managed as other plants of the same nature.

By cuttings chuse some of the shoots, plant them in pots of rich earth and plunge them in a hot-bed; when they have taken root remove them to the stove where they are to continue.

ANDROGYNA Planta. By botanists a plant is termed Androgynous, which produces both male and female flowers on the same root; the cucumber, melon, gourd, &c. and of trees, the oak, platanus, chestnut, walnut, mulberry, birch, hornbeam, hazel, &c. furnish examples. See *Masculus Flos*, &c. Androgynous plants constitute the class *Monœcia* of Linnæus.

ANDROMEDA.

The plants of this genus are principally of the tree and shrub kind, mostly deciduous, hardy, and of moderate bushy growth, adorned with simple alternate leaves, and small monopetalous bell-shaped flowers, in spikes, or clusters.

Class and order, Decandria Monogynia.

Characters.] CALYX is acutely five-parted, coloured, and permanent. COROLLA, one bell-shaped petal, cut into five reflexed segments. STAMINA, ten short filaments affixed to the corolla, and two-horned antheræ. PISTILLUM, a roundish germen, long permanent style, and obtuse stigma. PERICARPIUM, a pentagonal capsule of five cells, containing many roundish seeds.

The

The principal species are,

1. *ANDROMEDA arborea.*

Tree Andromeda, or Carolina Sorrel-Tree.] Andromeda with oblong, oval, pointed, alternate leaves, roundish oval greenish flowers, disposed in long naked spikes, proceeding from the sides of the branches.

2. *ANDROMEDA paniculata.*

Paniculate-spiked Virginia Andromeda.] Andromeda with oblong, crenated, alternate leaves, and cylindrical yellowish flowers, in branching naked spikes at the ends of the branches.

3. *ANDROMEDA mariana.*

Maryland Aggregate Andromeda.] Andromeda with oval entire leaves, placed alternate, and greenish flowers, collected in aggregate bunches.

Varieties.] Ovate-leaved Andromeda.—Oblong-leaved Andromeda.

4. *ANDROMEDA calyculata.*

Calyculated Box-leaved, Canada Andromeda.] Andromeda with obtuse, spear-shaped, punctured, alternate leaves, and cylindrical white flowers, disposed in short leafy spikes at the ends of the branches.

Variety.] Calyculated oval-leaved, evergreen Andromeda—Globe-flowered calyculated Andromeda.

5. *ANDROMEDA racemosa.*

Racemose-spiked Pennsylvania Andromeda.] Andromeda with oblong serrated leaves, and cylindrical swelling flowers, in clustered bracteal spikes.

6. *ANDROMEDA polifolia.*

Polium-leaved Marsh Andromeda.] Andromeda with oblong elliptical stiff-leaves, edges reflexed; and oval nodding, reddish flowers.

Varieties.] Broad, oblong-leaved,—spear-shaped-leaved—Narrow linear-leaved.

7. *ANDROMEDA Dabæcia.*

Irish Whorts, or Cantabrian Heath, or Trailing Andromeda.] Andromeda, with low trailing stalks and branches; leaves spear-shaped, revolute, alternate, and larger purplish flowers.

8. *ANDROMEDA acuminata.*

Acuminate-leaved Andromeda.] Andromeda with ovate, lanceolate, acute leaves, edges sawed.

9. *ANDROMEDA coriacea.*

Coriaceous thick-leaved Andromeda.] Andromeda with three-cornered branches, and ovate, entire leaves, very thinning.

These plants are mostly natives of North America, where they grow naturally in marshy or boggy places; the first of which is somewhat impatient of severe frost, but all the others are very hardy, and prosper best in moist situations.

The tree *Andromeda* rises ten or fifteen feet in height, the branches slender and drooping; this is somewhat tender; so some plants should be retained in pots to be sheltered in winter.

The *Andromeda paniculata* is a shrub of three or four feet stature, and sends forth many branches.

The other species of *Andromeda* are low bushy shrubs, rarely exceeding two or three feet in height.

All these shrubs flower here annually in June and July, but they rarely ripen seed in these parts.

Uses, Propagation, &c.

With respect to the utility of these shrubs in gardens, the first sort is admitted principally among the green-house plants, and delights in moisture; the other sorts may be admitted to increase the variety in the shrubbery; but they should have a moist soil, otherwise they will not prosper in summer.

The propagation of all the species may be effected by seed, which is imported by the seedsmen annually from America, which must be sown in spring in a bed of moist earth.

They may also be increased by layers in autumn.

All the shrub kinds may also be propagated by suckers, which they send up pretty plentifully every year from the roots.

ANEMONE, including the Pulsatilla, or Pasque-Flower, and the Hepatica.

In this genus, Anemone, the Pulsatilla, and Hepatica, now retained as species thereof, were formerly ranged as distinct genera; but late improvements in botany have proved their general characters to be the same, and proclaim them all relations of the same family, and as such we must treat of them; though, as they differ extremely in their general appearance, as also in their culture, we, for distinction's sake, will exhibit them in separate divisions, under the generical name Anemone. See ANEMONE-PULSATILLA, and ANEMONE-HEPATICA.

Class and order, *Polyandria Polygynia.*

Characters.] CALYX, none. COROLIA, six or nine petals, disposed in two or three series. STAMINA, numerous capillary short filaments, and double antheræ. PISTILLUM, numerous germina collected into a head, pointed styles, and obtuse stigmas. PERICARPIMUM none; the seeds, which are numerous, rest on the receptacle, and form an obtuse cone.

The above characters are applicable, not only to the species commonly considered as
Anc-

Anemones, but also to the Hepatica and Pulsatilla.

First Division.

In this division we will exhibit the principal species of what are commonly called Anemones.

The species are,

1. ANEMONE *coronaria*, *angustifolia*.
Narrow-leaved Garden Anemone.]

Anemone with the radical leaves divided and subdivided by threes, into many narrow segments, and a leafy involucre.

Varieties.] The varieties, in respect to the colour and variegation of the flowers, are innumerable; but the principal plain colours are, red, blue, crimson, purple, ash-colour; and the variegations are, red and white, rose and white, blue and white; red and white and purple, with innumerable intermediate shades; and with single and double flowers, of every colour and variegation.—Proliferous narrow-leaved Anemone, one flower growing out of another.

2. ANEMONE *hortensis*, *latifolia*.

Broad-leaved Garden Anemone.] Anemone with digitate or hand-shaped fingered leaves, having broad segments.

Varieties.] Flowers of many colours and variegations, as in the first species.

3. ANEMONE *nemorosa*.

The Wood Anemone.] Anemone with leaves divided by threes, having the segments deeply cut, and one flower on the stalk.

Varieties.] Common Wood Anemone with single white flowers.—Double white Wood Anemone.—Purple wood Anemone.—Double purple Wood Anemone.—Reddish-purple Wood Anemone.

4. ANEMONE *apennina*.

Apennine Blue Wood Anemone.] Anemone with ternate divided leaves, having the segments deeply cut, and numerous spear-shaped petals to the flower.

Varieties.] Common Apennine Wood Anemone, with single blue flowers.—Double blue Apennine Wood Anemone.—Violet-coloured Apennine Wood Anemone.—Double violet-coloured Apennine Wood Anemone.

5. ANEMONE *ranunculoides*.

Ranunculus like, Yellow Wood Anemone.] Anemone with divided leaves, segments deeply cut, numerous, roundish petals to the flower, seeds acute, and stem mostly one-flowered.

All these species and respective varieties are hardy herbaceous perennials, that will prosper in any common soil of a garden, either in beds separately, or in the borders among other plants of the flowery tribe.

They are perennial in root, but annual in leaf and stalk, which rise in spring, and perish to the ground when they have flowered and perfected seeds.

The roots are tuberous, knobbed, solid, fleshy, and firm; the leaves rise on foot-stalks directly from the root, and which, in all the sorts, are simple, but are cut into many narrow parts, the divisions being generally by threes; and between the leaves rises the flower-stalk, from five or six inches to one foot in height, surmounted each by one flower, which stands naked without any cup or calyx, and which, in the single kinds, has generally from six to twelve petals, but in the double sorts the petals are of an indeterminate number, which are often so numerous and full, as to exclude the parts of fructification; but the single and half-double kinds afford plenty of seed annually.

General Description of the Garden kinds.

The two first species, *Anemone coronaria*, and *Anemone hortensis*, are the Eastern or Garden Anemones, and the parent plants of all those numerous beautiful different coloured single and double varieties that adorn our gardens in spring, and beginning of summer; they are originally natives of the Levant, and other parts of the East; but grow freely with us in the full ground, with little trouble, in beds or borders, and furnish an annual succession of their beautiful flowers six weeks or two months, and produce abundance of seed annually, and their roots multiply exceedingly.

Their roots, as before hinted, are tuberous, knobbed, irregular, and formed into unequal knobby heads.

The leaves are simple, large, and decomposed, which, in the first sort, *Anemone coronaria*, and all its varieties, are deeply divided into many segments, and these again subdivided into numerous narrow divisions; so, for distinction, this species is called Narrow-leaved Anemone. The second sort, *Anemone hortensis*, and varieties, has also large, simple, decomposed leaves, which are digitate or fingered, but the divisions are not so deep, and the fingers or segments being broader than those of the former, it is called Broad-leaved Anemone.

The flower-stalks of both species, and respective varieties, rise between the leaves directly from the roots, frequently two, three, or more, from the same root, and obtain from about eight or nine to ten or twelve inches in height, and a little above the middle grows a leafy appendage, called the involucre, and at top stands one large conspicuous flower, which,

which, in some varieties, is as large as a double rose. In their single state the flowers have only six or nine petals, but in the double kinds they are innumerable: six large petals compose the outward part; in the midst stand numbers of smaller ones, in a great many circular series, filling up the body of the flower in a globular tuft, which, by florists, is called the thrum.

In the single and half double kinds rise a vast cluster of thread-like stamina, and in the centre of these are the rudiments of the seed, formed in a small roundish head.

But in the full double flowers, all those parts of fructification are often entirely obliterated by the multiplicity of the petals, so that the seeds are to be expected principally from the single and semi-double flowers.

The common single kinds, i.e. with six or nine petals with the cluster of filaments in the middle, are commonly called Poppy Anemones, from their similarity to a single poppy.

General Description of the Wood Anemones.

The five species of Wood Anemones growing naturally in woods in most parts of Europe, some are found in similar situations in this country, particularly the first sort, which is found plentifully in many parts of the kingdom, in their single state; but the double sorts of them have been obtained by culture in gardens from the seeds of the single kinds.

The roots of these species, and varieties, are fleshy, oblong, and irregular; run under the surface, and send forth many fibres.

The leaves rise from the root on long foot-stalks; they are pretty broad, and divided into three or five principal parts, and these again deeply cut on the edges.

The flower-stalk rises from six to eight or nine inches high, having a leafy involucre, and each stalk crowned by one pretty large flower, which, in its single state, has generally six pretty broad petals, in two series, with a cluster of stamina, and a head of rudiments of seed in the centre; but the double flowers have innumerable small loose petals, forming a globular head, and are very pretty.

Use in Gardens of all the Sorts.

The two first species, and their numerous train of varieties, are very pretty ornaments for the flower-garden, and the double kinds have superior beauty; the varieties in general are curious furniture for embellishing the fronts of the principal compartments of the pleasure ground, as they will prosper in the common open borders, &c. in which they have a fine effect, when properly disposed in

assemblage with plants of similar growth and times of flowering; for they blow freely in any common light earth, and nothing injures them but over-abundant moisture of soil; and sometimes late frosts in April and May deface the thrum that composes the middle of the flower; but this is seldom.

However, as the capital sorts are often procured at a great price, and some are of singular beauty, it is eligible to plant the best of them separate in narrow beds, in order that when the plants begin to shew bloom, they may be arched over to be covered with garden mats, when cutting winds and frosts prevail.

But I should advise to plant many of the common kinds in the open borders towards the front, in small clusters, of three, four, or five in each; in which order the flowers will be very showy, and produce a fine variety for six weeks or two months.

The principal season of flowering of all the double varieties is April and May; but by planting the roots at different times in autumn and spring, the bloom may be continued from March until the middle of June.

The broad-leaved kinds are generally the hardiest blowers, and if some are planted late in March, in a somewhat shady border, they will exhibit a bloom in July.

All the choice double kinds should be taken up annually when the flower is past, in order to separate the increased parts or offsets which arise from the sides of the main roots, and which, if taken up just after the flower fades, may be retained out of ground several months, and planted according to the time you design they shall blow.

The Single or Poppy Anemone comes very early into bloom, often in January and February, and its flower, though composed but of six petals, is large and showy, and is worthy of a place in the common borders, where, if disposed four or five together in patches, alternately with bunches of snow-drops, crocuses, winter aconites, hepatics, and Christmas roses, they will exhibit a fine variety at an early season, and the roots may be permitted to remain two or three years unremoved.

The Wood Anemones are fine furniture for the borders of wood-walks, the fronts of shrubbery clumps, and for wilderness works, and in short, for any other compartments where a variety of early bloom is required, for they will succeed any where.

Method of Planting the Garden Kinds.

The roots of all the varieties of the two species of Eastern or Garden Anemone are sold

by the nurserymen, and at most of the seed-shops. The fine double varieties are generally imported from Holland, which are sold by the hundred, &c. The common kinds, both double and single, by the pound weight.

The Dutch sorts are per hundred from eight or ten shillings to so many guineas, which however is more than they are worth.

The common double English kinds are sold per lb. from five to ten or twelve, and the single or Poppy Anemones from three to five shillings.

The season for planting all the above varieties, is according to the time it is designed they shall flower.

The best time to plant the principal sorts for the general bloom is October, or early in November, and the plants will come into flower in April and beginning of May; but if some are planted in the middle of September, and a second parcel towards the middle or latter end of October, both plantations will afford a succession of bloom from the beginning of April until the middle of May; and if a third plantation is made in February or beginning of March, they will come into flower about the middle of May, and continue until the middle of June; whereby the bloom may be continued near three months.

In respect to the above times of planting these roots, observe, that those planted early in autumn often come up in leaf before Christmas, and they always produce the largest flowers, and continue longest in beauty; the roots too will be better nourished, and afford a larger increase than those planted in spring.

It is however necessary always to retain some out of ground till spring, for the sake of a succession of bloom.

The situation proper for the Anemone should be free from copious moisture, and the exposure should be open to the sun and free air, and unincumbered by the shade of trees, which should be particularly observed for the blow of the capital kinds.

In regard to soil, the Anemone will prosper and flower in tolerable perfection in any common moderately light earth of a garden, only observing to avoid planting them in over-moist and stiff soils, which would rot the roots in winter; and if any augmentation is necessary to raise or form the beds or borders for their reception, no more is needful than common light mould from the quarters of the kitchen garden, or any other well-wrought garden earth, working the whole one good spade deep.

Professed florists, however, in order to blow the capital sorts in their ultimate state of beauty, often prepare composts of different in-

gredients wherewith to form beds for the reception of the roots.

The best is that of fresh earth from a pasture, neat's dung, and sea-sand. Take maiden loamy earth from the surface of a common or other pasture field, the top-spit turf and all; to every load of this add one of neat's dung, and half a one of sea or drift-sand; blend the whole together, and form it in a ridge, in which let it remain a year or six months at least, turning it over every two or three months (see COMPOSTS). But in default of pasture earth, a good compost may be formed of common light garden mould, and rotted neat's dung, adding to every load of the former half a one of the latter, and about a quarter of that of drift or sea-sand; and of either of these composts the bed is to be formed, about twelve or fifteen inches in depth, and three and a half broad.

The mode of planting is to be observed according to the following rules.

If it is designed to plant any of the common double and single kinds in the borders, in assemblage with other plants, I should advise to plant them in patches, that is, to plant three, four, or five roots together, in a patch of five or six inches breadth, putting them two or three inches deep; and those patches may be five, ten, or fifteen feet distance, some near the edge, others more towards the middle; in which order they will make a pretty appearance.

But when it is designed to plant them, in the florists' way, in beds by themselves, they must be planted in continued ranges, lengthways.

The beds for this purpose are to be marked out three feet and half broad; the length at pleasure, with alleys eighteen inches wide between bed and bed. The beds must be worked or prepared one full spade, or fifteen or eighteen inches deep; break the earth small, but do not sift it, observing, that to prevent lodgment of wet, and to give the beds a good appearance, as well as to shew the flowers to the best advantage, it is eligible to elevate them three inches above the common level or general surface; but if there is danger of moisture standing in winter, double or treble that is proper height, working the whole a little rounding, and rake the surface smooth; then put in the roots.

In each bed plant six rows lengthways, the roots at six inches distance in each row, and two or three inches deep; and when one bed is planted, run over it lightly with the rake, to reform all inequalities, and make the surface smooth.

The

The roots being planted, those of the early autumn plantation will come up in leaf in November; but as the plants are hardy, nothing is needful to be done till the flower-buds begin to appear; and then, if you think proper to bestow a little care on the capital sorts, by arching the bed with hoops, in order to cover it with mats occasionally, to protect the early flower-buds and advancing bloom from cutting black frosts, which often prevail in March and April, they will flower in greater perfection; though this is only advised on particular occasions, as above, as the plants in general are hardy enough to stand our ordinary weather, and flower abundantly well in their proper season.

Or any principal varieties may occasionally be planted in pots, three or more roots in each, in order for moving them in their said pots, when in flower, to adorn any place required; or some pots planted in autumn or winter may then be placed in a green-house, or garden-frame, &c. during the last-mentioned season, to flower earlier in the spring; or if admitted in a hot-house, may obtain them in flower at the earliest season; and for which occasion may plant some roots in pots in October, December, &c. and towards Christmas, or before, or soon after, placed in any hot-house apartment, they will flower very agreeably at the most early period, January, February, and March.

Their Propagation.

All the varieties are propagated by off-sets from the root, and new varieties are obtained from seed.

But first of propagating them by parting the off-sets.

By off-sets, all the kinds increase exceedingly every year; so the roots of all the capital kinds, at least, should be taken up annually at the decay of the leaf, and the root may be divided or broken into as many off-set knobs as are furnished with an eye or bud, and every such part will readily grow, and produce a flower exactly like that of the parent root the spring following; observing, however, that if they are divided very small, they will flower weak the first year; therefore, if you would have strong flowers from the main root, only break off those small ones that are slightly affixed thereto; but they should not be thus divided until autumn, or near the time for planting them again.

The time for taking up the roots is in May and June, when the leaf and stalk are withered, for then the roots cease to grow for a month or six weeks; but if they are permitted to stand to put forth fresh fibres again, they should not be removed that season.

They should be taken up in dry weather, and spread in an airy place out of the sun, about a week, then cleared from earth, and put up in bags or boxes till the planting season arrives, they will keep good several months.

The above work should always be performed annually to the capital kinds, both for the sake of increase, and to fresh dig and prepare the beds.

By propagation by seed, all the beautiful varieties were, and continue annually to be obtained.

The process is not very tedious, for the plants will flower the second or third year.

The seed may be had at the shops; but if you save it yourself, it should be from the best single or semi-double flowers; the full doubles afford none. The time to sow it is March or April, either in boxes, large pots, or wide earthen pans, of perfectly light compost, or in a bed of such earth; sow it moderately thick, and cover it near a quarter of an inch deep with sifted mould: from this time occasional shade from the scorching sun, and moderate waterings in dry weather is necessary, and in six weeks the plants will appear, keeping them clear from weeds; and when the leaves decay, sift a quarter of an inch of earth over the bed, which is all that is necessary till the second summer, when they are to be taken up at the decay of the leaf, and managed as the old roots in the manner already directed; and next spring they will flower and discover many new beauties, and among them many that are very ordinary, which will do for the common borders.

The propagation of the Wood Anemone is by dividing the roots any time after the decay of the leaves in June until October, though the sooner after the fall of the leaf, the better.

At which time the common sorts may be transplanted from the woods.

The other species of less note are,

1. ANEMONE *virginiana*.

Virginian Wood Anemone.] Anemone with a branching stalk, producing long alternate flower-stalks, small whitish flowers, and cylindrical spikes of hairy seeds.

2. ANEMONE *dichotoma*.

Forked-stalked Canada Anemone.] Anemone with a forked stalk, trifid cut leaves, sitting close, growing opposite, and embrace the stalk.

The first grows a foot high, the other almost double that height; the flowers are white, small, and of no great beauty. They may be raised from seed, or by dividing the roots.

Second Division of Anemone.

ANEMONE-PULSATILLA, the *Pulsatilla* or Pasque-Flower.

The *Pulsatilla* has been always considered as a distinct genus, till the Linnaean botany justly declared all the sorts species of the Anemone.

The plants are herbaceous, hardy perennials, of the flowery tribe, that produce annual stalks ten or twelve inches high, each surmounted by one large flower, bearing great resemblance to those of the Anemone kind, which make a good appearance in the common borders.

The species of most note are,

1. ANEMONE-PULSATILLA.

Pulsatilla or *Pasque-Flower*.] Anemone-Pulsatilla with divided and sub-divided pinnated leaves, having a leafy involucre nodding flower, and erect petals.

Varieties of this are,] Common Pulsatilla with single blue flowers—with double blue flowers—with single and double white flowers—with single and double red flowers—with violet-coloured flowers—and with flowers having fringed petals.

2. ANEMONE-PULSATILLA *patens*.

Spreading-flowered Siberian Pulsatilla.] Anemone-Pulsatilla with digitate, many-pointed, downy leaves, and upright pale yellow flowers with spreading petals, and deep yellow stamina, and with the involucre at a distance from the flower.

3. ANEMONE-PULSATILLA *vernalis*.

Early Smallage-leaved Alpine Pulsatilla.] Anemone Pulsatilla with simply pinnated leaves, and erect bright yellow flowers.

The plants are perennial in root, but annual in leaf and stalk, which come up in spring, and perish in June or July, when they have flowered and perfected seeds.

The roots are long, thick, fleshy, and of downright growth.

The leaves rise immediately from the root, on foot-stalks, and are decomposed into many very narrow segments.

The flower-stalk rises annually between the leaves, eight, ten, or twelve inches in height, often several from the same root; near the top of each is the leafy many-pointed involucre, serving as a kind of flower-cup, and at top stands one large bell-shaped flower, in magnitude equal to a large single Anemone, is composed of six petals, in two series, with a cluster of stamina in the middle; but in the double flowers the petals are numerous.

They flower in March and April, and the seeds ripen early in autumn.

The Common Pulsatilla grows wild on hills, heaths, and dry pastures in Britain, and other parts of Europe, and the others are natives of the Siberian and Alpine mountains,

but they have been long inhabitants of many curious gardens.

The plants are good furniture for the common borders, particularly the first species and respective varieties, and they prosper any where.

The propagation of all the three species is effected by seed, and by dividing the roots. The seed ripens in July, and may be sown soon after, or early in spring, in a bed of light earth.

The propagation by roots is this: take up some of the large roots in July, when their leaves decay, or even any time till October; and such of them that are grown into heads, may be divided into as many off-set parts as have a bud or head at top, which plant, and they will each flower the following spring.

The proper time of year to remove those roots, is any time from the decay of the leaf until Michaelmas.

The roots do not bear to be kept long out of ground.

Third and last Division of Anemone.

ANEMONE-HEPATICA, the Hepatica, or Noble Liverwort.

The Hepatica, in point of general habit, having been always considered as very different from the Anemone, we, for the greater facility of distinction, treat of it in a separate division, observing however that the whole flower, though considerably smaller, possesses all the characters of the Anemone; although it was long considered as a distinct genus, principally from the trifoliate appendage situated near the flower, being mistaken for a calyx or cup; but Linnaeus considers that only as a three-leaved involucre, common to all the Anemone kind, for there is no calyx. See the *Characters*.

There is but one species of Hepatica, of which are many varieties, all very low, herbaceous, flowery perennials, that adorn our gardens in early spring, each with a large tuft of numerous flowers.

The species is,

ANEMONE-HEPATICA (*Hepatica*).

The Hepatica.] Anemone-Hepatica with leaves composed of three roundish undivided lobes, and the involucre situated near the flower.

Varieties of this are,] Hepatica with single and double blue flowers—with single and double red flowers—with single and double red and white flowers—with violet-coloured flowers—with single and double white flowers—and Hepatica with striped leaves.

These plants form themselves into low roundish bunches; the whole, including leaves, flower-stalks, and flowers, never exceed five or six

six inches in height, which are annual, but the root is of many years' duration.

The root is thick, formed into heads, and hath numerous matted fibres.

The flowers appear before the new leaves, but those rise immediately after, the whole rising directly from the root; the flower-stalks are slender, four or five inches high, and rise in great numbers, each supporting one small flower, which, in its single state, hath six petals; but these are numerous in the double flowers, and in all the varieties; they standing in close tufty clusters make a beautiful appearance in February, March, and April, succeeded in the single kinds by plenty of seed in summer.

All the varieties are choice furniture to adorn the fronts of borders, and other compartments contiguous to the habitation; or some may be planted in pots, to move occasionally to any place required, when in flower.

The double kinds have the greatest merit, the flowers being larger, and continue longer in bloom, and should occupy the most conspicuous places; but as these can only be increased by dividing the roots, which being remarkably slow of growth, are not so easily acquired as the single kinds, which may be raised plentifully from seed.

The propagation of the single kinds is effected both by seed and parting the roots, but the double sorts only by the latter method.

Observe however, that from seed of single flowers double ones are often obtained.

The seed may be sown in August, September, or March, in a bed or border of light earth, covering it hardly a quarter of an inch deep, and the plants will appear in April and May; give occasional water and weeding, and in August or September prick them upon a border open to the morning sun, where they will flower in spring, and in a year after transplant them where they are to remain.

Those plants being very slow in growth, it will be three years before they form large bunches, so as to produce tolerable clusters of flowers.

The propagation by parting the root is performed in spring; divide each root into two, three, or more parts, but not too small, because of their reluctant growth; for the merit of the plants is to have them form large bunches, capable of producing fifty or sixty flowers on the same root, which, standing in a compact cluster, or tuft, make a beautiful appearance.

The seldomer these plants are removed, the stronger and more numerous will be their flowers.

ANETHUM, Dill, Fennel, and Finocchio.

The plants are herbaceous annuals and perennials, consisting of three species, all well-known umbelliferous herbs of the kitchen garden.

Class and order, *Pentandria Digynia*.

Characters.] CALYX, the flowers are umbellated, and the umbels are compound, have neither calyx nor involucre. COROLLA, the general umbel is uniform, and the florets of the umbel have each five petals. STAMINA, five filaments, and roundish antheræ. PISTILLUM, a germen under each floret, two styles, and obtuse stigmas. PERICARPIMUM none, and the seeds are two, succeeding each germen.

The species are,

1. ANETHUM *graveolens* (annual).

Common Dill, or Rank Anethum.] Anethum with finely divided leaves, and compressed seeds, having borders.

2. ANETHUM *Fœniculum* (perennial).

Common Fennel.] Anethum with decomposed leaves, the lobes finely divided, ending in many points, and ovate seed.

Varieties of this.] Common light-green-leaved Fennel.—Dark-green-leaved Fennel.—Sweet Fennel, with long slender sparsed leaves, and white sweet seed.

3. ANETHUM *azoricum* (annual).

Azorian Dwarf Fennel, or Finocchio.] Anethum with a dwarf stalk, swelling, and fleshy near the root, and recurved seed.

These plants are all of an aromatic quality in smell and taste; are of hardy growth to cultivate on the open ground; the Dill and Finocchio are wholly annual; the Fennel perennial in root but annual in leaves and stalks; have all long spindle-shaped roots growing perpendicularly or downright; the leaves are decomposed, with the lobes finely divided into numerous, minute, thread-like segments; and the flower or seed-stems rise from one to five feet high in the different species, terminated by the umbels of flowers, succeeded by plenty of seed in August and September.

The Dill rises with a few slender leaves, and a slender erect stem, two or three feet high, the heads or umbels of which, when the seeds are formed, are the parts used in the kitchen for cucumber pickle, &c. and the ripe seeds for medicine.

The *Anethum Fœniculum*, and varieties, have long, thick, fleshy, downright roots, which, in spring and summer, send up a great tuft of large leaves, and strong erect stems, four or five feet high, dividing into many branches. The leaves are the parts used in the kitchen for mackerel, pickled-salmon, garnish to dishes, &c. therefore, the stems of a few plants should be cut down as they advance in summer, to procure a supply.

a supply of young leaves from the bottom ; but for medical purposes, the root, leaves, and seed are used.

The *Fimocchia* is a salad herb. The plant hath a short robust stalk, the bottom of which swells like a large flat turnep, and this being rendered white and tender by blanching, is the part used, which is eaten raw, being sliced and relished with vinegar, oil, pepper, &c.

Propagation, Culture, &c.

They are all propagated by seeds, which, of the Dill and Fimocchio, must be sown annually, because the plants endure but one year, or principally but one summer.

The Dill and Fennel may be sown either in autumn or spring ; the autumn sowing generally rise strongest in the spring following ; and should be sown where they are to remain, especially the Dill ; they require no particular soil or exposure ; observing that for the service of a single family a small portion of each will be sufficient, especially of the Fennel, as it continues several years ; but for public supply larger quantities must be raised in proportion.

Both these species, Dill and Fennel, are remarkable for rising abundantly from self-sown seeds, often sufficient for the service of a family.

However, here follow the directions for raising proper supplies according as required ; observing the season for sowing them as above.

Each sort to be sowed separate.

The Dill sow either in shallow drills, six, eight, or ten inches asunder, or by broad-cast on the general surface, and raked in evenly ; the plants to remain where sown ; and, in May or June, when advanced a few inches in growth, thin them by hand or hoe, six or eight inches apart, to give room to branch, and attain good strength to produce large seed-umbels ; clearing them at the same time from weeds ; and in July or August when the seeds are formed, the umbels thereof are then proper to gather to use in cucumber or other vegetable pickle ; but for medicine, must stand till the seeds are fully ripe.

The Fennel may either be sowed in drills a foot or fifteen inches asunder finally to remain, or sown broad-cast ; and the plants thinned, as advised for the Dill ; or some may occasionally be transplanted in summer or autumn, &c. in beds or borders, a foot distance, and watered at planting ; they will all furnish plenty of leaves for domestic occasions the first year, and in the second they will shoot more abundant and larger ; and produce strong branching stems and plenty of seed umbels ; and the same plants will continue by the roots several years, furnishing leaves and seeds an-

nually ; observing to cut down the stalk every autumn.

The Fennel may also be increased by slipping the large roots, which frequently divide themselves into heads ; but these do not succeed so well as the seedling plants.

The Fimocchio is sown in the middle of March, or beginning of April ; and to continue a succession till winter, repeat the sowings every month until the middle or end of July ; for the early sown plants soon run for seed the same year ; so may sow a larger crop in July aforesaid, which will stand for autumn and winter : choose an open spot of rich light ground, and by line and hoe draw shallow drills, two feet distance ; scatter the seeds thinly along the bottom, and cover them near half an inch deep with finely broken mould, and when the plants are an inch or two high, small hoe them to kill weeds, and thin them to three inches, and in two or three weeks after cut them out to treble that distance, that the base of the stem may have room to swell.

When the stalks are considerably swelled at bottom, earth them up on each side, and in two or three weeks that part will be very white and tender.

ANGELICA.

This genus furnishes four herbaceous perennials, of large and vigorous growth, the stems attaining four or five feet stature, branching strongly, garnished with large pinnated leaves, and surmounted by numerous small greenish, whitish, and purplish flowers, collected into considerable umbels.

Class and order, *Pentandria Digynia*.

Characters.] CALYX, the flower is umbellate, and the umbel is compound ; the general umbel has a five, and the partial umbel an eight-leaved involucre, and the calyx of the florets is small and five-parted. COROLLA, the umbel is uniform, and each floret has five petals. STAMINA, five filaments, and simple antheræ. PISTILLUM, a germen under each floret, two reflexed styles, and obtuse stigmas. PERICARPIMUM none, the seeds are two, succeeding each germen.

The species are,

1. ANGELICA *Archangelica*.

Cultivated, or Garden Angelica.] Angelica with leaves composed of lobes, unequal in size and number, the extreme lobe three-parted.

2. ANGELICA *sylvestris*.

Wild English Angelica.] Angelica with leaves composed of equal spear-shaped serrated lobes.

3. ANGELICA *lucida*.

Shining Canada Angelica.] Angelica with shining

shining leaves, composed of equal oval lobes, the edges cut and serrated.

4. *ANGELICA atropurpurea*.

Dark-purple Canada Angelica.] Angelica with blackish-green pinnated leaves, having the extreme pair of lobes joined.

All these plants are perennial in root, but the leaves and stalks are renewed annually in spring.

The roots are branching and fibrous.

They send up robust and strongly branching stems, four or five feet high, adorned with large pinnated leaves, composed of several large lobes, and the ends of all the stalks and branches are terminated by large compound umbels of flowers, succeeded, in all the species, by abundance of seed in August and September.

The Garden Angelica is in great request for its efficacious properties in medicine; and of its young tender stalks in May and June, cut into many pieces, is made an admirable sweetmeat. As a garden plant it may be cultivated in a kitchen garden more or less, as may be required for the above occasions; and is sometimes admitted in large pleasure grounds, to increase the variety, where it cuts a tolerable figure, with its large branching head, considerable foliage, and vast umbels of flowers.

The *Angelica sylvestris* grows wild by river sides and moist places, and having little merit, is rarely admitted in gardens, unless merely for observation.

The two Canada species possess little virtue or beauty; but being foreigners, and for the sake of variety, are allowed places in many of our gardens, in large grounds, where many plants of easy culture are required.

All these plants delight in moisture, but they rarely disdain any soil or situation.

Propagation.

All the sorts may be raised with facility from seed, in a bed or border of common earth.

The time of year to sow them is either in autumn, i. e. September or October, or early in spring, observing the autumn sowing generally rise stronger in spring following, those sown in spring sometimes rise more straggling, but may be sown successfully enough in both seasons.

The method of sowing this seed is by broadcast on the surface, and rake it in.

When the plants are four or five inches high, transplant them into a bed or border of moist earth, fifteen or eighteen inches distance, and give occasional waterings; and if any are required in the pleasure ground for variety, transplant them from the above bed in spring following, or may be planted from the seed-bed at once, where they are to remain.

These plants produce only leaves the first year; the second they shoot up stalks, flower, and perfect seeds.

Observe, that when the first stems of those plants are permitted to perfect seeds, the roots frequently perish in winter, in which case a supply must be raised annually; but if the stems are cut down in June, it increases the root, and it will survive several years.

ANNONA, *Guanabus*, or Custard-Apple, and Papaw-Tree.

The plants are of the tree and shrub kind; there are seven or eight species, one of which is a hardy deciduous shrub, the others mostly ever-green, and of the stove temperament; all the sorts are adorned with simple leaves, and bear large roundish and oblong fruit.

Class and order, *Polyandria Polygynia*.

Characters.] CALYX, five heart-shaped leaves. COROLLA, six petals, the three outermost the largest. STAMINA, the filaments hardly visible, but numerous antheræ. PISTILLUM, a roundish germen placed under the flower, invisible styles, having many obtuse stigmas. PERICARPIUM, a large, roundish-oval fruit, of one cell, containing many oval hard seeds.

The species of most note are,

1. *ANNONA reticulata*.

Netted-fruited Annona, or Custard-Apple.] Annona with spear-shaped pointed leaves, and large, conical, orange-coloured fruit, having a netted rind.

2. *ANNONA muricata*.

Prickly-fruited Annona, or Sour-Sop.] Annona with oval, spear-shaped, plane, smooth, shining leaves, and large oval, greenish yellow, prickly, sour fruit.

3. *ANNONA squamosa*.

Scaly-fruited Annona, or Sweet-Sop.] Annona with oblong-pointed leaves, and small oval, obtuse, scaly, sweet fruit.

4. *ANNONA palustris*.

Marsh Annona, or Water-Apple.] Annona with oblong, obtuse, smooth, odoriferous leaves, and round smooth fruit.

5. *ANNONA tripetala*.

Three-petaled, Broad-leaved Annona.] Annona with broad ovate, acute, shining leaves; flowers, often three-petaled, and oblong, scaly purple fruit having a soft sweet pulp.

6. *ANNONA triloba*.

Three-fruited Annona, or Papaw Tree.] Annona with large spear-shaped leaves, and inverted pear-shaped fruit, growing by threes on each foot-stalk.

These trees are natives of America, the first five species are from the warmest parts; they are ever-green, and require the constant aid of a stove.

stove in this country. But the sixth sort is a hardy deciduous shrub, that prospers here in the full air.

In America, the first five species obtain twenty or thirty feet stature, garnished with beautiful large leaves, which are universally simple, and stand alternate; and flowers proceeding singly from the sides of the branches, succeeded by large fruit, full of a soft pulpy substance, in some very sweet and palatable, that of the *Annona reticulata* being of the texture of a custard, whence it, in America, derived the appellation of Custard-Apple.

These five species however never produce fruit in Europe, and rarely flower, so are retained here in stoves by the curious for variety, and the beauty of their ever-green leaves.

The *Annona triloba* or Hardy Papaw, is of North America; it rises twelve or fifteen feet high, the leaves very large and alternate, and the flowers are of a chocolate colour, which sometimes appear here in May, but never any fruit.

Propagation, Culture, &c.

All the sorts are propagated by seed.

The seeds are imported from America by many of the London seedsmen. &c. they are to be sown as soon as they arrive; those of the tender kinds sow in pots of light rich earth, and plunged in a bark-bed under glasses; and when the plants are three inches high, prick them in separate pots, give water, and plunge them in the bark-bed, and afterwards may be stationed in any part of the stove, where they must be always retained.

The seeds of the hardy *Annona* may either be sown in a bed of common light earth, or in pots or boxes, or may be forwarded in a moderate hot-bed just to raise the plants, then inured to the full air; and those in pots, at the approach of winter, may be moved into the green-house, or shelter of a frame, for the plants are impatient of severe frost whilst young, so the seedlings should be planted in pots to have occasional shelter the first two or three winters, then turned out into the full ground.

ANNUAL PLANTS.

Such as are only of one year's duration, or many only but a few months, or at most one summer's continuance, all however are denominated *Annual Plants*; rising from seed generally sown in the spring, arrive to full growth the ensuing summer and autumn, produce flowers and ripe seed; then totally perish top and root in most sorts in autumn and winter following; though some hardy sorts late sown will stand over the winter till next spring, especially several of our esculent annual plants of the kitchen garden, but very few of the

flowering annuals remain longer than till October or November, only in some particular sorts, that may be continued all winter by protection of a green-house, &c. or garden-frame.

Plants of the annual tribe are very numerous, principally all of the herbaceous kind, consisting of a vast number both of uncultivated plants, weeds, &c. and a very considerable tribe of cultivated plants of our gardens and fields, comprising both esculent vegetables, and of the flowery race as ornamental plants; and which latter are commonly called simply *Annuals*, are a very extensive tribe, and of which there are both hardy and tender kinds, and many of them producing very pretty flowers, and others of some singular peculiarity, are greatly cultivated as principal ornaments to the flower-garden and pleasure-ground in summer and autumn.

As the *Annual Plants* of our gardens consist both of esculents and flowers, as before observed, belonging to many different genera where their description and culture is fully explained under their respective heads, and being thus necessarily dispersed and arranged in their proper families, it is thought eligible to collect the names of the different species and their respective varieties in one general list, whereby to display the different sorts under one point of view, with some necessary intimation of their general uses and culture collectively; referring to their several genera for particulars.

Under this head, however, of *Annual Plants*, I shall consider those of the ornamental flowering kind, commonly called *Annuals* as before observed, or annual flowers, which being collected in one point of view will much assist the memory, by shewing at once the proper sorts, eligible for furnishing the flower-garden, &c. giving also short hints of their nature, growth, propagation, and culture; and as to the esculent *Annual Plants* of the kitchen-garden, they are displayed under the article *Kitchen-Garden Plants*; to which we refer the reader.

With regard therefore to the Annual flower Plants, or *Annuals*, they consisting of hardy and tender kinds, shall arrange them accordingly under distinct heads, *Hardy and Tender Annuals*, the hardy *Annuals* being such as will grow from seeds sown in the natural ground on beds, borders, &c.; and the tender *Annuals* are such as require to be sown, raised, and forwarded more or less in hot-beds, as will be explained under the above-mentioned respective heads.

The hardy *Annuals* are generally sown in the places where it is required they shall flower,

flower, to remain principally in the same place without transplanting, as many of the sorts will not succeed so well by removal; though some others will succeed both ways, and may be transplanted occasionally, but for the greater part to remain where sown.

And the tender Annuals being sown and raised in hot-beds to a certain state of growth, as hereafter explained, are then to be transplanted, some into pots, others into the full ground in beds, borders, &c. in May or June.

Shall now proceed to give a list of the different species and varieties of Annual flowers under this general head, in one point of view, by their English or common names, adding also the botanic, or generical name of the genus to which each species belong; comprising the whole under three classes or tribes according to their temperament of growth, viz.—Hardy, less-hardy or Tender, and Tenderest Annuals; all of which to be raised from seed annually, as being but of one summer's duration, as before intimated, or some but of two or three months' continuance, being always raised from seed in the spring, flower in summer and autumn, ripen seed, and then wholly perish top and root at the approach of winter.

1. *Hardy Annuals.*

Under this head is comprised a numerous tribe of Annual flowers of hardy growth to sow in the natural ground, in March, April, and May, in beds, borders, and pots, generally the greater part in small patches, each sort separate, or some in drills; mostly all to remain where sown, or some to transplant occasionally, as mentioned hereafter in the directions for their general culture.

Adonis, *Flos-adonis*, or Adonis flower (*Adonis*.)

Alkekengi (*Physalis*)—white-flowered—blue—yellow-berried—red-berried.

Amaranthus (*Amaranthus*)—Prince's-feather—love-lies-bleeding—purple.

Alyssum—White Sweet-scented.

Amethystea (*Amethystea*)—blue.

Balm, Moldavian (*Dracoccephalum*).

Belvedere or Summer cypress (*Chenopodium*).

Calendula or Cape Marigold (*Calendula*).

Candy-tuft (*Iberis*)—white-flowered—purple—large white—crimson.

Catchfly, Lobels (*Silene*)—red-flowered—white—purple.

Caterpillar (*Scorpiurus*).

Clary (*Salvia*)—red-topped—white-topped.

Convolvulus (*Convolvulus*)—three-coloured convolvulus minor—minor blue and white—minor blue—major great blue—great white—great striped blue—great purple—red.

Cyanus or Bluebottle (*Centaurea*)—blue-

flowered—purple—white—red—striped blue, and white.

Cucumber, Spirting (*Momordica*).

Devil-in-a-bush (*Nigella*)—blue-flowered—white—nettle-leaved.

Fumitory (*Fumaria*)—yellow.

Gourd (*Cucurbita*) but not sown before May in the natural ground.—See next class of Annuals.

Hawkweed (*Hieracium*)—yellow—red.

Hedge-hog trefoil (*Medicago*)—Snail-shaped, prickly—turbinated—globular—orbicular—long—crooked—twisted.—See the genus *Medicago*.

Honey-wort (*Cerinth*)—great—less.

Hollyhock (*Alcea*)—Chinese variegated—double-flowered.

Jacobæa, or Ragwort (*Senecio*)—purple-flowered—white.

Indian corn (*Zea*)—tall-growing—dwarf.

Kidney beans, runner (*Phaseolus*)—scarlet runner—dwarf scarlet—large white runner.

Ketmia, Bladder (*Hibiscus*).

Larkspur (*Delphinium*)—upright blue—upright purple—upright white—upright rose-coloured—white rocket larkspur—rose rocket larkspur—dwarf rose rocket larkspur—dwarf white rocket larkspur—dwarf blue rocket larkspur—dwarf red rocket larkspur—branching larkspur—blue branching larkspur—white branching larkspur—double and single-flowered of all the sorts.

Lavatera (*Lavatera*)—cretan red-flowered—white—purple

Lupine (*Lupinus*)—dwarf yellow—large yellow—white—great hairy blue—great hairy rose-coloured—narrow-leaved blue.

Lychnis, Dwarf (*Silene*.)

Marigold (*Calendula*)—double orange-coloured—double yellow—double lemon-coloured—gold-coloured—party-coloured—yellow ranunculus-flowered, childing or proliferous—Cape marigold.

Mallow (*Malva*)—curled-leaved—oriental.

Mignonette (*Reseda*)—odoriferous, or sweet-scented.

Nasturtium (*Tropaeolum*)—Major or large-growing—minor or dwarf.

Nolana (*Nolana*)—Peruvian dwarf blue.

Nigella.—See devil-in-a-bush.

Pansy or heart's-ease (*Viola*)—common small variegated—large Dutch variegated—large purple—yellow—purple and yellow—purple yellow and white.

Peas, Sweet-scented, &c. (*Lathyrus*)—purple—white—painted-lady—Scarlet—Tangier pea.

Pea, winged (*Lotus*).

Pea, crown (*Pisum*)—white-blossom crown pea—painted-lady crown pea—rose-coloured.

Perficaria, oriental (*Polygonum*)—red-flowered—white-flowered.

Poppy (*Papaver*)—large double purple—double red—white—variegated—red and white spotted, or carnation poppy—dwarf red—dwarf purple—dwarf variegated—double and single of all the sorts. See the Genus *Papaver*.

Queen's balm (*Dracocephalum*).

Scabious (*Scabius*)—purple sweet scabious—red-flowered—white—striped—hen and chicken-flowered—starry-flowered. See the genus *Scabius*.

Snail trefoil (*Medicago*). See Hedge-hog trefoil.

Stock gilliflower, ten weeks (*Cheiranthus*)—purple flowered—red—white—scarlet—dwarf French—wall-flower-leaved red—wall-flower-leaved purple—wall-flower-leaved white.

Stock Virgin (*Cheiranthus*)—purple—white.

Snap-dragon (*Antirrhinum*)—annual with white flowers—purple flowers—major or great snap-dragon—with red flowers—purple—white—yellow—scarlet—red and white—purple and white—red and yellow—white and red—yellow and red—yellow and white—scarlet gold-dotted. See the genus *Antirrhinum*.

Strawberry Spinach (*Blitum*).

Sunflower, Annual (*Helianthus*)—tall growing—dwarf—double flowered of each.

Sweet-Sultan (*Centaurea*)—purple—red—white—yellow.

Toad-flax (*Antirrhinum*)—three-leaved yellow—three-leaved purple—three-leaved blue—variegated—white—branching yellow. See the genus *Antirrhinum*.

Tobacco (*Nicotiana*)—hardy round-leaved—Virginia long-leaved—Virginia broad-leaved.

Virgin or Virginia Stock (*Cheiranthus*). See Stock above.

Venus' looking-glass (*Campanula*)—purple-flowered—white.

Venus' navel-wort (*Cynoglossum*)—blue-flowered.

Xeranthemum or eternal-flower (*Xeranthemum*)—red—white—purple—double-flowered.

The above tribe of hardy Annuals comprise many very ornamental flowers for adorning the general flower-borders, &c. are all of hardy growth to be raised in the natural ground, in any common soil and situation in beds, borders, and pots in the flower-garden and pleasure-ground: all to be raised every year from seed in the spring; and mostly sown in the places where you design they shall flower, the plants remaining where sown; which should generally be in small patches disposed at some orderly distances, in the different

flower-borders and other compartments in assemblage with other flowering plants; or some sorts may be disposed in separate beds in patches, or in drills, &c.

The general season for sowing all the sorts is principally in the spring, from about the middle or latter end of February to the middle or end of April for the principal blow; also some occasionally in May and the beginning of June for successional and late-flowering, especially of some quick-flowering kinds of short duration, such as candy-tuft and virgin stock, &c.

The order of sowing all these hardy annuals being principally in little patches to remain as above hinted, the patches should be formed about three or four, to five, six, or eight inches diameter, at moderate distances in some regularity, towards the front, middle, and back part of the borders or beds, &c. in a varied manner; the smaller-growing sorts sown more or less towards the front of the borders, according to their degrees of growth, and the larger kinds more backward therein in the same proportion; and some may be occasionally sown in pots: and in all of which each sort and respective varieties to be sown in separate patches, &c. from about a quarter of an inch to half an inch or inch deep, or but little more, according to the sizes of the different sorts of seeds; observing, in this business, generally to loosen and break the earth a little for each patch, especially if hard or stubborn, then drawing off a little depth of mould, less or more, as above, to one side, sow the seeds, several or many together in a patch, proportionally to the size and nature of growth of the respective plants, covering the seeds regularly with the earth the depth above intimated: and thus proceed in general, placing a small short stick or other mark to each patch as you proceed in sowing, to distinguish the places.

Or some may be occasionally sown in drills, either in beds separately, or in the borders; low growing kinds towards the front; the larger sorts towards the back part; in which order of sowing may have virgin-stock, candy-tuft, larkspur, sweet-peas of the different sorts, lupines, ten-weeks' stocks, &c.

After sowing, if it be dry warm weather, it would be beneficial to give occasional light waterings, both before and after the plants are come up, especially in their minor growth.

And when the plants are come up about an inch or two high, those in the patches will, in many sorts, require thinning, especially those of larger, tall growth, and bushy kinds, such as sun-flowers, perficaria, Indian-corn, tobacco,

co, belvedere, marigold, &c. thinned to one good plant in each patch, others to two or three strong plants, as lavatera, curled and oriental mallow, strawberry, spinach, chinese-hollyhock, Xeranthemum, Amaranthus, Scabious, Sweet-sultan, and the like kinds; and some left in small bunches, as candy-tuft, lupines, larkspurs, sweet-peas, cyanus, nasturtium, convolvulus, Venus' looking-glass, and navelwort, mignonette, virgin-stock, moldavian balm, and many others of similar growth; or likewise some ten-weeks' stocks and mignonette may either remain thin in patches, or where too thick, some of each transplanted in that order, three, four, or five, together, or as required; also in many of the other sorts, some may be occasionally thinned out for transplanting where required to supply any deficiencies, &c. performing it in showery weather.

In the advancing growth of the plants, the principal culture is to keep them clean from weeds; and where any large sorts remain too close or crowding, thin them according to their growth in some regular order, and in the larger tall-growing kinds some will require support of stakes; also most of the climbing and trailing sorts, particularly the sweet-peas, convolvulus-major, and large nasturtium, &c. and to which (climbers), place some upright small branchy sticks, trimmed up a little regular, or the convolvulus and scarlet bean, being volubilate or twining climbers, will ascend spirally upon any straight upright stick, pole, or stake.

If required to have any desirable sorts of these hardy Annuals, of moderate growth, to flower early, they may be forwarded by sowing the seed in pots in February or March, and placed in a hot-bed, or more successfully in a hot-house, &c. such as scarlet and other sweet-peas, virgin-stock, candy-tuft, mignonette, ten-weeks' stock, dwarf lupines, dwarf larkspur, queen's balm, or several others occasionally, of similar moderate growth.

As all the plants of this tribe of Annuals generally produce plenty of ripe seed in autumn, and soon after wholly perish top and root, should be careful to save proper supplies of seed of the different best sorts, according as it ripens in perfection, whereby to have plenty for sowing the ensuing spring to raise a production of new plants for flowering the following summer.

In some sorts the scattered or self-sown seed, disseminated from the plants on the borders, will often come up naturally early in the spring, such as larkspur, prince's-feather, perficaria, &c. and which, if permitted to stand, will flower sooner than the spring-sown plants;

but as some of these often rise irregularly, they might be transplanted while young in some regular order: however, as these are only chance productions, should independently perform the regular sowings.

For the general description of the nature of growth, and particular culture of the foregoing different species and varieties, see each sort under its proper or respective genus.

2. *Less hardy or Tenderer Annuals.*

Under this head is comprised a tribe of Annual flowers of a tenderish nature, which, in the greater part, require to be raised in a hot-bed in the spring, and from which to be transplanted in May or beginning of June, into beds, borders, pots, &c. to remain for flowering; they mostly requiring to be thus assisted by sowing in a hot-bed in March or beginning of April, both on account of the tenderish nature of most of the sorts, and to forward them more expeditiously to a proper growth for transplanting at the time above mentioned, that they may sooner acquire a requisite degree of strength to flower in good perfection at a timely season in summer; though it is also proper to observe, that most, or at least many of the sorts will also succeed by sowing in a warm border or bed of natural earth, under protection of a garden-frame or hand-glasses, in April; but they will not come so forward for transplanting, or probably not attain a proper growth to flower so soon, by a fortnight, or three or four weeks: however, in default of hot-beds, they in the greater part may be sown in a bed or border of natural earth in April, defended with glasses, &c. or also, in want of glasses, many of the sorts may be sown in the middle of April in a warm border, and sheltered occasionally with garden mats in cold nights; or even sometimes, in a temperate mild spring, will succeed without any shelter, when sown about the middle or towards the latter end of April in a warm situation.

But as several of the sorts in this list will not succeed well without a hot-bed, have distinguished them by this mark *; and if convenience suited to sow the whole of this tribe in some moderate hot-bed, it would bring them considerably forwarder; so that, agreeable to these intimations, every one may proceed according to his conveniences, as above, in raising the desired sorts.

And it may be observed that in this list some are introduced which are also arranged among the Hardy Annuals, intimating thereby, that by sowing and raising these particular sorts in a hot-bed, or under shelter of frames and glasses, &c. they may be raised and forwarded to much earlier flowering in good perfection.

In the whole, this class comprises many different species and varieties of very ornamental flowering Annuals of the sorts following.

African marigold (*Tagetes*)—orange-coloured—lemon-coloured—deep-yellow—fistulous, or quilled—waved-flowered—dwarf—sweet-scented—double-flowered of each.

Amaranthus (*Amaranthus*)—* greater or tree-amaranthus—* bloody—trailing, or loves-bleeding.

* Balsam (*Impatiens*)—red—scarlet—purple—striped—variegated—double.

* Basil (*Ocimum*)—common greater upright sweet—with broad leaves—fringed-leaved—purple-leaved—tricolor-leaved—red-flowered—purple-flowered—long-spiked, &c.—leaf, or bush-basil—with hoary leaves—dark-purple-leaved—variable-leaved, &c.

Calendula, or Cape Marigold (*Calendula*).

* Capsicum (*Capsicum*)—long-podded—short-podded—heart-podded—bell-podded—angular-podded—cherry-podded—olive-podded—red-podded—scarlet-podded—yellow-podded. See the genus *Capsicum*.

China aster (*Aster*)—blue-flowered—purple—red—white—striped—variegated—bonnet-flowered—quilled-flowered—double and single of each.

Chinese hollyhock (*Alcea*)—variegated—double.

Chrysanthemum (*Chrysanthemum*)—yellow—white—cream-coloured—sulphur-coloured—fistular or quilled—double and single of each.

Convolvulus (*Convolvulus*)—major, with deep-purple flowers—red—blue—white—deep-blue.

* Cucumber snake-shaped (*Cucumis*).

* Egg-plant or Melongena (*Solanum*)—white-fruited—purple-fruited.

French marigold (*Tagetes*)—deep-yellow—golden-yellow—crimson-coloured velvety—crimson and yellow striped—variegated crimson and yellow—sweet-scented dwarf—double and single of each. See *Tagetes*.

Gourd (*Cucurbita*)—orange gourd—pear-shaped—striped pear-shaped—lemon gourd—top-shaped—bottle gourd, or calabash—buckler-shaped, or squash—carbuncled gourd—warted gourd—long taper—long crooked—horn-shaped—large barrel-shaped—large globular—large oval—hemispherical—yellow—stone-coloured—flesh-coloured—sandy-coloured—party-coloured—white—with numerous other varieties—all of which may be sown in a hot-bed in April for transplanting, or in the natural ground in May. See the genus *Cucurbita*.

* Globe Amaranthus (*Gomphrena*)—purple-headed—white—variegated—silvery—spiked.

Indian corn (*Zea*)—tall-growing—dwarf.

India pink (*Dianthus*)—bright-red—purple—white—red and white variegated—differently variegated, numerous—large imperial—double and single of each. See *Dianthus*.

* Love-Apple (*Solanum*)—red-fruited—yellow-fruited—cherry-shaped.

* Marvel of Peru (*Mirabilis*)—red-flowered—yellow—white—purple—striped—long-tubed-flowered.

* Melon, snake-shaped, or serpent cucumber—(*cucumis*).

Mignonette (*Reseda*)—sweet-scented.

Nolana (*Nolana*)—trailing, blue.

* Palma-Christi (*Ricinus*)—major, or tall-growing—minor, or less—most-broad-leaved—lesser-leaved—with other different varieties. See *Ricinus*.

Perficaria, oriental (*Polygonum*)—red-flowered—white.

Sultan flower (*Centaurea*)—yellow.

Stock gilliflower, ten weeks' (*Cheiranthus*)—red—purple—white—scarlet—dwarf scarlet—dwarf white—wall-flower-leaved white—wall-flower-leaved purple—double of each.

Tobacco (*Nicotiana*)—Virginia long-leaved—Virginia broad-leaved.

* Tree amaranthus (*Amaranthus*).

* Zinnia (*Zinnia*)—red-flowered—yellow.

The above tribe of tenderer Annuals being, in the greater part, of a less hardy or tenderer nature than those of the first class, and not generally so tender as some of those in the third division, will not, in general, admit of sowing early in the spring, in the open ground; and should be mostly either sown in a moderate hot-bed in March or April, and the young plants forwarded a little in growth therein, till settled warm weather in the middle or latter end of May, then transplanted; or sown in a bed of natural earth, or warm border, in April, protected under a garden-frame, or glasses, or at least defended in cold nights with garden-mats; and in either method are all to be transplanted in May, or beginning of June, into beds, borders, pots, &c. in the flower and pleasure-garden, to remain for flowering in summer and autumn.

But where the convenience of a hot-bed is attainable, it is always advisable to raise a principal supply by that means for earlier transplanting and flowering; as a portion of the different sorts may be sown and raised in one hot-bed, smaller or larger, according to the quantity required; such as a bed for a one-light, or a two or three-light frame; or, where considerable supplies are wanted, a larger extent

extent of hot-bed will be necessary in proportion: making the bed or beds in March or beginning of April, and defended with a frame and lights, or hand-glasses; or, in want of these, protected with an awning of mats in cold nights, and bad weather; observing, in general, that only a moderate hot-bed, of about two feet thick in dung will be sufficient, earthing it at top, five or six inches deep, with fine light rich mould: and in which sow the seed in small drills cross-ways, drawn with the fingers, two or three inches asunder, half an inch to an inch deep, according to the size of the different sorts of seeds, which sow regularly, each sort separate, and cover them in evenly with the earth, the same depth: give air occasionally, by raising one end, &c. of the glasses an inch or two; or, if a covering of mats, take them off, or turn them up in front, in the day-time; and, according as the plants advance in growth, admit a larger portion of fresh air, to strengthen and harden them by degrees; giving also, occasionally, gentle waterings.

Thus continue the care of the young plants till advanced two or three inches in growth; then it would be of advantage to prick a quantity of the principal sorts into another moderate hot-bed, three or four to five or six inches asunder, or others into natural beds of light earth, under frames and glasses, or defended occasionally with mats; but, in deficiency of the above means of hot-beds and frames, &c. they may mostly, in general, be pricked out, in the middle or latter part of May, into natural beds in the open ground; and in all of which give water at pricking out, and afterwards occasionally; and with occasional shading with mats from the sun, where convenient, till the plants have taken fresh-root; observing to those in hot-beds and under glasses, continue giving air less or more every mild day: and when, in three, four, or five weeks, in either of these beds, they have acquired some tolerable degree of strength and size, of four, five, or six inches growth, or more, according to that of the different sorts, they should all be finally transplanted about the middle and latter end of May, and in June, into the full ground, in beds, borders, and other compartments, and in pots, all to remain for flowering; generally taking opportunity of moist weather, if possible, for this work of final transplanting; and, where convenient, to remove and replant some sorts with a little ball of earth adhering about the roots, it will be of beneficial advantage; watering them as soon as planted, and afterwards, as occasion requires, till fresh-rooted, and discover signs of a renewing growth.

Where any of the above-raised plants remained in the seed-bed, not pricked out, they probably, in standing close, will draw one another up in a weakly growth; should be careful to plant them out in May, as soon as the weather is settled a little favourably temperate, especially for the more tender species, marked *.

Note, some ten-weeks' stocks and mignonne may be sown in a hot-bed so early as February, or any time in March, to raise a few plants to prick in pots, three or four in each, for earliest flowering; or some may be sown in March, in the natural earth, or a warm border, &c. under glasses or other occasional shelter, for early transplanting, in April or May, in pots, and flower-borders, &c.

In the gourd kinds, when designed to raise any in hot-beds, they should not be sown before April; for, if sown earlier, they would grow too large before the season commenced sufficiently warm to admit of planting them out into the full ground; or, in the beginning or middle of May, some may be sown in the natural ground, both for transplanting, and some in patches, to remain.

But, as before intimated, where hot-beds, frames, glasses, and other appertaining conveniences are deficient, many of the species and varieties in this division, not marked *, may be raised in the open ground, especially if not generally sown till the beginning, or towards the middle or latter end of April, according to the temperature of the season; sowing them in a warm border, or other compartment of light earth, or some also in pots, placed in a similar situation; and when the plants are advanced several inches in growth, should be pricked out in beds, or planted out finally in May and beginning of June, as aforesaid; they will all flower in tolerable perfection, but not generally so soon by several weeks, nor all in an equal degree of full growth and perfection of flowering, as those which are forwarded in a hot-bed, or under protection of frames and glasses, &c. to a proper size for earlier transplanting.

The sorts in this class that will the most readily succeed, occasionally, without the assistance of a hot-bed, &c. are the African and French marigolds, chrysanthemum, China-aster, sultan-flower, India-pink, love-lies-bleeding, Chinese-hollyhock, persicaria, tobacco, ten-weeks' stock, and mignonette, Indian-corn, nolana; also gourds, if not sown till May; and sometimes palma christi, and love apple, in a temperate warm season; all of which sorts may be sown in a bed or border of natural earth, in a warm situation, as above observed, but not in most of the sorts before the

the middle of April, and the plants thereof pricked or-planted out in May and June, into beds, borders, and pots, to remain for flowering.

But in sowing the above sorts in the natural ground for want of hot-beds, if the bed or border wherein they are sown could be defended under frames, or hand-glasses, or sheltered at nights and bad weather with mats, it would be of much advantage in raising the plants more successfully in a forwarder growth, and they would sooner attain proper strength for transplanting and flowering.

As to the other sorts in this class, marked *, they cannot be raised in any tolerable perfection without a hot-bed to bring them forward at first to a proper growth for transplanting: or, however in want of hot-beds, may sow some under glasses, about the middle or latter end of April or beginning of May; and when the plants are advanced a few inches in growth, in the latter end of May or beginning of June, may be planted out into beds, borders, and pots.

However, we shall just finally remark, in general, that as all or most of the plants in this list, being more or less of some tender nature, and, although having intimated that many of the sorts may occasionally be raised in the natural ground, in default of other conveniences, the most general practical culture, for superior success, is to sow and forward an eligible supply of all the principal different sorts in a hot-bed, in March or April, till the middle or latter end of May; or, at least, some of the less tender sorts, in a natural bed, under a frame and glasses, all for planting out in the latter end of May, and in June; and those thus raised will always be considerably forwarder and stronger in growth, for transplanting at the proper season, as well as flower much sooner in good perfection.

In planting out the different sorts of plants in this class, in May and June, finally, where they are to remain for flowering, showery weather would be of great advantage: and, where any particular sorts can be removed and replanted, with a little ball of earth about the roots, that advantage should not be omitted. The planting may be performed in some with a garden-trowel, to make proper apertures for those with balls of earth, or full roots; and others planted with a dibble, according to their growth: generally, in most sorts, planting them singly, or one plant in a place, and disposed in assemblage in the borders, &c. in a diversified order; the smaller sorts placed more or less forward, and the larger kinds planted towards the middle and back parts, in some proportion to their different degrees of growth,

and some principal sorts planted in pots, as may be required; observing, generally, in this transplanting, that in the ten-weeks' stocks, particularly, it is advisable to plant some in patches, three or four plants together, about three inches apart, both in the borders, &c. and in pots, in order that, as being of small growth, their flowers together may both appear more conspicuous, and to have a greater chance of obtaining some double-flowered plants among those in each patch; some mignonette and nolana, being low plants, may also be planted in the same order. The love-apple, and gourds, being of very extensive rambling growth, some should also be planted against a south-wall, paling, or treillage, &c. especially the love-apple, to have their extending branches trained thereto, that they may ripen their fruit more effectually in autumn; or, likewise, some gourds of the small-fruited kind may be planted in a similar manner, or against the railing of arbours, &c. in order to be trained up thereon in their advancing growth; others planted in capacious spaces in large borders, &c. to have room to extend along the ground, or some to be trained up to strong tall stakes.

Give the whole a moderate watering directly at planting, more especially if dry weather, and repeat the watering, occasionally, till the plants have taken fresh root and begin to grow.

Their after-culture is principally to keep the plants clear from over-running weeds; and to give occasional support to some of large or tall growth; or sometimes where any branch out very irregular or ramblingly in their advanced growth, such as often occur in the African and French marigolds and chrysanthemums, &c. they should be trimmed to some regular order; and some sorts, such as love-apple and gourd kinds, if any were planted in the borders, they being of very rampant growth, some should be trained up to strong stakes, both to prevent their over-running the other adjacent plants, and that their fruit may appear more conspicuous and ripen in greater perfection, especially the love-apple.

And such plants of this class as are planted in pots, will be ready for moving in their respective pots occasionally, when in flower, to adorn any particular compartment, as may be required; and observing in these, that as the earth in the pots will dry very fast in hot weather, they will require watering every day or two during the hot dry season.

All or most of the plants in this tribe will begin flowering in June or July, and continue mostly till September or October; and which;
in

in the greater part, are very ornamental; though some sorts are of no estimation in their flowers, such as the capicum, love-apple, egg-plant and gourds, they being valued chiefly for the appearance of their fruit; and the palma-christi for its majestic growth and vastly large palmated leaves, in different variety.

That as all the sorts produce ripe seed in autumn, and soon after wholly perish, should give good attention to gather eligible supplies of the seed from the best flowering plants of the different sorts in proper time, according as it ripens; spreading it to dry, then rubbed out, and put up in bags or papers, for sowing next spring.

For the general description and particulars of culture, &c. of the different species and varieties in this class of Annuals, see each sort under its respective genus.

3. *Tenderest Annuals.*

This class comprises some curious Annual plants of the most tender nature, which indispensably require to be sown and raised in hot-beds in February, March, or beginning of April, and continued forwarding therein till the latter end of May, or beginning or middle of June, then removed into the full air, some in pots, others planted in the borders, &c. and as among which some are inserted that are also arranged in the second class; which intimates that being managed according to the direction given for the plants in this division, they may be raised in some superior degree of perfection by the same mode of culture.

Amaranthus (*Amaranthus*) — tricolor — bicolor — maximus or tree amaranthus — bloody, &c. See the genus *Amaranthus*.

Balsamine or balsam (*Impatiens*) — double striped — double scarlet — double purple — double bizarre. — See *Impatiens*.

Browallia (*Browallia*).

Cock's Comb (*Celosia*) — tall purple-headed — dwarf-purple — crimson — buff-coloured — yellow — branching.

Convolvulus, scarlet (*Ipomæa*).

Egg-plant (*Solanum*) — varieties as in the second class,

Globe-amaranthus (*Gomphrena*) — the varieties, as in the second class.

Humble-plant (*Mimosa*).

Ice-plant, or diamond ficoides (*Mesembryanthemum*) — oval-leaved — pinnatifid-leaved.

Marvel of Peru (*Mirabilis*) — the varieties, as in the second class.

Martynia (*Martynia*) — purple-flowered — red — white.

Melon, snake-shaped (*Cucumis*).

Stramonium (*Datura*) — double white — double purple — double striped.

Sensitive plant (*Mimosa*) — double-flowered annual — common shrubby — humble.

Zinnia (*Zinnia*) Varieties. See second class.

Most of the plants of this class are superiorly ornamental and curious, some in the beauty of their flowers, others in the singularity of their beautifully-coloured leaves, as in the *Amaranthus tricolor* and *bicolor*; some for the curiosity of their fruit, as in the egg-plant and snake melon, &c. and the humble and sensitive plants, most singularly curious in the sensitive motion of their leaves; the ice-plant, in its icy-like or crystalline appearance; and the tree-amaranthus, both in its large tall growth branching horizontally widely around, and its vast pendulous flower-spikes two or three feet long or more.

They must all be raised in hot-beds in the spring, under frames, &c. till May or June; and that to obtain them in some tolerable degree of perfection, two different hot-beds, at three, four, or five weeks' interval, will be necessary; sown in one the latter end of February or any time in March, or not later than the beginning of April; and the young plants, when about one, two, or three inches high, should be pricked, some in small pots singly, and some pricked in the earth of the bed, three or four inches asunder; all, either in the same bed, if room enough, otherwise in another hot-bed; and when they advance in growth considerably as to crowd one another, should be removed into a larger hot-bed under a deeper frame, or the frame raised at bottom occasionally according as the plants rise in height; planting them in this new hot-bed, some in large pots, and others potted that were not planted therein before, plunging the pots in the earth of the bed; or some pricked in the bed six or eight inches asunder; giving water in general, and put on the glasses; and observing that the whole from their first growth must be allowed admission of fresh air every day, by raising the upper end of the glasses one, two, or three inches; and to supply them also with occasional moderate waterings; likewise observing that according as the plants rise near the glasses to raise the frame a little in proportion.

In this manner to continue forwarding the plants in the hot-beds, under frames and glasses, until the latter end of May, or some time in June, according to their increased growth or temperature of the season, as before suggested; but in the mean time, in their advanced state, inure or harden them by degrees to the weather, by admitting a large share of air, or sometimes taking the glasses off entirely in warm days, &c. and then all, but the humble and sensitive plants, removed into the full air, some

some in their pots, and others planted in the borders, &c. and will all flower in June or July, August and September, produce seed and fruit, and then soon after wholly terminate their existence root and branch.

The humble and sensitive plants, should generally be continued constantly under glasses, in a green-house, &c. or in a room window within, in the full sun; for if fully exposed to the open air, it would deprive them of much of their lively sensitive motion, in which curious singularity their principal merit consists. See *Mimosa*.

But when required to raise some of the more curious sorts in this class of Annuals in the greatest perfection, in size of growth and flowers, &c. such as the tall cock's comb, tricolors, bicolors, double balsams, stramoniums, globe amaranthus, egg-plant, &c. it will be proper to give some fuller explanations of the particular method of culture for raising them to that superior state.

To effect this, two or three different successional hot-beds under frames and glasses, made at so many different times, at about a month's interval will be necessary: that is, a smaller one in March, wherein to sow the seed and raise the plants an inch or two high; a second in April, of larger dimensions, in which to prick the young plants from the seed-bed, three or four to five or six inches asunder; and sometimes a third hot-bed the beginning or middle of May, for a larger frame to receive them transplanted into pots, and in which to remain till June, to grow to full size; previously observing, that in their advancing growth in the second and last hot-bed, the frames must be occasionally raised or augmented in depth, according as the plants shall rise in height.

Make the first hot-bed for the seed in March, in dimensions for a one or two-light frame, and about two feet and an half deep in dung; directly set on the frame and glasses, raising one end of the glass to pass off the rank steam of the dung; and in a few days, or when the first great steam and heat of the bed is a little abated, lay on the earth, which must be light, rich and dry, and laid about four to five or six inches thick; then proceed to sow the seeds of the different sorts, each kind separate, in small shallow drills drawn with the finger; sow the seed therein moderately thin, covering it in with fine mould a quarter to half an inch deep, or the very small seeds but just lightly covered with the earth; this done, directly put on the glasses again, tilting one end a little for the evaporation of the rising steam of the bed; but cover the glasses every night with a gar-

den mat. The plants will appear in a few days, when fresh air must be judiciously admitted, by propping up one end of the glass about an inch or two every mild day; and when the earth appears dry, give a very light sprinkling of water in a sunny forenoon; keep the glasses mostly close of nights, or if a strong steam and heat, may be raised a little at one corner for air to enter and the steam to pass away, hanging the end of a mat before the tilted part, and continue to cover the glasses with mats every night.

In this manner continue the care of the feeding plants in the present bed for about three weeks, or till advanced one, two, or three inches in growth, according to that of the different sorts, and then should be pricked into another new-made hot bed.

About the beginning or middle of April, or a little before or after, when the plants in the seed hot-bed are advanced about one, two, or three inches, as just above intimated, another hot-bed should be made in readiness in proper time to receive them at that state of growth; making this bed for a two or three-light frame, or in length according to the quantity of plants, and about two feet and an half deep in dung; set on the frame and glasses, and when the strong heat of the bed subsides, earth it within the frame with light dry mould, five or six inches thick; shut down the glasses, and next morning or same day, when the bed has imparted a proper warmth to the earth, take up the plants with care from the seed-bed, and prick them in this four or five inches distance; give a very light watering, and directly put on the glasses, giving occasional shade in the middle of sunny days till they have struck fresh root, and admit air every fine day by raising the upper ends of the glasses one or two inches, giving also occasional light waterings two or three times a week in warm weather, and defend the glasses on nights with mats, as before advised; and observing, that according as the plants rise in height, touching the glasses, raise the frame at bottom a little in proportion, then, after having four or five weeks' growth, in this bed, if they have advanced considerably so as to meet and crowd one another, it would be advisable to remove them into a third and final hot-bed, where it can be conveniently obtained, some planted into the bed, others previously potted and placed therein, as directed below.

Where convenient to afford them another hot-bed it will be of great advantage, and which will be necessary the beginning or towards the middle of May, or when the plants in the above second hot-bed are so much increased

creased in size as to interfere with or press against each other, when a third and final hot-bed should be ready in proper time for their reception, made for one or more of the largest and deepest garden frames, especially for the taller-growing plants, such as the large cock's comb, tricolors, bicolors, stramonium, balsams, egg-plants, &c. and for which a deep drawing-frame would be eligible, or a multiplying drawing frame of two or three moveable divisions, to place one upon another occasionally to augment the depth, as the rising growth of the plants may require; or, however, in default of these, any common deep frame must suffice, and this raised occasionally, either by means of props underneath, or by four posts, one at each corner, each post having holes bored on the inward side, six inches one above another, and with an iron or wooden peg for each post to place in the said holes higher or lower, on which to support the frame according as required: but where there is a fixed glass-case of proper dimensions, five or six feet wide or more, and as much in height, it would be well calculated for drawing the larger sorts of these curious Annuals, and would prove of superior advantage in bringing them to greater perfection, and therefore, where accommodated with a convenience of this kind, a final hot-bed may be made therein, it having an oblong pit formed internally, of proper width and length, eighteen inches deep or more, in which to make the bed either of hot-dung or tanner's bark; if the former, must have earth or tan at top, wherein to plunge the pots, but if the latter, plunge them into the tan-bark.

However, to proceed respecting the frame hot-bed for this purpose, it may generally be made with horse-stable dung, properly prepared (see HOT-BEDS), making it in dimensions for any of the frames above mentioned, but previously observing, that, for the more commodiously managing this business, it would be proper to have this final hot-bed made in a trench or cavity the width and length of the intended frame or frames, and sunk a foot or eighteen inches or but little more, in order to have the surface of the bed low, that the frames placed thereon may not be inconveniently too high, when occasionally raised according as the growth of the plants may require, making the bed therein two feet or two and an half thick in dung; put on the frame and glasses, and when the bed is of proper temperature of heat, earth it within the frame four or five inches deep, ready for the reception of the plants.

Then proceeding to remove the plants from

the other bed into this, observing previously, that such as are intended for pots and not planted therein before, should now be potted; and the proper sized pots are those called twenty-fours; which being ready, take up the plants from their present bed, one at a time, with a garden trowel, preserving a little ball of earth about the root; put some earth in the bottom of the pot, and set one plant in each, with the ball of earth entire, filling up round the ball and a little depth over the top with more rich mould: give some water, and directly plunge the pots in the earth of the bed, not crowded too close together, being careful to fill up all the interstices between the pots closely with the earth, that the rank steam may no where arise immediately from the dung of the bed upon the plants, which would destroy all their leaves in a short time; then directly put on the glasses close, to draw up the heat, after which raise the glasses a little at the upper ends to pass off the steam, and observe to shade the plants from the sun in the heat of the day, for the greatest part of the first week, until they have taken root.

Where any or all of the plants are intended to be forwarded in a glass-case, before mentioned, to obtain them in the best perfection with the least trouble, let the same methods be observed as above, both in making the hot-bed and placing the plants therein, and other requisite particulars, as also according to the following intimations.

Be now careful during the residence of the plants in this their final hot-bed, either under frames or in a glass-case, to admit fresh air every day in fine weather, by opening the glass more or less to strengthen the plants in their advancing growth, and to give occasional plentiful waterings, which must be afforded them two or three times a week, or as you shall see necessary, and continue to cover the glasses in cold nights with mats; give also some attention that a proper moderate heat continues in the bed, which, if much declined, may be revived a little by applying a gentle lining of hot dung to the sides, where admissible, that the plants may be continued in a free growth.

Likewise observe, according as the plants of the large sorts in the frame hot-bed advance considerably in stature, to afford them proper scope above to shoot, either by raising the frame upon props underneath, or by means of posts, one at each corner, as formerly explained, defending the vacancy below with mats nailed to the bottom part of the frame; or the depth of the frame may be augmented by some of the expedients above mentioned;

but where the hot-bed is made in a fixed glass-case of proper dimensions, and the plants being plunged therein, no further care will be required than to supply them with fresh air and proper watering, and thus, by these methods, the large taller-growing sorts of cock's combs, tricolors, bicolors, stramoniums, &c. may be drawn to a strong tall stature of three or four to five or six feet high, or more; and the other plants in proportion, such as the balsams, egg-plant and gomphrenas, according to their nature of growth.

Continue them under the above care till about the beginning or middle, or towards the latter end of June, according to their state of growth and temperature of the season; and then when advanced to some considerable size, and the weather settled in warm, should harden them gradually to the full air, by opening the glasses more considerably, and by degrees taking them off wholly, first in the day time, and then both day and night; and the plants soon after removed in their pots fully abroad into the open air, in the places where they are usually to remain during the summer, till they terminate their growth.

In disposing these plants in the garden, they should occupy some principal situation; are eligible to arrange in fore-courts and other conspicuous compartments,

They being now removed into the full air in their pots, give support where necessary to those of taller growth, by placing a neat straight stick or stake to each, and to which tie the stem in a regular manner, in an upright direction: and be careful not to omit watering the whole freely in dry weather, in which they will require it every day or two, especially where the pots are much exposed to the sun; but in any situation give sufficient watering to preserve the earth moist about the roots, that the plants may continue of a healthful, lively growth, flower well, and ripen seed and fruit in perfection.

Note. the foregoing intimations, relative to the methods practised in drawing the particular sorts of the tender Annuals of this class, herein mentioned, to a tall stature, by means of deep frames, drawing-frames, or common frames, raised as may be required, is principally to be understood for such as naturally assume some tall upright habit, such especially as the large cock's combs, tricolors and bicolors, &c. and that are particularly required in the largest possible degree of growth, sometimes five or six feet high; though those of a more robust moderate stature, of three or four feet, make a very good appearance; and the same of the other sorts according to their or-

der of growth; it, however, should be observed of the different sorts, that to obtain them in some tolerable handsome size, not less than two different hot-beds must be employed, one wherein to sow the seed and raise the plants a few inches in growth, and then transplanted into another under proper frames, to grow till the latter end of May, or beginning or middle of June.

But, as before observed, that where there is the accommodation of a glass-case of proper width, length and height, wherein to make a hot-bed in which to receive the plants from the frame-beds, all the sorts may be raised to greater perfection in size, &c. with less trouble. See *Glass-case*.

However, as to the dwarf cock's comb, &c. in their natural dwarfish growth of six or eight inches, to a foot or eighteen inches high, they do not require to be drawn up in deep frames, only being raised, and planted into another hot-bed as above, under a common frame, some planted singly in pots, and others in the earth of the bed, as may be convenient; and according as they advance in their low stature, may raise the frame only a little by degrees, keeping the glasses near the head of the plants, that they may not be drawn up much to stem in a weakly state, but continued short and robust in their peculiar natural growth, in which their flower-heads will be larger and more compact, so continuing them in the hot-bed under the glasses till the latter end of May or beginning of June, then removed to the full air, some in their pots, others planted in the borders.

To raise a supply of any of the afore-mentioned plants of this class, in common growth for the borders, sow the seed in a moderate hot-bed the middle or latter end of March, or beginning of April; and towards the end of the last-named month, or beginning of May, the plants being raised one, two, or three inches, prick them into another hot-bed six inches asunder; managing them in giving fresh air and water agreeable to the former directions till June; then planted out with balls of earth about the roots into the borders, they will grow freely, and flower in tolerable good perfection.

The requisite culture of all the sorts, when removed into the full air, is principally to give plenty of water to all those in pots, and occasionally to those in the borders, when first planted, and till fresh rooted; and to keep the whole clean from weeds, and give support of sticks where necessary.

They will all flower from June or July till the end of Autumn; and in August and September,

September, will ripen seed, which should then be gathered in proper supply in dry weather.

But to save seed in perfection, should mark some of the most perfect flowering plants, and those of other peculiar properties, and of which it should be observed, that if a cold, or wet autumn prevail, some pots of the best sorts of cock's comb, tricolors, bicolors, and double balsams, &c. should be placed in deep or raised frames, in order to have occasional shelter of the glasses of nights, cold weather, and much rain; or may be placed more beneficially in some glass-case, where any, opened a little in the front, but the top glasses continued, and the whole shut close in cold nights; for without the above precautions, these most tender plants will not ripen seed in unfavourable seasons; and therefore having conveniences as above, it would be proper to use the same precaution every season less or more, as it may appear necessary, for the greater certainty of obtaining a proper supply of good seed.

ANTHEMIS, Chamomile.

This genus furnishes upwards of twenty species of herbaceous plants, consisting of annuals and perennials; of which not more than five or six merit notice, either for use or ornament.

Class and order, *Syngenesia Polygamia Superflua*.

Characters.] CALYX is hemispherical and scaly. COROLLA, a compound radiated flower, the disc or middle composed of funnel-shaped hermaphrodite, and the radius of flat female florets. STAMINA, five filaments in the hermaphrodite flowers. PISTILLUM, a germen, simple style, and two reflexed stigmas. PERICARPIUM, none; the seeds sit naked on the receptacle.

The species of note are,

1. ANTHEMIS *nobilis*.

Common Chamomile.] Anthemis with pinnated leaves, composed of numerous minute, acute-pointed, somewhat hairy pinnae.

Varieties.] Common Chamomile with single white flowers—with double white flowers—with very large double white flowers.

2. ANTHEMIS *maritima*.

Sea Chamomile.] Anthemis with pinnated, fleshy, indented, dotted, naked leaves, trailing branching stalks, and white flowers.

3. ANTHEMIS *tomentosa*.

Downy Grecian Sea Chamomile.] Anthemis with pinnatifid, plane, obtuse, many-pointed, downy leaves, branching stalks, and white flowers.

4. ANTHEMIS *tinctoria*.

Dying Ox-eye Anthemis.] Anthemis with

tall erect stalks, doubly-pinnated sawed leaves, woolly underneath, and large flowers growing in a corymbus.

Varieties.] Common German Ox-eye Anthemis with yellow flowers.—Great Oriental Ox-eye Anthemis with sulphur-coloured flowers—with white flowers—with scarlet flowers—with pale-red flowers—and with large white flowers.

5. ANTHEMIS *Pyrethrum*.

Pellitory of Spain.] Anthemis with trailing branches, pinnated, finely divided leaves, and each branch terminated by one large flower.

All these are hardy perennials, closely adorned with numerous pinnated leaves, finely divided into a multitude of minute parts, and compound radiated flowers, but the radius is not distinct in the double kinds.

The *Anthemis nobilis* is the Odoriferous or Common Chamomile, well known for the medical virtues of its flowers, which are equally efficacious in all its varieties, and the plants merit culture in every garden. The two double kinds merit culture also as flowering plants; the common double sort is well known: its flowers, though small, are perfectly full and pretty; but those of the large double kind are almost three times as big, and are very beautiful; but the single varieties are accounted the most efficacious for medicine, though the doubles are most generally cultivated; and as flowering plants particularly, none but good double kinds should be admitted, disposed towards the front of borders, &c. and which are also sometimes planted for edgings; but they soon spread out disorderly, unless cut in on the sides occasionally in summer; they likewise are sometimes planted to cover naked banks, and in rock work, &c.

They are all low trailing plants, spreading themselves upon the surface of the earth; their branches emitting roots as they advance, and multiply exceedingly, and produce numerous flowers in June, July, and August, or even till October.

The *Anthemis maritima* and Downy Anthemis are low, bushy plants, and produce numerous flowers from July until November, and may be admitted to form variety in the compartments of pleasure grounds.

The *Anthemis tinctoria* and varieties are spreading plants, and send up branching stems a yard high, ornamented with corymbules of flowers from June until November, and make a good appearance in the flower-borders and shrubbery compartments.

The *Pellitory of Spain* hath a carrot-shaped root, and branches spreading a foot each way

on the ground, producing large solitary flowers in June and July.

The root of this species affords relief in the tooth-ach.

Propagation, &c.

The Common Chamomile and varieties are propagated by parting the roots, and by off-sets, slips and cuttings of their trailing branches.

The best season for this is March and April, although it may be done in any of the summer months. Those intended for medical use must be planted in a bed or border, in little tufts, nine inches or a foot asunder; give some water, and they will soon spread and produce plenty of flowers the same year.

If the double sorts are designed as flowering plants, set them in little bunches in different parts of the borders.

The other four species are easily raised from seed, in a bed of common earth, in March and April; likewise by slips and cuttings of their branches, in a shady border, any time in summer; afterwards transplant them into the borders or fronts of shrubberies, where they will endure many years, and flower annually.

To this genus belong also all the May-weeds of the fields, having leaves somewhat like Chamomile, and white radiated flowers, with yellow middles.

ANTHERÆ, the Apex, Summit, or Top of the Stamina, or Stamen of Flowers, and is elevated by means of the filaments. See **STAMEN** and **FILAMENTUM**.

This part of the flower, i. e. Antheræ, is of the utmost utility in the generation of plants: for according to the sexual system, it is the principal part of the male organs, and contains the fecundating pollen, or fine and coloured dust, absolutely necessary for the impregnation of the female parts of the fructification of flowers, to render them prolific or fruitful, and to fertilise the seeds, which otherwise would prove abortive.

The sexual system being founded on the supposed impregnation of the seeds by the male dust or powder contained in the Antheræ, the importance of that part of the flower is considerably augmented. See **SEXUS**.

The Antheræ produce, and, when ripe, discharge a powder called pollen, which falling upon the stigma, or female organ, is absorbed by a tough and viscid humour, with which the surface of that part is covered, and passing from thence through the style, impregnates the germen or ovary below (see **STYLUS** and **GERMEN**); and after this operation of nature, the fruit or seed immediately take their growth, which, in some plants, is

very quick and conspicuous, particularly exemplified in the cucumber; as I have often observed, that from the time of impregnating the female flower with the Antheræ of the male blossom, which I always practise to the early crops, that the fruit, from the size of a large barley-corn, have attained four, five, or six inches in length in a fortnight or three weeks; the cucumber and melons being androgynous plants, i. e. produce male and female flowers apart on the same root; that the office of fecundating the fruit naturally, is supposed to be accomplished in the general summer crops in the full ground, by the winds or insects, such as bees, flies, &c. conveying the male dust, and shedding it over the stigma or point of the female flower; but in the early crops in hot-beds, under frame and glasses, where we may suppose the winds and insects have no access, recourse is had to art, to perform the office of impregnation, or, as the gardeners call it, setting the fruit, which is effected by carrying the stamina of the male, commonly, though improperly, called the false blossom, to the female, and touching the stigma therewith, so as to leave part of the dust of the Antheræ, and in a day or two after the fruit will visibly swell. See the *Culture of Cucumbers*.

The most natural structure of the Antheræ, which obtain in the greater number of plants, is, in point of situation, placed on the top of the filament; in point of number, a single Anthera to each filament, though some plants have two, others three, four, and five Antheræ.

The connection of the Antheræ with the filament is either *Erectæ*, erect, or straight, and fastened by either end to the top of the filament; *Incumbentes*, incumbent, or placed sideways upon the filament; or *Versatilis*, veering about like a vane.

The figure and resemblance of the Antheræ is various, some are *Linearis*, linear, or slender, like a thread; *Subulata*, or awl-shaped; *Hastata*, spear, or javelin-shaped; *Bicornis*, two-horned; *Bifida*, two-parted half-way; *Biloba*, divided into two; *Sagittata*, arrow-shaped; *Cordata*, heart-shaped; *Reniformis*, kidney-shaped; *Ovata*, egg-shaped; *Globosa* or *Rotunda*, globular or round; *Trigona*, three-cornered; *Tetragona*, four-cornered; *Lunulata*, crescent, or moon-shaped; *Acuta*, sharp, terminated in an acute angle; *Acuminata*, tapering to a point; *Obtusa*, obtuse, or blunt; *Disjuncta*, distinct, or unconnected with each other; *Connivens*, approaching each other; *Incurva*, bowed, or crooked; *Villosa*, hairy and woolly; *Hirsuta*, rough and hairy; *Membranacea*, membranaceous or hard,

hard, like parchment; *Pellucida*, shining or transparent.

ANTHERICUM, Spider-Wort.

The plants are mostly herbaceous, perennial, and of the flowery kind, grow with many long narrow leaves, and upright flower-stalks, obtaining in stature, in different species, from three inches to three feet, adorned with hexapetalous liliaceous flowers, disposed in spikes.

Class and order, *Hexandria Monogynia*.

Characters.] CALYX, none. COROLLA, six obtuse spreading petals. STAMINA, six filaments, and incumbent furrowed antheræ. PISTILLUM, a trigonous germen, simple style, and trigonous stigma. PERICARPIMUM, a smooth three-furrowed capsule, of three cells, containing many seeds.

There are above thirty species; those that claim attention are,

1. ANTHERICUM *revolutum*.

Revolute-flowered Anthericum.] Anthericum with flat rough leaves, erect branching stalks, two feet high, each branch terminated by a loose spike of white flowers, having the petals rolled back.

2. ANTHERICUM *ramosum*.

Ramose-stalked plane-flowered Anthericum.] Anthericum with flat leaves, erect very branching stalks, two feet high, each branch terminated by a loose spike of white flowers, with straight petals.

3. ANTHERICUM *Liliago*.

Liliaceous, Grass-leaved, or Single-stalked Anthericum.] Anthericum with long, plane, flat leaves, an erect unbranched stalk, a foot and half high, supporting one loose spike of white flowers.

4. ANTHERICUM *Liliastrum*.

St. Bruno's Lily, or Savoy Spider-wort.] Anthericum with long, plane, flat, erect leaves, erect undivided stalk, fifteen or eighteen inches high, and large bell-shaped, lily-white, odoriferous flowers at top of the stalk, hanging on one side, which are very pretty, but rarely endure five or six days.

5. ANTHERICUM *frutescens*.

Shrubby-stalked Anthericum, or Onion-leaved Aloc.] Anthericum with several shrubby branches from the root, each supporting a head of columnar, onion-like, fleshy leaves, and loose spikes of yellow flowers.

6. ANTHERICUM *alocoides*.

Aloe-leaved Anthericum.] Anthericum with broad, flat, awl-shaped, fleshy leaves, rising from the root, spreading on the ground, and loose spikes of yellow flowers rising among the leaves.

7. ANTHERICUM *Asphodeloides*.

Mock-Asphodel Anthericum.] Anthericum

with long, narrow, awl-shaped, half-columnar-tapered, fleshy leaves, gathered close together, and loose spikes of yellow flowers rising among the leaves.

The four first species are hardy exotic perennials, the roots are mostly fleshy tubers, especially the three first; the leaves and stems rise from the root annually in spring, flower in June and July, and ripen seed in autumn.

All these are proper furniture for the principal compartments of the pleasure-ground.

The *Anthericum frutescens*, *alocoides*, and *Asphodeloides*, (natives of the Cape of Good-Hope) are green-house plants, so must be retained always in pots; they are succulent, and retain their leaves, and flower at different seasons, and often perfect seeds.

The flowers of all the sorts are liliaceous, and composed each of six equal petals. See its *Characters*.

Propagation.

They are propagated by seed, and by root off-sets and suckers; but, as some sorts do not furnish off-sets plentifully, they may be raised abundantly from seed, such as the *anthericum revolutum*, *ramosum*, and *Liliago*: sow the seed in autumn or spring, in a bed or border of light earth, and the plants will rise freely in April or May; which, in autumn, when the leaves decay, transplant in a fresh-prepared bed, and about nine inches asunder to have a year's growth, then removed into the flower borders, and finally to remain for flowering.

And as the above three sorts sometimes afford bottom off-sets, they should be detached from the parent root in autumn or spring, and planted for increase.

The St. Bruno's Lily multiplies freely by off-sets of the roots, which may be divided in autumn, planting the small slips in a nursery-bed for a year, and the larger ones at once where they are to remain.

The three green-house kinds may be raised from seed, but they increase exceedingly by off-sets or suckers, which may be taken off in summer or autumn, and planted in pots of light sandy earth, and in winter must have the shelter of a green-house or garden-frame, and managed as other succulent plants.

ANTHOLYZA, sometimes called Æthiopian Corn-Flag.

The plants are herbaceous perennials, of the bulbous-rooted tribe, producing stalks from one to two feet high, ornamented with clusters of large monopetalous flowers, of singular structure and beauty.

Class and order, *Triandria Monogynia*.

Characters.] CALYX is a spatha. COROLLA, one irregular ringent petal, tubular below,

below, widening gradually to a large compressed ringent mouth, the upper lip very long and erect, with two short wings at the base; the under lip short and trifid. STAMINA, three long filaments, and pointed antheræ. PISTILLUM, a germen below the corolla, slender style, and trifid stigma. PERICARPUM, a trigonous capsule of three cells, and many seeds.

The species of most note are,

1. ANTHOLYZA *ringens*.

Gaping scarlet Antholyza.] Antholyza with narrow, rough, furrowed leaves, a foot long; round hairy flower-stalk, two feet high, ornamented upward with several red flowers, having the throat compressed, and divaricated gaping lips.

2. ANTHOLYZA *plicata*.

Plaited-leaved Antholyza.] Antholyza with long, narrow, deeply-furrowed leaves, plicate, or lapping over one another; a flower-stem eighteen inches high, and ringent flowers; the corolla shorter than the stamens.

3. ANTHOLYZA *æthiopica*.

Æthiopian Crimson Antholyza.] Antholyza with long, narrow, deep green leaves; a round flower-stem a foot high, the top ornamented with large, incurved, crimson flowers.

4. ANTHOLYZA *Cunonia*.

Scarlet-flowered Antholyza.] Antholyza with narrow, sword-shaped, pointed leaves, nine inches long, rising in autumn, and the flower-stem in spring, twelve to eighteen inches high, ornamented upward with large scarlet flowers, having the upper segment extended, and two outer lobes broader, ascending.

5. ANTHOLYZA *Meriana*.

Red-flowered Antholyza, or Watsonia.] Antholyza with linear, sword-shaped leaves, upright flower-stem a foot and half high, adorned above with funnel-shaped red flowers.

These are exotics of Africa, and require the protection of a stove or good green-house in winter, so must be always retained in pots.

They have bulbous perennial roots, but the leaves and stems are annual, the leaves rising, some in autumn, and the flower-stems in spring, producing the flowers in May and June; which are elegant and curious in structure, being universally monopetalous, long, hollow, divided into six irregular segments, one of which is considerably extended, the whole extremely singular and beautiful, and are succeeded by plenty of ripe seeds in autumn.

Their propagation is by off-sets from the roots which may be taken up and separated when the leaves decay.

They may also be propagated with facility by seeds sown in autumn, in pots of light earth, which place in the green-house in winter, and the plants will appear in spring; and in two years transplant them into separate pots, to remain for flowering.

The plants may be continued in the pots unremoved one, two, or three years; then when the flower-stalks decay in summer, July, or August, may be taken up as required, both to separate the increased off-sets, and to replant the main bulbs in fresh earth, either directly, or kept till September or October, then finally planted: the off-sets plant also in pots, three or four together, to have one or two years' growth, then transplanted singly, when their leaves decay, in summer or autumn; and will flower strong the year following.

ANTHOSPERMUM, Amber-Tree.

This is a beautiful, evergreen, odoriferous shrub, of the green-house.

Class and order, *Polygamia Diœcia*, i. e. hermaphrodite, and male and female flowers upon one plants, and only males or females upon another.

There are two species,

1. ANTHOSPERMUM *æthiopicum*.

Æthiopian Smooth Amber-Tree.] Anthospermum with an erect very branching stem, and numerous very small, smooth leaves.

2. ANTHOSPERMUM *ciliare*.

Ciliated Cape Anthospermum.] Anthospermum with procumbent or trailing stalks, eight or ten inches long, and narrow spear-shaped leaves, having hairy borders.

The *Anthospermum æthiopicum* is the sort most commonly known here; it is a low shrub, the stem erect, and divides into numerous slender branches, closely covered with very small, lanceolate, evergreen, fragrant leaves, and flowers from the sides of the branches, which being devoid of petals, have no beauty; so that the merit of the plant is its being a pretty evergreen, of delightful fragrance.

Both these species require the shield of a green-house or hot-house in winter, so must be cultivated in pots.

The propagation of both sorts is effected by cuttings and layers of their young branches; the cuttings may be planted in May, June, or July, either in pots, or in a bed or border, giving occasional shade, and they will be fit to transplant into separate pots in two or three months.

ANTHYLLIS, *Barba Jovis*, or Jupiter's Beard; also Silver Bush.

This genus furnishes evergreen shrubs and herbaceous plants; the former chiefly merit culture, which are exotics of the green-house,

adorned with compound leaves, and papilionaceous, or butterfly-shaped flowers.

Class and order, *Diadelphia Decandria*.

Characters.] CALYX, monophyllous, swelling, five-parted, and permanent. COROLLA is papilionaceous, the standard long, both sides reflexed, the wings and keel short. STAMINA, ten filaments, simple antheræ. PISTILLUM, an oblong germen, simple style and stigma. PERICARPIUM, a roundish pod, having one or two seeds.

The principal shrubby species are,

1. ANTHYLLIS *Barba Jovis*.

Common Barba Jovis, or Jupiter's Beard.]

Anthyllis with shrubby stem and branches, nine or ten feet high, ornamented with winged silvery leaves, composed of many lobes, and bright yellow flowers in bunches at the ends of the branches.

2. ANTHYLLIS *cytisoides*.

Ternate cytisus-like hoary-leaved Spanish Barba Jovis.] Anthyllis with shrubby stem and branches, two feet high, ternate leaves composed of three oval hoary lobes, and yellow flowers, by twos or threes from the sides of the branches.

3. ANTHYLLIS *heterophyllis*.

Variable-leaved dwarf Portugal Barba Jovis.] Anthyllis with low shrubby stem and branches, spreading near the ground, pinnated silvery leaves, terminated by an odd lobe, and small variegated flowers at the ends of the branches.

4. ANTHYLLIS *hermanniae*.

Cretan Ternate-leaved Barba Jovis.] Anthyllis with shrubby stem and branches, rising five feet high, ternate leaves, and yellow flowers in clusters from the sides of the branches.

5. ANTHYLLIS *Erinacea*.

Prickly Anthyllis.] Anthyllis with shrubby and very prickly stem and branches, growing six or eight feet high, oval simple leaves, and purplish flowers.

6. ANTHYLLIS *indica*.

Indian Anthyllis.] Anthyllis with a large and shrubby stem, scandent unarmed branches, unequal pinnate leaves and flowers, with a red calyx and white corolla.

These are all exotic evergreens of the greenhouse; so must be always kept in pots for the convenience of moving them in and out occasionally.

The first five species are natives of Portugal, Spain, Italy, and Greece; and the last of Cochin-China.

The *Anthyllis Barba Jovis* is a most beautiful evergreen shrub, although it may be said to be white, for the leaves appear of a silvery

white colour, hence it is sometimes called Silver Bush.

The *Anthyllis cytisoides* is also a pretty hoary shrub. All the sorts flower annually in June and July; the flowers are often succeeded by ripe seeds in autumn. The propagation of all the species is by seeds, cuttings, and layers.

By seeds: sow them in pots in spring, which plunge in a moderate hot-bed just to bring up the plants, and they must afterwards be planted in separate pots.

By cuttings: plant them in May or June, in a shady border, and they will be well-rooted by autumn.

Layers of the young branches may be performed at any time.

The following are herbaceous species of this genus.

1. ANTHYLLIS *montana*.

Mountain Herbaceous Anthyllis, or Purple Milk Vetch.] Anthyllis with trailing stalks, winged hairy leaves, having an equal number of lobes, and purple flowers in globular heads at the ends of the branches.

2. ANTHYLLIS *Vulneraria*.

Scarlet Lady's Finger.] Anthyllis with slender stalks, winged leaves, of two or three pair of lobes, terminated by an odd one, and double heads of scarlet flowers at the ends of the stalks.

They are hardy perennials, and proper furniture for the pleasure-ground, and may be raised from seed in autumn or spring, and by parting their roots.

ANTIRRHINUM, Snap-Dragon, or Calf's-Snout; also *Linaria*, or Toad-Flax, or Frog's-Mouth.

The plants are herbaceous, and of the flowery kind, producing erect stalks from one to three feet high, terminated by long erect spikes of numerous monopetalous ringent flowers.

The Snap-Dragons are often seen growing upon walls and ruins.

Class and order, *Didynamia Angiospermia*.

Characters.] CALYX is monophyllous, and deeply five-parted. COROLLA is monopetalous and ringent, the tube oblong, swelling, and opening above with a mouth, having two lips, the upper one two-parted and reflexed on each side, the under one trifid and obtuse, and a prominent nectarium at the base of the flower. STAMINA, two short and two long filaments. PISTILLUM, a roundish germen, simple style, and stigma. PERICARPIUM, a roundish capsule, having many seeds.

There are above fifty species of this genus: those for our purpose, and of most note, are, first, the four following of the Snap-Dragon *Antirrhinums*.

Antirrhinums, distinguished from the *Linaria* by having the nectarium of the flower but very little prominent, which, in the Toad-Flax, is extended at the base of the corolla like a spur or horn.

1. *ANTIRRHINUM majus*.

Great Perennial Snap-Dragon.] Antirrhinum with erect stems, two or three feet high; spear-shaped leaves, having foot-stalks, and the stem terminated by a long spike of many large flowers.

Varieties.] Great Perennial Snap-Dragon with red flowers—with white flowers—white and red flowers—with white-mouthed red flowers—with yellow flowers—yellow and red flowers—yellow and white flowers—with purple flowers—purple and white shaded flowers—and Variegated-leaved Great Snap-Dragon with flowers of different colours.

2. *ANTIRRHINUM latifolium*.

Broad-leaved Greatest Perennial Snap-Dragon.] Antirrhinum with erect stems, a yard high; broad, spear-shaped, smooth leaves, on short foot-stalks, and the stem terminated by a very long spike of many elegant large flowers.

Varieties.] The flowers of many different colours like the former.

3. *ANTIRRHINUM italicum*.

Italian Perennial White Snap-Dragon.] Antirrhinum with stems two feet high, very long, narrow, spear-shaped, hairy leaves, the stems adorned at top with a short robust spike of large white flowers.

4. *ANTIRRHINUM ficulum*.

Sicilian Annual White Snap-Dragon.] Antirrhinum with stems fifteen inches high, narrow spear-shaped alternate leaves, white flowers with purple bottoms, arising singly on long foot-stalks from the sides of the branches.

The following are the *Linarias*, or Toad-Flax *Antirrhinums*, distinguishable from the Snap-Dragons by the flower being terminated behind by the nectarium, like a spur or horn, on which consideration, they were formerly ranged as a distinct genus (*Linaria*); but Linæus places them among the *Antirrhinums*.

5. *ANTIRRHINUM, Linaria vulgaris*.

Common Toad-Flax.] Antirrhinum with many erect stems, eighteen inches high, adorned below with numerous, very narrow, spear-shaped, grey leaves, in clusters, and each stem terminated by a long spike of many close-sitting flowers.

Varieties.] Common large Toad-Flax with yellow flowers, and golden chaps.—Large White Toad-Flax—Small Yellow Toad-Flax.

6. *ANTIRRHINUM purpureum*.

Great Purple Sweet-scented Linaria.] Antirrhinum with many erect, branching, very

flowery stems, a yard high, long, narrow, spear-shaped leaves, placed sparsely, all the stems terminated by long loose spikes of many large purple, sweet-scented flowers.

7. *ANTIRRHINUM triste*.

Dark-flowered Gibraltar Toad-Flax.] Antirrhinum with many declinated succulent stalks, hardly a foot long, very short, narrow, succulent leaves, opposite below, but irregular above, the stems terminated by clusters of close-sitting sad-purple flowers, with dark purple chaps, and striped awl-shaped nectariums.

Varieties.] Light-purple-flowered—brownish-purple—yellow.

8. *ANTIRRHINUM arvense*.

Wild Blue Toad-Flax.] Antirrhinum with many erect, very branchy stems, two feet high, narrow leaves in whorls below, by pairs or singly above, and all the stems and branches terminated by loose spikes of many small blue flowers.

Variety.] Field Toad-Flax with yellow flowers.

9. *ANTIRRHINUM dalmaticum*.

Dalmatian Shrubby Yellow Toad-Flax.] Antirrhinum with a strong, erect, woody stem, a yard high, broad, spear-shaped, alternate, close-sitting leaves, and large deep-yellow flowers, in loose spikes, at the ends of the branches.

10. *ANTIRRHINUM triphyllum*.

Three-leaved Annual Toad-Flax.] Antirrhinum with erect branchy stems, near two feet high, oval smooth leaves by threes, and short spikes of flowers terminate the branches.

Varieties are,] Three-leaved Toad-Flax with yellow flowers—yellow with purple standard and spur—with purple flowers.

11. *ANTIRRHINUM monspessulanum*.

Montpelier Perennial Toad-flax.] Antirrhinum, with erect branching stems two feet high, narrow linear leaves, crowded in clusters; and terminal spikes of blue, sweet-scented flowers, with short spurs.

12. *ANTIRRHINUM sparteum*.

Twiggy, Branching Annual Toad-flax.]—Antirrhinum, with a short erect smooth stem a foot high, slender branches, awl-shaped, fleshy-leaves, and racemose bunches of large yellow flowers.

13. *ANTIRRHINUM alpinum*.

Alpine Perennial Purple Toad-flax.] Antirrhinum with slender, branching stems, six or eight inches high; linear spear-shaped leaves by fours; and terminal clusters of violet-purple flowers.

All the above species of *Antirrhinums* are principally herbaceous and hardy: of which, the *Antirrhinum ficulum*, *triphyllum*, and *sparteum* are annual, the others perennial:

all

all adapted to cultivate as ornamental flowering plants in borders, beds, and other compartments of the pleasure-ground; in which the snap-dragon kinds appear the most conspicuous and showy; but most of the others are also very floriferous and ornamental: and the whole displays a very pretty variety in summer: and some continue flowering the greatest part of that season and autumn: and being mostly of hardy growth, will succeed in any common soil and situation: though the *Antirrhinum triste* and *dalmaticum* are rather somewhat tender, liable to suffer by severe frost, when fully exposed in winter.

The roots are fibrous, the stems rise several from each root, and the leaves are universally simple, and mostly long and narrow.

The flowers are formed of one hollow, grinning petal, resembling the snout and mouth of an animal: hence the names Snap-Dragon, Calf's-Snout, Frog's Mouth, &c.

They are all easily raised: the Annuals by seed every year in the spring, generally to remain where sown: and the perennials both by seed in the same season, and by parting the roots in spring or autumn, and by cuttings and slips of the stalks, &c. in summer; and once raised, continue of several years' duration.

Culture of the Snap-Dragon Kinds.

The Snap-Dragon *Antirrhinums* are extremely pretty garden flowers, but more particularly those of the *Antirrhinum majus* and *latifolium*, and are of remarkably easy culture, as is obvious by the plants rising spontaneously from the self-sown or scattered seeds, even out of the crevices of walls, buildings, and ruins, so that they are also good furniture for artificial ruins, rock-work, &c. And in gardens, those that grow in dry, sandy, gravelly, rubbishy, or any dry hungry soil, are also of several years' duration; though in rich land they grow strongest, and the flowers will be more large and elegant; in which soil, however, they are apt to acquire a luxuriance or sponginess, and rarely abide longer than one or two years; but this is no inconvenience, since they may be raised plentifully by seed and by slips and cuttings.

They flower from June to the end of summer, and ripen plenty of seed in autumn.

The seeds may be sown in March, April, and May; those sown in March and April will flower the same year in autumn, and the others the year following. Sow them in a bed of light soil, and when the plants are three inches high, transplant them; or those you intend shall blow the same year, may be sown in patches where they are to flower, as directed for hardy annuals.

By slips and cuttings is the method to con-

tinue the variegated-leaved sort; any of the others will also grow freely by cuttings in a shady border in summer.

The variegated kind is rather impatient of severe frost, and a few plants should be potted to be housed in winter.

Culture of the Toad-Flax Kinds.

Of the Toad-Flax *Antirrhinums*, the first six species are the most noted or generally known in our gardens; though all the sorts here enumerated are very eligible as ornamental flowering plants for the general flower-borders, and other similar decorative compartments of pleasure-grounds, &c. they mostly all flower in June, July, and continue in long succession; some till the end of summer, and are succeeded in most of the sorts by ripe seeds in autumn.

The Common Toad-Flax grows wild by the way-sides, and sides of banks, hedges, and in pastures, as also the *Antirrhinum arvense*; but by culture in gardens they grow strong, and produce larger flowers.

All the sorts may be raised plentifully from seed, the same as the Snap-Dragons; and the perennial sorts also by parting the roots in spring or autumn.

The Dalmatian *Linaria* and *Antirrhinum triste* being somewhat tender, some plants should be potted to be housed in winter, in a greenhouse or garden-frame, and some may be planted in warm dry borders; they flower in June and July, but rarely afford seeds here.

They are easily increased by slips and cuttings of their branches in summer, or by parting their roots in autumn.

APETALUS *Flos*, i. e. Apetalous Flower. By botanists, a flower is said to be Apetalous, that wants the corolla, petals, or flower-leaves.

Of this sort are many of the amentaceous flowers, mosses, ferns, and grasses.

APIUM, Parsley, likewise Celery and Smalage.

By the laws of botany this genus comprehends all the sorts of Parsley and Celery, all of which are useful herbaceous biennials, of the kitchen-garden.

Class and order, *Pentandria Digynia*.

Characters.] The flowers grow in compound umbels, each umbel composed of many florets, each floret of five petals, five stamens, two styles, and succeeded by two seeds.

The species are,

1. **APIUM** *Petroselinum*.

Common Parsley.] Apium with spreading radical leaves divided, ternate, and subdivided into many smaller lobes.

Varieties.] Common plane-leaved Parsley—Curled-leaved Parsley.

2. **APIUM** *latifolium*.

Broad-leaved large-rooted Parsley.] *Apium* with a large, white, carrot-shaped, sweet, eatable root, larger radical leaves divided into three cut-ferrated large subdivided lobes, and supported on very long foot-stalks.

3. *APIUM dulce.*

Sweet Apium, or Common Upright Celery.] *Apium* with large, pinnated, upright leaves, supported on long, erect, thick foot-stalks, the folioles of the leaves composed of three to five ferrated lobes.

Of this species the varieties are,] Common Upright Celery with the stalks of the leaves fistular or hollow.—Common Upright Celery with the stalks of the leaves solid; known by the names of Hollow Celery, and Solid Celery.—Giant Upright Celery, growing very tall, with a large body of thick fleshy leaf-stalks.

4. *APIUM rapaceum.*

Turnep-rooted Spreading Celery, or Celeriac.] *Apium* with a large round turnep-shaped root, pinnated spreading leaves on short foot-stalks, and the folioles of the leaves composed of three to five ferrated lobes.

5. *APIUM graveolens.*

Smallage.] *Apium* with cauline leaves, having wedge-shaped lobes.

All these plants are herbaceous, and of hardy growth, and all of the biennial tribe, i. e. of only two years' duration: the first year they produce only leaves, and attain perfection for kitchen and other domestic uses; the second spring they shoot up stalks, flower, and perfect seed, and in autumn perish root and branch; so that they continue useful only one year, and a fresh supply must be raised annually from seed.

Some of the species may be deemed annual, as if sown very early, they run to seed the same year, particularly the Celery.

First, of the Common Parsley.

The two varieties of the *Apium Petroselinum*, i. e. the Plane and Curled Parsley, are most useful culinary and medical herbs, their leaves being in great request for various kitchen uses, and their roots for medicine.

With respect to the properties of these two varieties of *Apium* for use, their virtues are the same both for food and medicine; the plane-leaved sort is most commonly cultivated, but many prefer the curled kind, for these reasons, because its leaves are easily distinguished from those of the *Æthusa*, or Fool's-Parsley, a sort of hemlock, and a poisonous garden weed, which, while young, has great resemblance to the Common plane-leaved Parsley (see *ÆTHUSA*). Likewise, the Curled Parsley having larger and thicker leaves, and being curiously embriated and curled,

appearing full and double, makes a pretty appearance in its growth, and is greatly esteemed by cooks as a fine garnish to dishes. It, however, should be remarked, that this sort, as being only a variety, will degenerate to the common plane sort, unless particular care is taken to save the seeds always from the perfect, full-curled plants.

Both the varieties of Common Parsley are propagated by seed sown where the plants are to remain, annually in spring, for the plants are biennials, rising from seed in March, April, or May; continue useful until that time twelvemonth, then shoot up into stalks, perfect seed, and perish.

The season for sowing both varieties, is any time from the beginning of February until the beginning of May, though they will grow almost any time of the year; however, to have the plants come in for use by the time the old Parsley begins to run, it is proper to sow in February or March, and the plants will be fit to cut in May, or beginning of June.

It is most eligible to sow this seed in drills, as it will be more convenient to clean and gather the herbs for use. Where only a sufficiency is required for the supply of a family, it may be sown in a single drill along the edges of the borders, or quarters of the kitchen garden, and the plants will serve a double purpose; for they will form an edging, and give an air of regularity and neatness to the place, at the same time yield their produce plentifully; but for the supply of markets, the London gardeners sow it also in large plats, either in broad-cast, and rake it in, or in shallow drills, eight or nine inches distance, and trim the earth evenly over it, near half an inch deep, and lightly rake the surface smooth.

This seed is so extremely slow in its vegetative motion, that its germination, or at least, the appearance of the plants, is not to be expected in less than a month, or sometimes five or six weeks.

All the culture the plants require is to be kept clean from weeds, and when they at any time grow faster than is wanted for use, as is often the case in private gardens, they, when grown rank and spreading, should be cut down close; this should be particularly practised in autumn, i. e. about Michaelmas, time enough for the plants to recover before winter; and numerous young leaves will rise from the roots, and form a thick compact edging.

To save Parsley seed, permit some rows of the one year old plants to stand, and they will shoot up their stalks in May and June, and ripen seed abundantly in July and August.

Of the Second Species, Broad-leaved large-rooted Parsley.

The *Apium latifolium*, or Broad-leaved Parsley, is esteemed for its large roots, which are boiled and eaten as sauce to flesh meat.

These roots are white and carrot-shaped, being long, taper, and of downright growth, and often attain the size and appearance of small or middling parsneps; they boil exceeding tender and palatable, are very wholesome, and may be used in soup or broth, or to eat like carrots and parsneps; the use of them is greatly recommended to persons that are subject to the gravel: in decays also they are found very efficacious.

They are raised in great perfection by the London gardeners, who supply the markets with them in bunches.

Their season for use is from July until Christmas, or even till March or April.

The propagation of this species of *Apium* is by seed sown where the plants are to remain, annually in February, March, or April. Chuse a spot of light rich earth, in an open exposure; sow the seed broad-cast, and rake it in: the plants will appear in April, and in May or June they will require to be thinned, and cleared from weeds, which may be performed either by hand or hoe; but the latter is most eligible, as it will stir and loosen the surface, which will be beneficial to the plants, cutting them out to about six inches distance.

In the latter end of July the roots will have attained a due size for use, when some may be drawn occasionally; but they do not acquire their full growth until Michaelmas.

This sort is sometimes called *Hamburgh Parsley*, because the plants are greatly cultivated in the gardens near that city.

Of the Third Species, Common Celery.

The *Apium dulce*, or Common Celery, in both its varieties, is in universal esteem as a culinary and salad herb, and the stalks of its leaves are the only parts used, which are excellent in soups, and for stewing; and as an autumnal and winter salad herb, it surpasses many others. It may be obtained for use nine or ten months in the year, that is, from July until the middle or end of May; but the season of its greatest perfection is from about the middle or latter end of August till Christmas, or even till March, if the winter do not prove severe.

All the varieties are of upright growth, and attain two feet and half to a yard in height, and, by the culture of planting them out in trenches, together with several repetitions of earthing up their stalks as they advance in stature, they become very white, tender, and

palatable, which otherwise would be tough, and rank-tasted.

The Hollow Celery is the original variety, having been long known before the solid kind: the stalks of the latter having no hollow or vacancy in the middle as the former, is the principal difference; for they possess equal properties for general use, though the solid kind is often preferred for soups and stewing; but we however do not recommend it for a general winter crop, because it will not endure frost so well as the common Hollow Celery; nor is the giant celery so proper for a general winter-standing crop; is very large and fine, but is more eligible for autumn and early part of winter; by reason of its tall growth being more liable to the injuries of rigorous frosts; so is more advisable to cultivate most of the Common Celery for the main crops in general; and some of the others occasionally as secondaries, principally for autumn use, or till November or December.

Their propagation and culture are as follow.

They are propagated by seed sown in the spring, and when the plants have attained six or eight inches in height, they are to be transplanted into trenches, in order to be earthed up on each side as they advance in growth, to blanch or whiten their stalks, to render them crisp and tender. See *Transplanting* and *Earthing them up*.

A fresh supply of plants must be raised annually, for the plants continue useful but one year.

The proper periods of time for sowing it, are, that, if a regular succession of plants is required eight or nine months in the year, it is necessary to perform two or three different sowings from the beginning of March until the middle of May.

As for example, if it is intended to have Celery for use as early as possible in summer, i. e. in July, sow some seed the first week in March, on a warm border; or to bring the plants more forward, in a slender hot-bed; or if you are anxious to have very early Celery, some seed may be sown in the middle of February; but as these very early sown plants are apt to pipe, or run for seed the same year, before they attain half their perfection, a few should only be raised.

But for the general or principal crops, to come in for autumn and winter service, that is, in August or September, and continue in perfection till Christmas or spring, the seed should be sown about the middle or towards the latter end of March, or in the first or second week in April, in a bed of natural earth, in an

open exposure; and if a little more is sown in the latter end of the last-named month, or in the first or second week in May, it will furnish a later crop to come in for use the beginning of November, and continue good until March and April following; but to have a late crop principally for spring, should sow in May a small portion; and by planting some in shallow trenches about Michaelmas, and in October and November, they will be fit for use in March and April, and continue without running till the middle or latter end of May following.

We observed above, that the early crop may either be sown upon a warm border of natural earth, or upon a hot-bed of slender structure; by the latter practice, the plants may be so forwarded as to be fit to transplant into trenches sooner by three weeks or a month, than those raised in the natural ground; a small bed, about eighteen or twenty inches depth of dung, will be sufficient, which may be sheltered either with a small frame, or occasionally with mats supported on arches; lay thereon five or six inches of rich light earth, sow the seed on the surface, and cover it near a quarter of an inch deep; when the plants appear, admit the full air freely in mild days, but shelter them with a glass or mats on nights, until they acquire some strength, and give frequent light watering; and when the plants of either sowing are two inches high, some of the stoutest should be pricked out into a bed of rich earth, in a sheltered situation, three inches apart; or to bring them still more forward, some might be pricked upon a slender hot-bed, occasionally sheltered with mats, giving water and occasional shade till they have struck root; and if rain do not fall, refresh them frequently with water, as you shall see necessary.

Those that were first pricked out, will, in May or the beginning of June, be five or six inches high, when some of the strongest should be transplanted into trenches, in order to their being blanched. See *Transplanting into Trenches*.

With regard to sowing the main and latter crops, observe the following directions.

At the times above noticed, make choice of a spot of rich light earth, in an open situation, and let it be then neatly dug, and divided into one or more beds; but one bed is sufficient for private use, which should be three feet and half wide, making the surface level and smooth; this done, the seed may either be sown on the surface, and raked in lightly, or otherwise first rake the surface fine, then sow

the seed, and sift earth over it near a quarter of an inch thick; or the bed being first raked smooth as above, then, with the back of a rake, shove the earth from off the surface a quarter of an inch deep into the alley; sow the seed, and then with the rake turned the right way, teeth downward, draw the earth on the bed again, with a kind of jerk, that it may spread and cover the seed equally in every part.

When the plants of either sowing are come up, they should, in dry weather, be frequently watered; do not omit this, particularly whilst the plants are young.

When the plants of each sowing are about three or four inches high, it is advisable to thin the seed-bed by pricking out a quantity of the strongest into an open rich spot, properly dug and divided into beds three feet and half wide, taking opportunity, if possible, of moist weather, and prick the plants therein, in rows six inches asunder, and three or four inches distant in each row, giving water, which, if dry weather succeeds, should be occasionally repeated, till they strike fresh root, in which bed they are to remain a month or five or six weeks to acquire due strength, previous to their being transplanted into trenches, in order for blanching.

The same seed-bed will afford three, four, or more different drawings to prick out as above, by observing to thin out the largest regularly each time, before they draw each other weak by close standing, and prick them in beds till the ground intended for the trenches is at liberty, they will be advancing in their growth, and will be considerably better prepared, than such as have remained all the time in the seed-bed.

Transplanting them into the Trenches.

The season for transplanting these plants into the trenches for blanching, is occasionally from the middle of May until the latter end of October, or even middle of November, according to the forwardness of the plants, the time they are required for use, and the time it is intended they shall continue.

Observe, that when the plants are from about six to ten or twelve inches high, they are of a proper size for transplanting into the trenches.

It is necessary always to make, at least, three different plantations, allowing the distance of three or four weeks between each time of planting; but when the plants are required for use as early in summer as possible, and to be continued as late in spring as the middle or latter end of May, it is eligible to plant four, five, or six different crops, allowing the distance of time above mentioned between the planting each

each separate crop; and observe that the crops intended principally for spring use, i. e. March, April, and May, should be of the latest sown plants, and not be planted in the trenches until September, October, and beginning of November.

The manner of making the trenches, and transplanting the plants therein, is as follows.

Make choice of a rich spot of ground, in an open quarter; and if there be any weeds, hoe the ground, and rake them off; then, with a line and spade, mark and chop out the trenches cross-ways the piece of ground, each trench twelve inches or one spade wide, and allow a space of three feet between trench and trench, that there may be sufficient scope to have a due portion of earth to land up the plants a proper height; the trenches being thus marked, then proceed to dig them out to form the cavity for the reception of the plants; observe to dig out each trench long-ways a moderate spade, or about six or eight inches deep, without taking out any shovelling, laying the spits of earth alternately to the right and left in the spaces between, levelling it neatly, and beating up the edges firm and straight, and then let the bottom be properly dug and levelled; or if the ground is poor, you may first spread therein two or three inches depth of rotten dung, and dig it in four or five inches deep.

The trenches being ready, draw a quantity of the best plants, trim off the ends of their roots, and the tops of the straggling leaves; then plant one row exactly along the middle of each trench, placing the plants four or five inches distance; and directly give a hearty watering out of a pot with the rose on, which, if showers do not fall, should be repeated every other evening at least, till the plants have taken fresh root.

Do not plant out many of the very early plants, i. e. those sown in February, or early in March, because they are apt to pipe almost as soon as they are blanched, or sometimes before that is fully effected.

When it happens that the plants intended to plant in autumn for the late crops have, by the allotted compartment of ground for their reception not being vacant, stood so long in the seed or pricking-out bed, as to become rank, and draw each other up weak; it would be proper to retard their running up tall, in order to obtain them of robust growth against October and November, to plant in shallow trenches; and to effect this it is advisable, in August or beginning of September, either to cut them down low to shoot out again, or transplant them in rows nine inches distance.

Earthing, or Landing up the Plants.

As we before noticed, these plants, in order to whiten or blanch the stalks, and render them crisp, tender, and of a grateful flavour, should, according as they rise in height, be earthed or landed up on each side, using for that purpose the earth that was dug out of the trenches, and when that is expended, that in the spaces between them must be dug, broken, and used repeatedly as the plants advance in growth, thereby blanching them ten or twelve to fifteen or eighteen inches length or more.

The proper period to begin this work of earthing, is when the plants are about ten or twelve inches high, and which should be repeated every fortnight or three weeks, as you shall see necessary, during their principal growth.

In performing this work, regard must be had to break the earth, where lumpy, moderately small with the spade; or the first and second earthing may be performed with a large hoe; but generally with a spade afterwards in the principal earthings; being always careful to trim the earth up lightly to the plants with attention, not to break the stalks of the leaves, nor force the mould into their hearts. At the first time of earthing, you may land them three, four, or five inches, according to the size and height of the plants, observing the same rule at each time of earthing them, till they are by degrees landed at least twelve, but if fifteen or twenty inches, the better; by which means, if the soil is rich, those of the main crop that are planted out in the end of June, or in July, sometimes make such progress, that if properly followed up with earth, they will, by September and October, be blanched eighteen inches, or near two feet in length.

The above work of earthing is to be continued to the latter crops, occasionally, until Christmas, or as long as the plants continue to grow in height during the winter; at which season, i. e. November and December, it is proper to land them up pretty near their tops, previous to hard frost setting in, which often destroys such part of the plants as is out of the ground, which, if of considerable length, would occasion the decay of most of the other parts within the earth.

But in the late crops, planted in October or November for spring, such plants as are of small or low growth, will, probably, require but little or no earthing till February or March; at which time continue to land them up moderately, according to their growth, to have them for use in April and May after the general crops are done.

In performing the different landings up, let it

it always, if possible, be done when the plants are dry; otherwise they are apt to become spotted and cankered.

Of taking up the Plants for Use.

Some of the first ~~landed~~ up plants, if they were planted in trenches in May or beginning of June, will be fit to take up in July; for when these early plants are blanched five or six inches in length, you may begin to take them up; for if they were sown pretty early, they rarely continue long before they begin to pipe, and soon become useless.

But the plants of the main crop will not be blanched any considerable length till the middle or latter end of August, and beginning of September, but will not acquire their full perfection until October, as we before observed. However, where there is a demand for the plants, you may begin to take some up when they are whitened six or seven inches, as, if properly followed with earthing, they will be increasing every day in length in the blanched part.

In winter, at the approach of very severe frost, it would be of particular advantage to cover some of the rows of the main crop with dry long litter, to save the plants, and prevent the ground being frozen hard, that the plants may readily be dug up when wanted.

Likewise, at the approach of hard frost, a quantity of the plants may be taken up for the use of a family, and laid in some dry earth in a shed, or other sheltered place.

Another Method of Planting Celery in Trenches for Blanching.

There is a method of planting out the Upright Celery in trenches, but little known or practised in these parts; the manner of it is as follows:

Having fixed upon an open piece of ground, then with a line and spade cut or mark out a bed, or rather trench, six feet wide, cross-ways the ground; this done, begin at one end, and proceed to dig out a cavity the above width and length, one spade deep, laying the spits of earth to the right and left in a ridge along each side of the said cavity or trench, beating it up in front that it may not slip down; and when the trench is thus dug, loosen and level the bottom, and if dung is needful, let some be added, and dig it into the bottom four or five inches deep.

When more than one of such trenches are to be made, allow a clear space of six feet between trench and trench, to contain the earth dug out, and to have a sufficiency to land up the plants.

These trenches being prepared as above, then, having the plants and trimming them as before directed, proceed to plant them;

but observing they are here to be planted in rows cross-ways the trench, the rows to be a foot asunder, and the plants to be set six inches distant in each row, and giving water as advised in the other method.

When the plants are of due height for earthing up, the earth that was thrown out of the trenches is to be first used, then that of the spaces; break it fine, and with the spade trim it in carefully between the rows of plants, in equal portions from each side of the trench, landing them up a due height, which is to be occasionally repeated, observing the same rules as advised in earthing the plants.

In landing up the plants that are planted in the above method, it will be of advantage, when they have attained a large growth, to be furnished with a couple of thin boards, six feet long; these are to be used at the time of earthing, to slip into the spaces between the rows of plants, to keep the stalks and leaves up close just till the earth is put in, placing them close to the plants; then trim in the earth between the boards; and when one space is thus earthed, draw out the boards and place them in the next, and in that manner proceed in earthing the several rows in every such trench.

Culture of the Fourth Species; Turnep-rooted Celery.

The *Apium rapaceum*, or Turnep-rooted Celery, is esteemed principally for its root, which acquires a globular turnep-like form, and by culture becomes very white and tender, and is used for the same purposes as the Common Celery.

The leaves of this sort spread out somewhat horizontally, and rarely exceed ten or twelve inches in length, which, when blanched, may be used like the Upright Celery.

It is propagated by seeds, in an open rich spot, in March or April, sowing it as directed for the common sort, and when the plants are an inch or two high, thin them to three inches; and when they are four, five, or six inches in height, transplant them into shallow trenches; previous to which, dig the ground all over, one spade deep, then with an hoe draw drills three inches deep, and eighteen asunder, and set the plants therein six inches distance, and give water.

When the plants are advanced nine or ten inches in growth, observe the progress of the roots, and when they have acquired a tolerable size, draw earth up to each side of the row of plants, three or four inches high, which one earthing is sufficient to improve the roots, which will be fit to take up for use in a fortnight, or three or four weeks after.

Of

Of saving Seed of this Species.

When it is intended to save Celery seed, leave a few of the finest plants in the places where they were planted out for blanching; they will shoot up their flower-stems in May and June, flower in July, and ripen their seeds in August, when the stalks should be cut, and set in the sun a week to harden; then beat out the seed, and put it up in bags.

Fifth Species, the Smallage.

The *Apium graveolens*, or Smallage, is a common weed, bearing great resemblance to Celery, insomuch that the latter is by some supposed to be a variety of the former, raised to its present state of perfection by long culture; but I greatly doubt this, since both sorts retain their difference from seed.

This sort is used in medicine, but rarely for culinary purposes, except sometimes by poor country people to put in broth, or pottage, in default of other herbs.

It grows wild in moist places, and is seldom cultivated in gardens; but if wanted, it may be raised plentifully from seed in the spring.

APOCYNUM, Dog's-Bane.

This genus comprehends hardy herbaceous perennials, and tender shrubby exotics, all of the flowery tribe, attaining from two to five or six feet stature, adorned with simple leaves, and monopetalous bell-shaped flowers in clusters.

Class and order, Pentandria Digynia.

Characters.] CALYX is monophyllous, five-parted at the edge, and permanent. COROLLA is monopetalous, bell-shaped, and five-parted at the brim, and five oval nectariums at bottom. STAMINA, five filaments, and bifid antheræ. PISTILLUM, two germina, two small styles, and globular stigmas. PERICARPium, two capsules, containing many seeds.

The species most common are,

1. **APOCYNUM androsæmifolium.**

Tutsan-leaved Canada Apocynum.] Apocynum with upright herbaceous stalks, a yard high; large oval, smooth, stiff leaves, growing opposite by pairs, and the stalks crowned by cymose umbels of white flowers, having purplish nectariums.

2. **APOCYNUM cannabinum.**

Hemp Canada Dog's-Bane.] Apocynum with upright, herbaceous, reddish stalks, two feet high, oblong smooth leaves, set opposite by pairs, and the upper parts of the stalks terminated by greenish-white flowers in panicles. Of the stalks the American Indians prepare a sort of hemp.

3. **APOCYNUM venetum.**

Venetian Willow-leaved Apocynum.] Apocynum with erect herbaceous stalks, two feet

high, oval spear-shaped smooth leaves, placed opposite by pairs, and the top of the stalks adorned with large flowers, collected into bunches.

Varieties of this.] Venetian Apocynum with purple flowers—with white flowers.

4. **APOCYNUM frutescens.**

Shrubby Upright Ceylon Apocynum.] Apocynum with a shrubby, erect, branchy stem, attaining five feet in height, the branches adorned with oval-spear-shaped, smooth, shining leaves, set opposite by pairs; and flowers collected into small bunches, having an acute corolla, and hairy jaws.

Varieties.] Shrubby Apocynum with purple flowers—with yellow flowers.

5. **APOCYNUM reticulatum.**

Netted-leaved Climbing Indian Dog's-Bane.] Apocynum with a twining perennial stalk, climbing twenty or thirty feet high, oval, very much netted-veined leaves, by pairs opposite; and small bunches of flowers from the sides of the branches.

Varieties.] With purple flowers—greenish flowers—with white flowers.

For other species of Dog's-Bane, see ASCLEPIAS, PERIPLOCA, and CYNANCHUM.

The three first species are hardy herbaceous perennials; the roots are fibrous, and very creeping; the stalks rise annually from the root in spring, and perish in autumn; the leaves are simple, and pretty large, which, as well as the stalks, abound with a milky juice: the flowers are formed each of a single hollow, bell-shaped petal; those of the *Apocynum venetum* are considerably the largest and most beautiful: they all flower in July and August, but rarely perfect seeds in Britain.

These three sorts and their varieties are proper furniture for the common compartments of the pleasure-ground.

The propagation of these three species is easily effected by their creeping roots, in autumn or spring, either by dividing the main root, or by joints thereof.

The *Apocynum frutescens*, and Climbing Dog's-Bane, are tender exotics of the stove; the first has most claim to attention.

They may be propagated by seeds procured from abroad, and by cuttings and layers, either of which must be assisted by a hot-bed, and the plants are to be potted and always retained in the stove.

AQUATICÆ Plantæ, Aquatic Plants, i. e. such that grow in or near waters, either rivers, ponds, watery ditches, or other very marshy places.

AQUILEGIA, Columbine.

The plants are hardy, herbaceous, flowery perennials,

perennials, that attain from one to three feet stature, adorned at top with many pentapetalous-nectarious flowers.

Class and order, *Polyandria Pentagynia*.

Characters.] CALYX, none. COROLLA, five oval, spear-shaped, spreading petals, and alternately with these are ranged five hollow and horned nectariums, their lower part lengthened to a long incurved tube. STAMINA, numerous filaments, and erect antheræ. PISTILLUM, five oval germina, five subulate styles, and simple stigmas. PERICARPIUM, five erect cylindrical capsules, containing numerous oval shining seeds.

There are three species,

1. *AQUILEGIA vulgaris*.

Common Columbine.] *Aquilegia* with upright stems, a yard high, dividing into many erect branches, leaves composed of many lobes, growing by threes, and all the branches terminated by the flowers, which have incurved nectaria.

Varieties of this are numerous, and singularly curious, which are,

Common Columbine with flowers composed of five petals, ranged alternately with five nectaria, as expressed in the characters.

Common Columbine with flowers composed of double petals, and nectaria ranged alternately.

Common Columbine with flowers, having no visible nectaria, and composed principally of oval petals, of which there are single and very double flowers; commonly called Rose Columbines.

Common Columbine, having no visible nectaria, and composed principally of sharp-pointed petals, expanding like a star, of which there are single and perfectly double flowers, commonly called Starry Columbine.

Common Columbine, with flowers having no petals, being composed entirely of nectaria, of which there are single, double, and trebly double flowers, having many nectaria, placed one within another, in a curious manner.

Common Columbine with inverted flowers.

Of each of the above varieties, there are blue flowers—white flowers—red flowers—purple flowers—flesh-coloured flowers—ash-coloured flowers—chestnut-coloured flowers.

—Of variegated kinds there are, blue and purple flowers—blue and white flowers—with red and white flowers—blue and white flowers—with finely-striped flowers—with flowers having one part plain or one-coloured, the other curiously striped and spotted with different colours.

2. *AQUILEGIA alpina*.

Mountain Columbine.] *Aquilegia* with upright slender stems, two feet high, dividing into many slender erect branches, many-parted leaves, and large single blue flowers terminate the branches, and with erect nectaria, and short spear-shaped petals.

This grows wild in many places in woods and hilly grounds.

3. *AQUILEGIA canadensis*.

Canada Dwarf Early Columbine.] *Aquilegia* with upright stalks, a foot high, dividing into slender erect branches, each terminated by a single flower, with the petals red without and yellow within; straight nectaria, and the stamina longer than the corolla.

All these species and respective varieties are hardy herbaceous perennials; the roots are fibrous, and the leaves and flower-stems rise annually from the root in spring; the leaves are branching, and composed of many lobes, growing generally by threes; the stems divide into many branches, each terminated by the flowers, which are large, numerous, and very showy, appearing in April, May, and June, and ripen seeds plentifully in August and September.

The *Aquilegia vulgaris*, or common Columbine, and all its varieties, are choice furniture for pleasure-grounds of any extent, their flowers being large and numerous, and assuming many curious structures, forms, sizes, colours, and variegations, as to be extremely conspicuous and ornamental in a garden, and those of all the double variegated and striped kinds particularly have singular elegance; and in short, all the varieties are capable of forming a most agreeable diversity, and they prosper freely in any common soil and exposure, but make the finest appearance in an open situation.

It is remarkable that all the different varieties of this species, in regard to structure, form, size, colour, and variegations of the flowers, are often obtained from the seed of the same plant.

All the varieties of this species flower in the end of May and in June.

The *Aquilegia alpina* has no striking beauty, but the flowers being large, will form a variety in the common borders in May and June.

The Canada Columbine merits culture principally for its early bloom, which generally appears in April.

Propagation, Culture, &c.

First of the *Aquilegia vulgaris*. All the varieties of this sort may be raised plentifully from seed, and by dividing their roots.

The seed may be sown either in autumn or

or spring, in a bed or border of common light earth; dig the ground neatly one spade deep, sow the seed moderately thick either on the surface, and rake it in, or in drills; and the plants will appear in April or May, giving occasional water and weeding until June, July, or August, according to their size; then prick them out upon another bed in rows nine inches distance, and give occasional watering during the hot weather. Next summer the plants will flower, but not strong; when the best kinds should be marked, in order to be removed in autumn into the most conspicuous compartments, where they will flower strong, and in their utmost perfection, the year following, and continue several years.

In order to keep up a succession of fine flowers, a supply of plants should be raised from seed every two or three years, because the old plants discover a degeneracy, that often, from the fullest doubles, and elegant variegations, become single, and of plain colours.

By parting the roots, any variety may be increased; but this should be performed always upon the young plants of two or three years old, which may be done in autumn or spring.

In saving seed of this species, gather it always from the plants that exhibit the finest flowers.

The other two species, Mountain and Canada Columbines, are to be propagated in the same manner as the garden kinds.

All the culture necessary for the several kinds, is to keep them clean from weeds in common with other plants, and to cut down their decayed stems in autumn.

ARALIA, Berry-bearing Angelica, and Angelica-Tree.

This genus comprehends two herbaceous perennials, and one woody plant, of the tree kind.

Class and order, *Pentandria Pentagynia*.

Characters.] **CALYX**, globular umbel of flowers, having a small involucre, and very small cup to the florets, resting on the germen. **COROLLA**, the florets of the umbel have five oval petals. **STAMINA**, five filaments, and roundish antheræ. **PISTILLUM**, a roundish germen below the calyx, five short styles, and simple stigmas. **PERICARPUM**, a roundish striated berry, containing five seeds.

The species are,

1. *ARALIA racemosa*.

Ramose-leaved Herbaceous Canada Aralia.] Aralia with an upright, smooth, branching, leafy stem, attaining three or four feet stature, adorned with large ramose leaves, composed of many oval serrated lobes, and flower-peduncles rising from the axillas of the leaves, terminated by round umbels of whitish flowers.

2. *ARALIA nudicaulis*.

Naked-stalked Herbaceous Virginia Aralia.] Aralia with a short, upright, naked, or leafless stem, large decompound leaves, of two or three divisions, each division composed of five serrated lobes, rising directly from the root, and, between them, the flower-stalks crowned by round umbels of whitish flowers.

3. *ARALIA spinosa*.

Thorny Tree-like Virginia Aralia, or Angelica-Tree.] Aralia with a tree-like branching stem, growing ten or twelve feet high, defended by strong spines, large, long, decompound, spinous leaves, composed of many wings, each wing of many oblong lobes, and large, loose, greenish-yellow umbels of flowers terminate all the branches.

All these plants are natives of America, but grow freely here in the full ground.

The appellation of Angelica given to these plants, is from their similarity of growth, and the young leaves forming a cluster at the ends of the stem and branches, like those on the same parts of the Common Angelica.

The *Aralia racemosa* and *nudicaulis* are herbaceous perennials; the roots are fibrous, and creep considerably, and the stalks rise annually from the root, produce their large umbels of flowers in June and July, and are succeeded by plenty of seed in clusters of small black berries, ripe in September and October.

These two species assuming a large branching majestic growth, are proper furniture for the compartments of large shrubberies, and to embellish those of wilderness works, and the borders of wood-walks, &c.

Their propagation is by seed, and by dividing their roots.

The seed, if sown in autumn, in a bed of light earth, will rise freely in the spring, and in autumn transplant the plants where they are to remain.

By roots they increase exceedingly, which may be parted in autumn when the leaves decay.

The *Aralia spinosa*, or Angelica-Tree, is deciduous in leaf. It is a plant of singular appearance in summer, when clothed with its large, long, doubly branching, many-lobed leaves, and claims a place in the most conspicuous parts of the shrubbery.

It flowers in August, but rarely perfects seed in England.

The propagation of this species is by seed, and by planting pieces of its horizontal roots.

The seed is procured from America. Sow it as soon as it arrives, in spring, in pots of light earth, and cover it half an inch deep, and if they are plunged in a moderate hot-bed, it will facilitate their germination; but

in default of this, plunge the pots in a dry warm border, give occasional light waterings and shade in hot sunny days, and probably the plants will appear in May or June; but if this is not effected by June, move the pots under a shady hedge or wall for the remainder of the summer, and in October place them in a garden frame, to have occasional shelter from frost during winter, in which let them remain until March; then plunge them in a warm border, and if the plants did not come up before, they will now appear, giving water occasionally, and remove the pots to the shade in summer, and into a frame again in winter, to continue until the latter end of March; then transplant them, some separately into small pots, others into a bed of light earth, in a sheltered situation in the nursery: those planted in the pots are designed to be moved to shelter in winter, because the seedling plants are tender the first two or three years; some shelter should also be bestowed the first winter upon those in the full ground, when the frost is very severe.

When these plants are three or four years old, or two or three feet high, they may be transplanted into the shrubbery.

To propagate them by roots, cut off pieces of the horizontal ones in spring, and plant them in pots, which plunge in a hot-bed, and they will send out fibres below, and shoots above.

Likewise, by separating some of the roots from the plant in spring, permitting them to remain in the ground, they will also send up several shoots or stems.

ARBOR, a Tree. A perennial plant, rising with a simple woody, and durable stem or trunk, to a great height and substance.

This definition of a tree is principally the substance of what naturalists advance to distinguish a tree from a shrub, which is supposed to be of lesser growth, and for the general part to have several stems; and from herbaceous plants, whose stems are soft, often succulent, and mostly rise in spring, and perish in autumn, though this is not general.

But in regard to the distinction between trees and shrubs, it is not universally obvious. Nature, says Linnæus, has put no limits betwixt trees and shrubs; for to say that trees are taller than shrubs, is in effect saying nothing, unless a certain fixed immutable standard were previously established. Besides, every thing respecting dimensions is so variable in its nature, and depends so much upon difference of climate, soil, and culture, that no certain standard or boundary can with propriety be fixed between trees and shrubs, since the same plant, in different countries, often assumes

very different growths; thus the *Arbutus*, and Laurel, in warm climates, grow to large trees; in this country they are generally considered as shrubs.

The only definition therefore that can be made, is, that, for distinction sake, shrubs may be considered as such, which either rise with several stems from the root, or that the main stem divides near the root into several smaller ones. See **FRUTEX**, a *Shrub*.

ARBOURS.

These are compartments in gardens formed with various sorts of trees and shrubs, in such order as to inclose a certain space, to form a kind of recess and shady retreat from the walks, in the heat of summer.

They were in great repute formerly, and were commonly formed of ever-greens, very often of yews, planted very close, the sides trained erect, six, eight, or ten feet high, and the top formed like a vault, or trained archways, over an arched frame or lattice-work, of wood or iron, and arched openings or arcades were generally formed on the sides, and the whole was shorn or clipped annually, to keep them in due order, which often appeared very ornamental, according to the ancient style of gardening.

These kind of Arbours were also often formed of deciduous trees, particularly the elm, and sometimes with hornbeam, beech, and limes, which were constantly shorn every summer.

The figure of these Arbours, both of the ever-green and deciduous kinds, was either square, hexagonal, octagonal, or round; and their dimensions generally from ten to fifteen feet in width and height; the tops were formed either pavilion, turret, or dome fashion, and sometimes terminated by a globe, pyramid, or other figure, formed of the extreme branches.

Covered Arbours or Bowers may be formed very quickly, even in one season, with several sorts of shrubby and herbaceous climbers, some of which will advance fifteen or twenty feet in one summer. See **CLIMBING PLANTS**.

When it is designed to form an Arbour, it should, if possible, be erected upon a somewhat rising ground, for the greater advantage of free air, and to enjoy the prospect of the garden and adjacent country.

An Arbour is sometimes formed in the head of a single large tree, particularly the elm, where the trunk has divided at the height of ten or twelve feet, into several lesser spreading stems, to admit of erecting a small platform between, cutting down the large boughs, and training the pliable branches archways over lattice-work, till those of each side meet; then.

then clip the sides annually, and the top may either be cut, or permitted to grow up; or the whole suffered to advance in a natural growth.

Rural Arbours are sometimes formed thus: plant some of the tallest-growing flowering shrubs round the inside, to form the dimensions of the Arbour; then, on the outside of these, plant others of somewhat lesser growth; so continue three or four ranges, diminishing gradually in stature from the Arbour outward, permitting the whole to take their natural growth; so that at a distance it will assume the appearance of one of the common shrubbery clumps.

The bottom of Arbours should be gravelled, and garden-chairs placed there in summer, which should always be housed in winter.

ARBUTUS, the Strawberry-Tree.

This genus furnishes most beautiful ever-green shrubs for the shrubbery, remarkable for producing fine clusters of scarlet fruit, like strawberries, hence they derive the appellation Strawberry-Tree.

Class and order, *Decandria Monogynia*.

Characters.] CALYX is small, five-parted, permanent, and placed under the germen. COROLLA, a single pitcher-shaped petal, five-parted, and revolute at the brim. STAMINA, ten short filaments, and bifid antheræ. PISTILLUM, a globular germen, cylindric style, and thick obtuse stigma. PERICARPIUM, a roundish berry of five cells, containing small hard seeds.

The species of most note are,

1. ARBUTUS *Unedo*.

Common Arbutus, or Strawberry-Tree.] Arbutus with an erect tree-like woody stem, oblong-oval smooth leaves, sawed on the edges, and large oval berries having many seeds.

Varieties of this are,] Common Arbutus with large oval fruit.—Common Arbutus with round fruit.—Double-blossomed Common Arbutus.—Scarlet-flowering Common Arbutus.

2. ARBUTUS *Andrachne*.

Oriental Broad-leaved Arbutus.] Arbutus with an erect tree-like woody stem; oblong-oval, smooth leaves, having entire edges; and large oval berries having many seeds.

3. ARBUTUS *Uva Ursi*.

Bear-berry, or Dwarf trailing Arbutus.] Arbutus with shrubby, very branchy procumbent stalks, about two feet long; oval, thick, smooth, entire leaves; greenish-white flowers in clusters at the end of the branches, and small roundish berries.

Varieties.] *Uva Ursi* with black berries.—*Uva Ursi* with red berries.

All the above species and respective varieties are hardy exotic ever-greens; the two

former are of a tree-like growth, and the other is a dwarfish shrubby plant. They all prosper in any common soil of a garden.

They are all closely adorned the year round with simple leaves, and produce flowers and fruit in small loose clusters.

The Common Arbutus and varieties are some of the most elegant ever-greens of our shrubberies; they are natives of Spain, Italy, and some parts of Ireland, where they attain twenty or thirty feet stature, with trunks of considerable substance, and spreading heads.

These varieties, in this country, often grow twelve or fifteen feet high, assuming full and regular heads, and all the young shoots a fine red colour, the whole closely adorned with moderate-sized, oblong, sawed leaves, placed alternate, and the trees are fully garnished with them at all seasons, and produce whitish flowers in numerous small clusters annually in October and November, succeeded by abundance of strawberry-like fruit; but these do not attain maturity in less than twelve months, when they assume a scarlet colour; so that those of each year's bloom ripen next year in November, by which means there are annually flowers, and ripe fruit upon the trees at the same time; which, together with their numerous leaves on red foot-stalks, effects one of the most singularly beautiful contrasts in nature.

The oval and round-fruited varieties are the sorts most commonly cultivated, the former of which rather attains the largest growth, and produces the largest flowers and fruit.

The double-blossomed kind having only two series of petals; its doubleness is not very conspicuous.

The scarlet kind, when in bloom, forms a pretty diversity, in assemblage with the other varieties.

The *Andrachne*, or Oriental Arbutus, assumes a larger growth than any of the preceding sorts, and branches out irregularly; the leaves are larger, and with the edges entire; but it produces flowers and fruit like the Common Arbutus, but not so abundant.

This sort having fine large leaves, makes a noble appearance at all seasons.

The flowers of all these species and varieties are produced in small loose clusters; each separate flower is small, and formed universally of a single hollow petal, bellied below, pitcher-fashion; the whole, except the scarlet kind, assumes a greenish-white colour, and the fruit succeeds the flowers in clusters.

The fruit, in the two tree-kinds, are berries, in shape, size, and colour, resembling large scarlet strawberries, though generally much larger, and grow three, four, five, or more in

clusters, remarkably beautiful to appearance, but unpalatable to eat.

The *Uva Ursi* is a small bushy shrub, a native of the mountainous parts of the continent of Europe, and is retained in many gardens for the sake of variety.

Use in Gardens, Propagation, &c.

All the varieties of the Common Arbutus and *Arbutus Andrachne*, are some of the finest ever-greens that can be seen, and are well adapted to occupy the most conspicuous places in shrubberies, either in assemblage towards the fronts of clumps, or to be placed detached on grass ground, or some in pots.

In whatever mode of planting it is designed to employ them, place them so much detached as to appear conspicuous at all times, and permit them to take their own natural growth.

The best season for transplanting all the sorts, is the end of September, October, and beginning of November, or in March and April.

The propagation of all the species is effected most commonly by seed; they will also sometimes grow by layers and cuttings, though the latter rather more reluctantly; but the seed grows freely, from which the handsomest plants are obtained. Observe, however, that, to continue the double-blossomed and scarlet kinds with certainty, it must be effected either by layers, cuttings, grafting, or inarching; for these varieties will not retain their difference from seed.

From the seed of either the common oval or round fruited kinds, some of both sorts may be expected; that of the former is rather to be preferred for sowing.

The berries containing the seed may be had of the nurserymen and seedsmen in October, November, and Spring; and the seed may either be sown in pots in autumn, and sheltered in a frame all winter, or may be preserved in dry sand until March, and then sown in pots of light earth, and covered about a quarter of an inch deep; then, if the pots are plunged in a hot-bed, it will so greatly forward the germination of the seed that the plants will rise in a month or six weeks, when they must have plenty of air admitted, moderate waterings, and inured by degrees to the full air in summer, when the pots should be plunged in the common ground until October, and then placed in a green-house or frame, to have shelter from frost, till March: at which time it is advisable to transplant the seedlings singly in small pots, which, if directly plunged into a slender hot-bed, shielded and shaded occasionally with mats, giving moderate waterings, they will quickly take root and set to growing, when the pots may be plunged in a bed of common

earth in a sheltered place, to remain two or three years, indulging the plants with larger pots, and protection from severe frost, till they are two or three feet high; then transplant them, with the balls of earth about their roots, into the full ground.

To propagate them by layers, it must be performed on the young shoots, otherwise they rarely emit roots in less than two years.

Cuttings will emit roots by the aid of heat. Plant a number of the short young shoots in pots, in spring or summer, and plunge them in a substantial hot-bed of tan or dung.

Inarching or grafting them is performed in the usual way, upon stocks of any of the varieties.

ARCTOTIS.

This genus consists of shrubby perennials and herbaceous plants of tall and low-spreading growth: all very floriferous, compound-flowered exotics, for the green-house.

Class and order, *Syngenesia Polygamia Necessaria*.

Characters.] CALYX is a round, imbricated, scaly cup. COROLLA is compound and radiated; the middle composed of numerous male, funnel-shaped, five-parted, reflexed florets, and many long, flat, female florets compose the border or radius. STAMINA, in each male floret, are five filaments, having short antheræ. PISTILLUM, in the female florets, a trigonous downy germen, simple style, and two oval stigmas. PERICARPIUM none, and a single seed in each female floret.

The species of most note are,

1. *ARCTOTIS aspera.*

Rough-leaved golden Arctotis.] Arctotis with an upright, branching stalk; oblong, deeply-sinuated-winged-like, hairy leaves; the segments oblong and indented, and large golden yellow flowers, having a fertile radius.

2. *ARCTOTIS plantaginea.*

Plantain-leaved Arctotis.] Arctotis with an upright, branching stalk; ovate spear-shaped, indented, nervous, running leaves, embracing the stalk; and large golden-yellow flowers, having a fertile radius.

3. *ARCTOTIS angustifolia.*

Narrow-leaved Arctotis.] Arctotis with spreading branching stalks; narrow, lyrate-oblong, stiff leaves, indented on the sides, and pale-yellow flowers, having a fertile radius.

4. *ARCTOTIS calendulacea.*

Marigold-flowered Arctotis.] Arctotis with spreading branching stalks; oblong, runcinated indented leaves, and large sulphur-coloured flowers, having a sterile radius.

5. *ARCTOTIS acaulis.*

Stalkless

Stalkless Dwarf Arctotis.] *Arctotis* without stalk, lyre-shaped, sinuated leaves from the root, the foot-stalks of the flowers rise between the leaves, supporting large golden flowers.

The first three species have perennial stems, which in some grow three or four feet high, and divide into many luxuriant tender branches, terminated by large, compound, radiated, yellow flowers, appearing in summer, and often continue in succession during autumn and winter, and make a pretty appearance.

The *Arctotis acaulis* is a low plant, the flower-stalks rarely exceed six inches in height, but support fine large radiated flowers in April or May, and often afford ripe seeds.

They are all exotics of Africa, and require the protection of a green-house in winter, so must always be kept in pots.

The propagation of the shrubby sorts is easily effected by cuttings of the branches or shoots any time the beginning of summer, either in pots, or a bed of light earth, giving occasional shade and water, and they will be rooted in six or eight weeks, when they should be planted in separate small pots, and managed as other green-house plants.

The other sorts may be raised from seed in spring, and by slips from the roots.

ARDUINA, Cape Buckthorn.

Consists of an ever-green shrub for the green-house, with ovate leaves, and funnel-shaped flowers.

Class and order, *Pentandria Monogynia.*

Characters.] *CALYX*, a small five-parted erect cup. *COROLLA*, monopetalous and funnel-shaped cylindric tube, and five-parted acute spreading border. *STAMINA*, five single filaments, with oblong antheræ. *PISTILLUM*, a superior, ovate germen, slender style, and bifid thick stigma. *PERICARPIUM*, a globose oval berry, with two cells, each containing an oblong hard seed.

The species is,

ARDUINA, hispidosa.

Two-spined Arduina.] Rises with a shrubby branching stem, four or five feet high, armed with twin prickles, and garnished with ovate pointed leaves, near an inch long, and placed opposite. The flowers, which are small and white, come out at the ends of the branches great part of the summer, and are succeeded by two-celled scarlet berries, each containing two hard seeds.

This is an elegant shrub, and must be always kept in pots of good earth, in order for removing into the green-house, and managed the same as other shrubby plants.

The propagation is by cuttings, assisted by

a hot-bed, or by layers of the young shoots in summer, which when well rooted may be potted off into single pots.

ARECA, Fausel-Nut Palm.

Comprising the Cabbage-tree, a remarkable tall growing West-Indian exotic, of the palm tribe, retained in our stoves for variety.

Class and order, *Monœcia Enneandria.*

Characters.] Male and female flowers on the same plant. *CALYX* of the male, a two-valved sheath, branching spadix, with the proper cup three-leaved. *COROLLA*, three rigid, pointed petals. *STAMINA*, nine filaments, the three outward ones longer than the others. The female flowers have a common sheath as the males, with a triphyllous perianthium. *COROLLA*, three petals, as the male. *PISTILLUM*, an oval germen, awl-shaped style and trifid stigma. *PERICARPIUM*, an oval fibrose berry, imbricated round the base of the cup, containing oval seeds.

This plant grows in the West-Indies to the amazing height of above eighty feet, the younger leaves at top, growing compact, as a cabbage, whence the vulgar name. These are eaten by the inhabitants, and frequently pickled, but when once cut the tree totally decays.

The species is,

ARECA oléaracea.

Cabbage-tree.] Rises with an unbranched stem to a great height, smooth, and of about a foot diameter at the lower part, garnished at the top with leaves twelve or fourteen feet long, having longitudinal furrows, ending in acute points, and placed alternately; these naturally fall off as the tree advances in growth, leaving the marks where they have grown; the flowers come out below the leaves in loose bunches, and are succeeded by yellowish berries.

It is kept in our stoves more for curiosity of its singular foliage, than with a view to produce fruit. The propagation is by seeds, as the palm. See *PHŒNIX*.

ARGEMONE, Prickly Poppy.

This genus consists of one species, which is annual.

Class and order, *Polyandria Monogynia.*

Characters.] *CALYX*, a three-leaved roundish perianthium. *COROLLA*, consists of six large round erect spreading petals. *STAMINA*, numerous thread-shaped filaments, and oblong erect antheræ. *PISTILLUM*, a five-angled oval germen, no style, but the germen crowned with a broad, obtuse, reflexed stigma. *PERICARPIUM*, an oval six-angled capsule, of one cell, containing many small seeds.

The species is,

ARGEMONE mexicana.

Mexican.

Mexican Prickly Poppy.] Rises with an upright stem, two feet high, garnished with white veined leaves beset with yellow prickles; the flowers are of a bright yellow terminating the branches, which are succeeded by round six-angled capsules, filled with small seeds.

This plant being an annual, is raised by sowing the seed in the spring, in the common ground, where the plants may remain to perfect themselves.

ARISTA, the awn, or sharp beard or point issuing from the husk or scaly flower-cup of the grasses, as that of the common barley and other corn.

ARISTOLOCHIA, Birthwort.

This genus comprehends herbaceous perennial exotics of the common ground and green-house, adorned with heart-shaped leaves, and monopetalous tubular flowers, retained in our gardens for variety, and are also esteemed for their eminent virtues in medicine, and are accounted sovereign in child-birth, as the name imports.

Class and order, *Gynandria Hexandria*.

Characters.] CALYX, none. COROLLA is monopetalous, tubular, and irregular, the base is globular, and is extended above into a cylindrical tube spreading at the brim, where the lower part is stretched out like a tongue. STAMINA, no filaments, but six antheræ joined to the under part of the stigma. PISTILLUM, an oblong triangular germen under the corolla, no style, but a roundish six-parted stigma. PERICARPIUM, a large oblong capsule of six cells, filled with depressed seeds.

The species that demand attention are the following.

The first four are hardy, herbaceous perennial-rooted plants, with annual stalks.

1. ARISTOLOCHIA *rotunda*.

Round-rooted Trailing Birthwort.] Aristolochia with a roundish root, infirm trailing stalks two feet long, heart-shaped roundish leaves; sitting close; and blackish-purple solitary flowers.

2. ARISTOLOCHIA *longa*.

Long-rooted Trailing Birthwort.] Aristolochia with a long carrot-shaped root; infirm trailing stalks, eighteen inches long; heart-shaped blunt leaves, having foot-stalks; and purplish solitary flowers.

3. ARISTOLOCHIA *Serpentaria*.

Virginia Snake-root.] Aristolochia with infirm, flexible, procumbent stalks, a foot and half long; heart-shaped, oblong, plane leaves; and recurved, reddish, solitary flowers.

4. ARISTOLOCHIA *clematidis*.

Common Upright Birthwort.] Aristolochia

with very creeping roots; erect firm stalks, eighteen inches high; heart-shaped leaves, having long foot-stalks; and pale-yellow flowers in clusters.

The three following are perennial-stalked exotics of the green-house.

5. ARISTOLOCHIA *sempervirens*.

Ever-green Trailing Birthwort of Crete.] Aristolochia with infirm, angular, trailing stalks, eighteen inches long; heart-formed, oblong, waved leaves; and long, recurved, dark purple, and solitary flowers.

6. ARISTOLOCHIA *Pistolochia*.

Small Ramose-stalked Birthwort.] Aristolochia with infirm branching stalks, heart-shaped slightly crenated leaves, having foot-stalks, and solitary flowers.

7. ARISTOLOCHIA *arborescens*.

Shrubby Upright Virginia Birthwort.] Aristolochia with strubby erect stalks, two feet high; heart-formed spear-shaped leaves, and solitary flowers.

The four first species are hardy, have perennial roots, but the stalks are renewed annually in spring; which, of the first, second, and third sorts, if not supported, prostrate themselves upon the ground; but the *Aristolochia clematidis* stands erect: all of which are adorned with the leaves in alternate order, and flowers proceeding from the sides of the stalks at the angles of the leaves, in June and July, succeeded by ripe seed in autumn.

For purposes in gardens, these four sorts are considered chiefly as plants of variety, or for observation, for as flowering plants they cut no great figure.

As medical plants they are possessed of eminent virtues, being very salutary in many disorders, particularly the roots of the *Aristolochia rotunda* and *Aristolochia longa*, which are also remarkable for their drawing properties, insomuch that a poultice of them will extract thorns or splinters from the flesh in any part of the body; and the root of the *Serpentaria* is said to be a cure for the bite of the rattle-snake of America, and all other noxious serpents and venomous animals: these, as well as the others, are efficacious in many other cases. They are imported from abroad to supply the shops, for they are not cultivated here in sufficient quantity for general use, though from seed a few plants may be easily obtained in our gardens.

The Ever-green *Aristolochia*, the *Pistolochia*, and Shrubby Virginia Birthwort, are small exotic perennials of the green-house, durable in root and stalks; the two former, being of very infirm and flexible growth, require support; but the stalks of the other, being more shrubby

shrubby and firm, support themselves erect; all of which produce flowers singly from the axillæ of the leaves in summer, but rarely any seed in England.

Propagation.

The propagation of the three first sorts is by seed sown in autumn, soon after they are ripe, i. e. in September or October, in pots of light earth, which must be placed in a garden-frame to have occasional protection from frost, and in spring the plants will appear; but if the pots are plunged in a moderate hot-bed in March, it will forward them exceedingly, observing to inure them by degrees to the full air, giving water during summer, and shelter of a frame in winter, and next spring transplant them, some into a warm border, and some in small pots, to have another winter's occasional shelter, which, in spring after, may also be turned out into the common ground.

The *Aristolochia clematitis* multiplies exceedingly by its creeping roots, by which it may be increased at almost any season.

The green-house kinds may be propagated by seeds procured from abroad, and sown in pots of light earth, and plunged in a hot-bed in March; they may also be increased by slips of the roots in spring, likewise by cuttings, particularly the Shrubby Birthwort; all of which, after being raised in spring and summer, must be potted in autumn, and housed every winter.

ARMA, Arms, Armature, or Offensive Weapon, or Armour of Plants, intended by nature, say naturalists, to keep off naked animals that would approach to hurt them.

There are different species of armour with which plants are furnished, and are by botanists called, *Aculei*, prickles, such as those of the rose and raspberry, &c. *Spina*, spine, or thorns, as the hawthorn, buckthorn, false acacia, &c. *Furcæ*, forks, species of prickles, consisting of two or three prongs, as berberry, fig-marigold, &c. *Stimuli*, stings, as nettle, &c. See ACULEUS, SPINA, FURCÆ, and STIMULI.

ARNICA, Leopard's-bane.

A genus of herbaceous plants, with compound radiated flowers.

Class and Order, *Syngenesia Polygamia superflua*.

Characters.] CALYX, an imbricated cup, shorter than the rays of the corolla. The compound flower is radiated, the disc hath many hermaphrodite florets, each consisting of one tubulous petal, cut at the brim in three unequal segments, and the rays consist of very long open spear-shaped florets; there is no pericarpium, but the cup, which is permanent,

contains an oblong seed crowned with a long slender down.

The species are,

1. ARNICA *montana*.

Mountain Arnica.] Hath oval entire leaves, and those on the stalks growing opposite by pairs.

2. ARNICA *scorpioides*.

Scorpion-rooted Arnica.] Hath sawed leaves growing alternately.

Both these species are hardy, and add to the flower-garden collection; they delight in a moist shady situation, and are propagated by parting their roots in autumn, or sowing the seeds as soon as they are ripe.

It is reported that they contain powerful medicinal virtues against the bites of venomous animals.

Other Leopard's-bane. See DORONICUM.

AROMATICÆ *Plantæ*.

Aromatic Plants.] Such as possess a fragrant aromatic flavour, generally of a strong agreeable odoriferous smell and taste; and of which are many of the requisite plants of the kitchen-garden, employed principally, in the greater part, as very salutiferous savoury sweet herbs, in various culinary occasions, and some for family medical purposes and other domestic uses, consisting chiefly of the following sorts; species of several different genera, collected under this head in one point of view, shewing at once the principal sorts proper to cultivate as garden aromatics.

They consist of under-shrubby and herbaceous perennials, of several years' duration; and of annuals and biennials of but one and two years' continuance, requiring to be raised every year from seed.

Under-shrubby and herbaceous perennial kinds, of several years' duration.

Thyme (*Thymus*).

Sage (*Salvia*).

Winter Savory (*Satureja*).

Pot-marjoram (*Origanum*).

Winter Sweet-marjoram (*Origanum*).

Hyssop (*Hyssopus*).

Mint (*Mentha*).

Penny-royal (*Mentha*).

Balm (*Melissa*).

Fennel (*Anethum*).

Tansy (*Tanacetum*).

Tarragon (*Artemisia*).

Chamomile (*Anthemis*).

Peppermint (*Mentha*).

Lovage (*Ligusticum*).

Rue (*Ruta*).

Rosemary (*Rosmarinus*).

Lavender (*Lavendula*).

Of the above perennial aromatics, the first six

six and last three sorts are principally under-shrubby and shrubby kinds, with abiding tops, continuing furnished with leaves mostly the year round; the others are all herbaceous, renew their stalks, &c. every spring and summer.

Annual and biennial kinds, of but one and two seasons' duration, raised every year from seed.

Sweet-marjoram (*Origanum*).

Summer Savory (*Satureja*).

Chervil (*Scandix*).

Dill (*Anethum*).

Marigold (*Calendula*).

Basil (*Ocimum*).

Parsley (*Apium*), biennial.

Caraway (*Carum*).

Anise (*Pimpinella*).

Angelica (*Angelica*), biennial-perennial.

These being the principal aromatics for common domestic occasions, are proper for culture in every kitchen garden, more or less, according to the demand, either for private use or public supply; the greater part chiefly as sweet pot-herbs for various culinary purposes in cookery; some in fallads, &c. and others principally to use occasionally in medical and some other domestic purposes in a family.

In the perennial kinds, the principal culinary or pot-herb aromatics, are the thyme, sage, winter-savory, marjorams, mint, penny-royal, tansey, tarragon and fennel: the others in this class are not used as kitchen or culinary aromatics, but mostly for other domestic occasions, such as the hyssop, balm, chamomile-flowers, lovage, rue, rosemary, chiefly for some simple medical purposes in a family; the peppermint for distilling, also the lovage and penny-royal occasionally for the same purpose; and the lavender for its flowers, both to distil for lavender water, and to lay among cloaths to give them a sweet scent. Some sorts of sage, common mint, and balm, are also esteemed to use occasionally by way of tea; and young green mint and tarragon also in spring fallads.

And in the annual and biennial aromatics, the sweet-marjoram, summer-savory, chervil, dill, marigold, basil, parsley, and coriander, are the principal sorts to cultivate as culinary aromatic herbs for different kitchen uses, &c. the caraway and anise are cultivated occasionally, chiefly for their seeds both to use in the kitchen, and for distilling; also sometimes the coriander-seed, but more generally the two former; and the angelica, principally for the young tender shoots of its stalks to use in confectionary, to candy as a vegetable sweet-meat, and the seeds for medicine; some of these annual aromatics are also sometimes used to give

flavour to fallads, such as chervil, coriander, and basil, &c. the young leaves, in small quantities, to mix with some principal fallad herbs. [See the different sorts under their respective genera.]

As the general descriptions, methods of propagation and culture, &c. of all the above aromatics, are fully explained, each under its proper genus, shall not enter particularly upon it in this place; but as being principal family herbs, generally known under the appellation of aromatic plants, it was thought eligible to give a list of the different species and their principal respective uses, under this head, shewing at once the sorts proper to cultivate as garden aromatics for furnishing the herbary; with some general observations collectively.

They are mostly all of hardy growth, except the basil, to succeed in any common soil and situation.

The perennial sorts continue of several years' duration in the same plants, in which some being durable, both in root and top, remain green for use all the year, such as thyme, sage, winter-savory, marjoram, hyssop, rue, rosemary, &c.; the others being perennial only in root, and annual in stalk, such as the mints, penny-royal, tansey, tarragon, fennel, chamomile, &c. furnish their respective produce for use only in spring, summer, and autumn, and all of which perennial aromatics are easily raised either by slips, off-sets, parting the roots, or also by seed, and may be planted, &c. in spring, summer, or autumn, in beds or borders, six to ten or twelve inches asunder.

But the annual and biennial kinds, continuing in the former only one season, and the latter only till the second year, must be raised every year from seed in the spring, in any compartment of common earth in the full ground, except the basil, which being tender, must be raised in a hot-bed for transplanting in May or June, but most of the others are generally to remain where sown in the natural ground; or you may occasionally transplant some of the sweet-marjoram and summer-savory in June, &c. and the angelica in particular, being of large growth, should generally be sown in any bed or border for transplanting in summer.

For their general uses, some of the perennial sorts continuing green all the year, furnish supplies mostly at all seasons; as thyme, sage, winter-savory, &c. but others only in spring and summer, and of which, in some sorts, should generally gather a proper quantity in July or August, to dry and house for winter service, such as mint, balm, penny-royal,

royal; tarragon, sweet marjoram, &c. also marigold and chamomile flowers, and those of lavender; or likewise some sage tops, marjoram, hyssop, and the like, to dry and house in autumn, to be ready in case of a severe winter; parsley generally furnishes proper supplies of green leaves all the year; basil and dill only in summer; chervil and coriander, principally in summer and autumn, of the spring and summer sowing; or if some are also sown in August, they will continue green all winter, but the coriander will require some protection in that season; and the caraway, anise, and angelica, continue only in summer and autumn.

As to general culture, the perennial sorts, being planted in beds or borders, continue several years' duration; they only require keeping clean from weeds all summer, and in autumn to cut down the decayed stalks, &c. and in that season, and in the spring, to give the beds, &c. a neat dressing, by clearing off all weeds and litter, and then loosen the ground a little between the plants; or in some close running kinds, as mint, &c. spread some earth thinly over the general surface; and when, in process of time, any particular sorts appear in a declining state, make a fresh plantation in the proper season. And as to the annual sorts, keep them clear from weeds during their growth, and continuance, which is all they require, and to raise succession supplies every year from seed. See their respective genera.

ARTEMISIA, Mugwort, comprehending also the species of *Absinthium*, or Wormwood, and *Abrotanum*, the Southernwood.

This genus is very comprehensive, and retains both herbaceous perennials and shrubby plants of the common ground and greenhouse, for medical use and variety in gardens, adorned principally with finely divided leaves, and small compound flowers, of no beauty, in spikes and clusters.

Class and order, *Syngenesia Polygamia Superflua*.

Characters.] Compound flowers. CALYX, the general cup roundish and scaly. COROLLA, many hermaphrodite florets compose the middle, and females the border. STAMINA, in each hermaphrodite floret five filaments. PISTILLUM, a germen and style in the florets of both sexes, and bifid stigma. PERICARPIUM none: a single naked seed succeeds each germen.

There are upwards of forty species; those cultivated for use and ornament are,

1. ARTEMISIA *vulgaris*.

The Common Mugwort.] Artemisia with pinnatifid, many-parted, sessile leaves, downy

underneath, and erect firm stalks rising among the leaves, two feet high, each terminated by a long simple spike of small purplish flowers; the radius composed of five florets.

Varieties of this.] Common plain-leaved Mugwort.—Silver striped-leaved Common Mugwort.—Gold-striped Mugwort.

2. ARTEMISIA *Absinthium*.

Common Wormwood.] Artemisia with compound, many-parted, finely divided, whitish leaves; shrubby stalks growing two feet high, closely adorned with leaves, and globular heads of flowers, hanging from the sides of the stalks.

3. ARTEMISIA *pontica*.

Roman Wormwood.] Artemisia with multiparted, very finely divided leaves, hoary underneath, herbaceous stalks, growing a foot and half to two feet long, covered with leaves, and globular heads of yellow flowers, nodding from the sides of the stalks.

4. ARTEMISIA *maritima*.

Sea Wormwood.] Artemisia with multiparted, divided, very downy leaves, shrubby stalks, two feet high, adorned with leaves, and drooping alternate spikes of flowers from the sides of the branches.

5. ARTEMISIA *arborescens*.

Tree wormwood.] Artemisia with an erect, woody, branching stem, grows six feet high; tripinnatifid leaves composed of multifid, linear, very hoary, whitish segments; and flowers in roundish heads at the ends of the branches.

6. ARTEMISIA *Abrotanum*.

Common Southernwood.] Artemisia with shrubby, erect, very branchy stalks, three feet high; finely divided, branchy, bristly, odoriferous leaves, and the stalks and branches terminated by long spikes of flowers in autumn.

Variety.] Dwarf Southernwood—White-leaved Southernwood.

7. ARTEMISIA *Dracunculus*.

Tarragon.] Artemisia with small, narrow spear-shaped, entire, smooth fragrant leaves, and annual stalks one or two feet high.

The flowers of all these species are compound (see the *Characters*), very numerous, though small, and of no beauty.

The *Artemisia vulgaris* and Common Wormwood are wild inhabitants of uncultivated places, by road sides, by lanes, banks, and under walls and hedges about country villages; but being efficacious in medicine, are often cultivated in gardens, where they are also sometimes admitted as plants of variety or observation, particularly the variegated Mugworts.

The Roman Wormwood is an exotic of Hungary and Thrace, but is retained in our gardens for variety and uses in medicine.

The Sea Wormwood inhabits the sea-shores of England, and is sometimes admitted in gardens for variety, and as a medical plant.

The above four species flower in June, July, and August, and ripen abundance of seed.

They may be raised abundantly from seed, in almost any situation or soil; and by slips, cuttings, and by parting their roots in autumn or spring.

The Tree Wormwood is an exotic of Italy; it is a hoary ever-green, and considered here principally as a green-house plant, although it will often succeed in the full ground, and by its hoary whitish leaves makes a pretty appearance any where. It is propagated by cuttings in a shady border, in April, May, and June, and in autumn some should be potted for shelter in winter, and some may stand to take their chance in the full ground.

The Southernwood is one of our smallest hardy deciduous shrubs, will grow any where, and affords variety in common borders, and the fronts of shrubbery clumps, &c.

It is propagated with facility by slips and cuttings of its branches, in a shady border in April; and as many small stems rise from the root, these, in spring or autumn, &c. may be slipped or divided into as many parts as are furnished with the least fibre, and plant them in rows nine inches distance: they will form handsome plants after one summer's growth.

The Tarragon, being a warm and fragrant aromatic, is used as a salad and soup herb; it is perennial, and propagated by its roots, or cuttings of its young shoots in April and May.

ARTOCARPUS, The Bread-fruit tree.

This celebrated genus comprehends two high-growing trees, with large divided and entire leaves and amentaceous flowers.

Class and Order, *Monœcia Monandria*.

Characters.] Male and female flowers on the same tree. **CALYX**, none; but a cylindric amentum covered with floscules. **COROLLA** to each, two oblong concave blunt petals. **STAMINA**, a single filament within the corolla of the same length, topped with an oblong anthera. Female flowers neither cup nor corolla. **PISTILLUM** many germs, connected in a hexangular globe, filiform style to each, with one or two capillary revolute stigmas. **PERICARPIMUM**, an oval-globose fruit, compound and muricated, with a single oblong seed in each germ, and covered with a pulpy aril placed in an ovate receptacle.

The known species are,

1. **ARTOCARPUS incisa**.

Cut-leaved Artocarpus, or the Bread-fruit tree.] Rises with a very large, upright trunk, abounding in a milky juice; and spreading out

branches horizontally below, and forming a semi-globular head, thirty or forty feet high, garnished with petioled, oblong leaves, deeply divided above the middle into several incisures, and are two feet long, and a foot broad; the male flowers come out among the upper leaves of the twigs, and the female flowers at the ends; these are succeeded by a globular smoothish fruit from six to nine inches diameter, filled with a farinaceous pulp, which, when ripe, becomes juicy and yellow.

Varieties.] *Bread-fruit tree* without seeds—with oval seedless fruit, and leaves more deeply cut—with oblong rugged seedless fruit.

2. **ARTOCARPUS integrifolia**.

Entire-leaved Artocarpus, or East-Indian Jacca-tree.] Rises with a large trunk, alternate spreading branches, and hairy twigs, garnished with oval-oblong, blunt, undivided leaves, with distinct male and female flowers on the same branch, and large fruit filled with many ovate-oblong seeds.

The Bread-fruit tree grows in abundance in the South-sea Islands and many parts of the East Indies: of the inner bark the natives form their clothing; the wood is useful for building; the leaves for napkins; and the fruit, when green, a wholesome food, when baked or roasted.

Both species are propagated by suckers, seeds, or layers.

By suckers: these may be taken up in the spring, and planted in pots in the stove. By layers: lay down the young shoots in the beginning of summer, and the next spring may be taken off and planted in pots as above: and by seeds may be propagated by sowing them in pots of rich earth, and plunging them in a hot-bed of a moderate temperature, and afterwards transplanted and plunged in the bed in the stove, and managed as other woody trees of the stove in like manner.

ARUM, Wake-Robin, or Cuckow-Pint.

The plants are herbaceous perennials of the common borders and stove, mostly acaulis, i. e. no stalk, but rise with large leaves directly from the root; though some are caulescent, and between the leaves rises a large spadiceous, apetalous, club-shaped flower, of singular structure.

Class and order, *Gynandria Polyandria*.

Characters.] **CALYX** is a large monophyllous spatha, compressed in the middle, and coloured within. **COROLLA**, no petals, but a large simple, club-shaped, coloured spadix, upon which are placed the germina. **STAMINA**, no filaments, but numerous four-sided antheræ sitting close to the spadix, with a double row of hair-like nectaria between

tween them. *PISTILLUM*, numerous oval germina furround the spadix; no styles, but many bearded stigmas. *PERICARPIMUM*, many globular berries of one cell, and many roundish seeds.

There are twenty or thirty species, one of which grows naturally in England; all the others are exotics of many different parts of the world, several of which are retained in our gardens: these are,

1. *ARUM maculatum*.

Common Spotted Arum.] Arum without stalk, halbert-shaped entire leaves from the root, and among them rises a short foot-stalk, crowned by a large club-shaped spadix, with red berries.

Varieties of this.] Common Arum with dark spotted leaves—with white spotted leaves—with white and black spotted leaves—with entirely green leaves.

2. *ARUM italicum*.

Italian White-veined-leaved Arum.] Arum without stalk; large, halbert-shaped, white-veined leaves, running out to a sharp point, rise from the root a foot and a half high, on long foot-stalks; and a large erect whitish spatha rises between the leaves, near a foot in height.

3. *ARUM Arisarum*.

Broad-leaved Friar's Cowl.] Arum without stalk; heart-shaped-oblong leaves from the root, and between them is the flower, growing close to the ground, having a bifid spatha and incurved spadix.

4. *ARUM Dracunculus*.

Common Spotted Dragon.] Arum with an erect, thick leaf-sheated stalk, a yard high, finely spotted like a snake's belly, dividing at top into palmated leaves, cut into spear-shaped, equal, entire lobes, and between them proceeds a long, erect, purple spatha, protruding a large erect, club-shaped, purple pistil, or spadix, shorter than the spatha.

5. *ARUM Colocasia*.

Egyptian Arum.] Arum without stalk; large, target-shaped, ovate leaves from the root, two-parted at the base, and with sinuated waved borders.

6. *ARUM trilobatum*.

Three-lobed Indian Arum.] Arum without stalk; leaves from the root, composed of three arrow-pointed lobes, and between them rises the flower on a short foot-stalk, having a long spatha and scarlet spadix.

7. *ARUM bicolor*.

Two-coloured Arum.] Arum without stalk; halbert-shaped, entire leaves from the root, with the disc coloured, the middle of the sheath coarcted, and the lamina erect, pointed,

roundish, and almost convolute. The leaves of this species make a beautiful and singular appearance.

8. *ARUM Arborescens*.

Tree American Arum.] Arum with an erect, jointed stalk, six feet high, arrow-shaped leaves in clusters at top, and the flowers rise between the leaves in long green spathæ, fitting close to the stem.

9. *ARUM Seguinum*.

Dumb-cane Arum.] Arum with a green jointed stalk, seven feet high; oblong leaves, placed irregular at top, of a light green, and the flowers rise between the leaves in long pale green spathæ with white spots, fitting close to the stem.

All these plants are herbaceous, perennial in root, but mostly annual in leaf and stalk, which rise in spring, flower in April, May, and June, ripen seeds soon after, and die to the ground in autumn.

The roots are mostly thick, fleshy, and multiply considerably.

The leaves are large and broad, and some are very beautiful.

The flower-stalks of all the sorts support a single spatha or scabbard, protruding the flowers, having no petals, but a large red or purple spadix or pistillum, elevated like a column, which is succeeded by a cluster of berries, containing the seeds; but very few of these plants ripen seed in this country.

The *Arum maculatum* is a resident of our woods and banks under hedges, but the plants are admitted for variety in pleasure-grounds, in assemblage with the other hardy sorts; but the spotted kinds of them have most merit, and form an agreeable diversity.

The second and third sorts are exotics, though of hardy growth, and have been long entertained in curious gardens for their singular appearance.

The *Arum Dracunculus* is a hardy plant, of so singular and august appearance, that it deserves a place in every collection of herbaceous perennials, although the strange singularity of its maculated snake-like stem is disagreeable to some, and its flower emits a disagreeable odour.

All the above four species succeed in any of the common borders.

The fifth, sixth, seventh, eighth, and ninth sorts are exotics of hot climates, and are preserved here in stoves as plants of curiosity.

Propagation.

The propagation of all the sorts is easily accomplished, and mostly by parting the roots.

The first seven sorts increase greatly by their roots; and the off-sets may be separated, or the

whole root divided in autumn, after they have flowered, or early in spring; those of the hardy kinds are to be planted in the borders, and the tender sorts in pots, and retained in the stove.

Those of the hardy sorts that ripen seeds may also be raised by sowing them in pots in autumn; and if those are plunged in a hot-bed in March, just to bring up the plants, it will forward them greatly.

The Tree Arum and Dumb Cane are propagated by cuttings of the stalks, three joints in length; and, after having lain some time to dry, till the cut part is healed, plant them separately in pots, and plunge them in the stove.

ARUNDO, the Reed.

The plants are mostly herbaceous perennials, some of which rise with herbaceous stalks, from three to twelve feet high; others have tree-like stems, advancing with amazing rapidity of growth to thirty or forty feet in height.

Class and order, *Triandria Digynia*.

Characters.] CALYX is a glume, or husky scale of two valves. COROLLA, two acuminate husky valves, downy at the base. STAMINA, three filaments, and horned antheræ. PISTILLUM, a germen, two reflexed styles, and simple stigmas. PERICARPium, none; and the seed is single.

The plants are of the grass tribe, and produce their flowers in spikes, which have no beauty.

The species of note are,

1. ARUNDO *phragmites*.

The Common Marsh Reed.] Arundo with slender erect stalks, six or eight feet high, terminated by loose panicles of flowers, growing five in each cup.

2. ARUNDO *Donax*.

Portugal Reed.] Arundo with large erect stems, ten or twelve feet high, terminated by diffuse panicles of flowers, growing three in each cup.

3. ARUNDO *versicolor*.

Variegated Reed.] Arundo with erect firm stalks, four or five feet high, adorned with variegated leaves, and terminated by diffuse panicles of flowers.

4. ARUNDO *Bambos gigantea*.

Bambu-Cane, or Great Indian Reed.] Arundo with a very large erect stem, growing thirty or forty feet high, adorned with very large, long, and pointed leaves, and sessile spikes, having one or several flowers in a cup.

The first three sorts are hardy, but the Bambu-Cane cannot live in our climate, unless it is indulged with a place in the hot-house.

The *Arundo phragmites*, or Common Reed,

is an inhabitant of our river sides, and standing waters, all over the kingdom, so is rarely admitted in gardens. This species growing in great abundance in marshy situations, and the roots sending up an annual crop of stalks, are, in many places, constantly cut in autumn, and tied in bundles for sale, being useful for various purposes, such as thatching houses, &c. and among gardeners, they are employed in forming shelters, called reed-hedges, being cheap, and quickly made shelter for young and tender plants in winter, both in nurseries and large kitchen-grounds (see REED-HEDGES); for which, and many other uses, great quantities are brought in barges up and down the river Thames to London, where they may be purchased in the warehouses contiguous to the river.

The Portugal or Spanish Reed is retained in many of our gardens for its singular lofty growth; it prospers in any common soil of a garden: the stalks rise annually in spring, frequently from three to twelve from the same root; they are large and jointed, and attain ten or twelve feet stature in three or four months, adorned with large long leaves at the joints; but it rarely flowers here.

The Variegated Reed is, in its general habit, the same as the Portugal kind, only the whole plant is of much smaller growth.

Both these sorts are easily propagated by dividing their roots in February or March, before they begin to shoot forth new stalks; and the slips will shoot the same season, though not with vigour until the second or third year.

The stalks may be cut down every autumn, and used as walking-sticks, &c.

The *Arunda Bambos gigantea* is a native of both Indies, and is retained here in our stoves as a plant of singularity; in its native soil it grows forty feet high, and attains considerable substance; and even in our hot-houses, where there is room, they often grow at the astonishing rate of twenty feet in six weeks; the stems of these Canes are used here for walking-sticks, fishing-rods, &c. but in India the large ones are employed for various purposes, and the leaves, being very large and long, are skewered together to form mats for package, so arrive here in tea-chests, &c. and we often see them in the streets thrown out of the grocers' shops.

The propagation of this Cane is easily accomplished by taking off slips from the roots in February or March, planting them in large pots, which plunge in the bark-bed in the hot-house, where they are always to remain.

As they grow naturally in marshy places, they must be plentifully watered.

ASARUM,

ASARUM, *Asarabacca*.

The plants are low herbaceous perennials, adorned with simple leaves and apetalous flowers, which rise but very little from the ground, and are retained in gardens for variety, and some as medical herbs.

Class and order, *Dodecandria Monogynia*.

Characters.] CALYX is monophyllous, bell-shaped, coloured, three-parted, and reflexed at the brim. COROLLA, none. STAMINA, twelve filaments, and oblong antheræ. PISTILLUM, a germen, cylindric style, and six-parted stigma. PERICARPIUM, a leathery capsule of six cells, having oval seeds.

The species are,

1. *ASARUM europæum*.

Common European Asarabacca.] Asarum with kidney-shaped, bluntly two-pointed, shining leaves, rising from the root on short foot-stalks, and among them purple flowers, close to the ground.

2. *ASARUM canadense*.

Canada Asarabacca.] Asarum with large kidney-shaped, pointed, hairy leaves from the root, on long foot-stalks, and among them greenish flowers, sitting close to the ground.

3. *ASARUM virginicum*.

Virginian veined-leaved Asarabacca.] Asarum with heart-shaped, rounded, smooth, veined, and spotted leaves from the root, on very long foot-stalks, and dark purple flowers elevated among the leaves.

They are all hardy, herbaceous, fibrous-rooted perennials, whose leaves and flowers rise directly from the root, and grow near the ground; the flowers of the first and second sorts having very short foot-stalks, are insufficient to elevate them above the leaves; but those of the third being much longer, the flowers are more conspicuous.

They flower in May, and ripen seeds in August.

Considered as plants of ornament, they make no great figure; but as plants of singularity in their flowers, mode of flowering, &c. they merit places in the front of borders, and other compartments, among plants of lowest growth.

As medicinal plants, the Common Asarum is the sort prescribed, and is efficacious in many disorders.

The propagation of all these three species is by parting their roots in autumn or spring.

ASCLEPIAS, Swallow-Wort, comprehending also several sorts of Dog's-Bane, removed by Linnæus from the genus *Apocynum*.

This genus furnishes a choice collection of tall flowery perennials, both herbaceous and

shrubby, of the full ground, green-house, and stove, attaining from two to seven feet stature, ornamented with simple leaves and monopetalous flowers, in clusters.

Class and order, *Pentandria Digynia*.

Characters.] CALYX is monophyllous, and five-parted at the brim. COROLLA, a single petal cut into five oval segments, and five horned nectaria encompass the fructification. STAMINA, five scarcely visible filaments, and five antheræ situated between the nectaria. PISTILLUM, two oval germina, two short styles, and single stigmas. PERICARPIUM, two large oblong swelling pods, having compressed seeds.

The following ten species are those chiefly known in the English gardens; the first eight of which are herbaceous and hardy.

1. *ASCLEPIAS Vincetoxicum*.

Common White Swallow-Wort.] Asclepias with erect jointed stalks, growing two feet high; ovate leaves by pairs, bearded at the base; and white flowers in branching clusters near the top of the stalks.

2. *ASCLEPIAS nigra*.

Black-flowered Swallow-Wort.] Asclepias with slender stalks, rising three feet high, twining at top; oval-spear-shaped opposite leaves, by pairs, bearded at the base; and black flowers in branchy clusters from the upper part of the stalks.

3. *ASCLEPIAS lutea*.

Yellow Swallow-Wort.] Asclepias with infirm stalks, two feet long, narrow oval acute leaves, and yellowish flowers in simple clusters near the top of the stems.

4. *ASCLEPIAS syriaca*.

Syrian Broad-leaved Purple Dog's-Bane.] Asclepias with very creeping roots, sending up strong erect simple stems, four feet high, having large, oval, thick leaves, by pairs, downy underneath, and purplish flowers in nodding clusters near the top of the stems.

5. *ASCLEPIAS purpurascens*.

Purple Carolina Dog's-Bane.] Asclepias with erect stalks growing a yard high, adorned with oval leaves, by pairs, hairy underneath, and the stems terminated by erect umbels of purplish flowers, having declinated nectaria.

6. *ASCLEPIAS verticillata*.

Whorled-leaved Maryland Asclepias.] Asclepias with erect slender stems, two feet high, narrow revolute leaves placed in whorls round the stalk, and the stalks crowned by umbels of white flowers.

7. *ASCLEPIAS decumbens*.

Decumbent Orange-coloured Virginia Dog's-Bane.] Asclepias with declinated hairy stalks, a foot and half long, garnished with oval, hairy, opposite

opposite leaves, and the stalks terminated by compact umbels of orange-coloured flowers.

8. *ASCLEPIAS tuberosa*.

Tuberous-rooted Erect Orange-coloured American Dog's-Bane.] *Asclepias* with a large tuberous root, erect divaricating hairy stalks, a foot to two feet high, adorned with spear-shaped, hairy, alternate leaves, and the stalks surmounted by umbels of orange-coloured flowers.

The following is a green-house plant.

9. *ASCLEPIAS fruticosa*.

Shrubby Asclepias.] *Asclepias* with shrubby, erect, very branchy stems, growing six or eight feet high, all the branches closely garnished with long, spear-shaped, smooth leaves, and white flowers in single loose umbels, on long foot-stalks, from the sides of the branches.

The following is a stove plant.

10. *ASCLEPIAS curassavica*.

Curassavan Scarlet Asclepias.] *Asclepias* with erect single stems, rising five or six feet high, spear-shaped, smooth, opposite leaves, having foot-stalks, and flowers from the upper parts of the branches, in erect single umbels, having scarlet petals, and saffron-coloured nectaria.

All these plants are exotics, the first two or three are of Europe: the others principally of America, and are retained here as plants of ornament.

The first eight species are hardy herbaceous perennials, with fleshy, fibrous, abiding roots; but the stalks are annual, they rising in spring, attain their full growth in three or four months; flower in June, July, and August; perfect seeds in September, and soon after the whole dies down to the ground.

Ripe seed however is only to be expected here principally from the first four sorts, and sometimes from the *Asclepias decumbens* and *tuberosa*.

The above eight hardy species are elegant furniture for the pleasure-ground; they will succeed in the common borders, and may be employed in the embellishment of the shrubbery clumps, disposing them towards the front, and their general culture is the same as other hardy herbaceous perennials. See HERBACEOUS PLANTS.

Observe however that as the two Orange Dog's-Banes are sometimes affected by severe frost, it is eligible to allow them a warm dry situation, also to pot some of each for shelter in winter.

The *Asclepias fruticosa*, and the American Scarlet *Asclepias* are tender exotics; the former that of the green-house, and the latter of the stove. These are elegant plants, and remarkably beautiful when in flower, which is

generally from about Midsummer until October, and they frequently afford us ripe seed for their propagation. They must always be cultivated in pots, and the former sort placed in a green-house in winter, and the other must be retained always in the stove; and as they are milky plants, should be very sparingly watered in winter.

The flowers of all these ten species are produced in umbellated clusters; each separate flower is rather small, and formed of one leaf or petal, and five horned nectaria. See the *Characters*.

Propagation of all the Species.

The first six species are propagated plentifully by dividing the roots in autumn, when the stalks decay; or in spring, before new ones begin to shoot forth.

They may also be raised from seed in a bed of common earth, in March and April.

The seventh and eighth sorts are propagated occasionally by off-sets, or principally by seeds in pots of light earth in spring, plunging them in a hot-bed, and when the plants appear, inure them by degrees to the full air; then prick them upon a sheltered border, six inches apart, giving occasional shade and water; also shelter from frost in winter by covering the bed with litter or mats, and in March transplant them where they are to remain.

The Shrubby *Asclepias* is propagated by seed and by cuttings. By seed: sow them in pots of light compost in March or April, and plunge them in a hot-bed, and when the plants are three inches high, prick them in separate small pots, giving shade and water. By cuttings: plant them in pots any time from March till Midsummer; move them to the shade, and give water; and in autumn they will be rooted, when they are to be separately potted, moving the whole to the green-house in October.

The tenth sort is also raised from seed in a hot-bed; when the plants are three inches high, prick them in separate pots, and plunge them directly in the hot-house.

ASCYRUM, St. Peter's-Wort.

This genus furnishes several perennials, with oblong or oval leaves, and quadripetalous flowers.

Class and order, *Polyadelphia Polyandria*.

Characters.] *CALYX*, a four-leaved cup. *COROLLA*, four oval petals, the opposite outward ones larger than the others. *STAMINA*, many bristly filaments, joining at their bases in four parts, and topped with roundish antheræ. *PISTILLUM*, an oblong germen, with scarce any style, crowned with a single stigma. *PERICARPIUM*, an oblong, pointed capsule with one cell, containing many small roundish seeds.

The

The species are,

1. *Ascyrum Crux Andree.*

Common Ascyrum, or St. Andrew's Cross.]

Ascyrum with very short stalks, small oval leaves; loose spikes of yellow flowers, produced between the divisions of the branches.

2. *Ascyrum villosum.*

Hairy St. Peter's-Wort.] Ascyrum with upright stalks three feet high, hairy, oblong leaves, and yellow flowers at the ends of the stalks.

3. *Ascyrum Hypericoides.*

St. John's-Wort-like shrubby Ascyrum.]

Ascyrum with stalks three feet high, oval, smooth leaves growing opposite, and flat stalks terminated by larger yellow flowers.

The two first species are hardy enough to stand our winters, but the third requires some protection in hard weather.

Their propagation is either by cuttings, laying down the branches, or parting their roots: by cuttings, in May; by laying, in autumn or spring; and by parting the roots, at the same seasons.

ASHES, for Manure to Land.

Ashes, as manure or dressing to land, may be applied to considerable advantage in cold, heavy, inactive soils.

There are several sorts of Ashes used in the improvement of land, such as Coal-ashes, Wood-ashes, Turf-ashes, Fern-ashes, Furze and Heath-ashes.—Ashes of all sorts of burnt vegetables, such as burnt weeds, sedge, straw, stubble, bean haulms, &c. also Pot-ashes, and Soap-ashes from the soap-boilers.

All these sorts of Ashes are of particular utility in the improvement of cold, wet, stubborn land, to warm, open, and loosen the mould, and augment its vegetable and prolific quality.

Coal-ashes are particularly efficacious in the meliorating and fertilising all cold, stiff, or clayey soils, in gardens or fields, and in grass ground of the above quality; they have a great effect in preventing the rankness and coarseness of the grass peculiar to such soils, by making it come finer, and rendering it more sweet for cattle to feed on.

ASH-KEYS, the fruit or seed-vessel of the Ash-tree. See *FRAXINUS*.

ASPALATHUS, African Broom, consists of a genus of shrubby exotics, ornamented with papilionaceous flowers.

Class and order, *Diadelphia Decandria*.

Characters.] CALYX is monophyllous, cut into five pointed segments. COROLLA is papilionaceous; the vexillum is oval, compressed and rising upwards, the wings obtuse, lunulated and opening, and the keel bifid. STAMINA, ten diadelphous filaments, and oblong

antheræ. PISTILLUM, an oval germen, an ascending style, and an acute stigma. PERICARPIUM, an oval pod, containing one or two kidney-shaped seeds.

The most common species are,

1. *ASPALATHUS indica.*

Indian Aspalathus.] African Broom, with sessile quinate leaves, and red flowers on long footstalks.

2. *ASPALATHUS argentea.*

Silvery Aspalathus.] African Broom, with ternate, linear, silky, white leaves, simple mucronated stipules, and scattered, downy, yellow flowers.

3. *ASPALATHUS albens.*

White Aspalathus.] African Broom, with fascicled, awl-shaped, silky leaves, and flowery fascicles scattered.

These are ornamental plants for the greenhouse, growing about four or five feet high, and the ends of the branches garnished with butterfly flowers.

Their propagation is by seeds sown in the spring, in pots filled with light earth, and plunged in a moderate hot-bed, and the next spring the plants will appear, when they must be transplanted into single pots, and replunged to forward their growth, inuring them by degrees to bear the open air, where they may remain till autumn, and then removed to the greenhouse with the other plants of the like kind.

ASPARAGUS, *Asparagus*, falsely called Asparagras.

The common Asparagus is one of our choicest esculents of the spring and beginning of summer, and highly merits culture in every garden.

But besides the Common Garden Asparagus, the botanists present us with nine or ten other species in the same genus, under the title of Asparagus, which are principally shrubby exotics of the greenhouse; several of which are retained in our gardens, which we shall take notice of after the culture of the esculent kind.

Class and order, *Hexandria Monogynia*.

Characters.] CALYX, none. COROLLA, six petals, forming a tube below, and spread at top. STAMINA, six short filaments, and roundish antheræ. PISTILLUM, a trigonous germen, very short style, and prominent stigma. PERICARPIUM, a globose berry, of three cells, each having two roundish seeds.

We shall first of all proceed in the culture of the common Asparagus; and the following is the species.

Asparagus officinalis.

Common Asparagus.] Asparagus, with erect

herbaceous stalks; three or four feet high, and very fine bristly leaves.

This is a perennial fibrous-rooted plant, the roots being of many year's duration; but the tops or stalks are annual, and the plants being raised from seed, they, after having acquired a period of three or four years' growth, produce proper-sized Asparagus, of which, the same roots furnish an annual supply for many years, continuing to rise in perfection for six or eight weeks each summer; then the shoots run up to stalks, flower, and perfect seeds in autumn.

It is the young shoots of the advancing stalks of the plant that are used, which, when from about two or three, to four or five inches long above the surface of the ground, are in the greatest perfection.

The natural season of these plants for use is, from about the beginning of May, until the middle or latter end of June: that is, the fourth week in April, or first in May, the roots begin to send up shoots or buds; and as often as these are gathered, new ones continue rising in succession from the same roots; but in order to preserve the roots in vigour, it is advisable to leave off cutting the buds about the third or fourth week in June. The common rule is, to continue cutting about six or seven weeks, then permit the whole to run up to stalk.

But besides the crop of natural Asparagus in summer, it may also be obtained in perfection in winter, and early in spring, by the aid of hot-beds. See the *Method of forcing Asparagus*.

Propagation of the Plants.

The propagation of Asparagus is by seed only, which is sold cheap enough at all the seed shops. It is to be sown in February, or beginning, or any time of March, in a four-foot wide bed of rich earth, either broad-cast on the surface, and directly rake it in, or in drills longways, six inches asunder, and rake the ground.

In six weeks, or thereabouts, the plants will appear. Keep them clean from weeds all the summer, and in winter spread a little short, stable-litter on the ground, to defend the crowns of the roots from frost, and in spring following they will be fit to be transplanted, where they are finally to remain, as hereafter directed, which, in two or three years after, will produce Asparagus fit to gather; for, observe, Asparagus is always three years, at least, from the time of sowing the seed, till the plants obtain strength enough to produce shoots of due size for the table; that is, one year in the seed-bed, and two after being transplanted;

though it is sometimes three or four years after planting before they produce good full-sized shoots; but the same plantation will continue producing good Asparagus ten or twelve years, nay, will even endure fifteen or twenty years; but at that age, the shoots will be small, and the whole annual produce inconsiderable; a new plantation should therefore be made once every eight, ten, or twelve years, as you shall judge necessary.

If you are desirous to have a new plantation of Asparagus, fit for use, as soon as possible, you may gain a year, by purchasing ready raised year-old plants of the nursery-men, or kitchen-gardeners.

Method of Planting.

The time of year to make a plantation of these plants, is any time in March, in common light ground, and at latest, the first or second week in April; but in cold very moist soils, from about the twentieth of March to the 15th of April, is the proper time to plant them in such land.

With regard to soil and situation, the plants succeed tolerably in any common mellow soil of the kitchen-garden; but it is, however, eligible to allow them a spot of the very best and richest moderately light ground, in one of the open quarters, exposed to the free air and full sun; for this is of much importance. Dung must be added, six or eight inches thick at least. The ground is then to be trenched one or two spades deep, as you shall see necessary, burying the dung regularly in each trench, observing, if you trench but one spade deep, bury the dung in the bottom; but if you dig two spades, bury it betwixt the first and second spit, about ten or twelve inches below the surface; and if the trenching is performed in winter, or any considerable time before the planting season, it is proper to throw the ground in ridges, to meliorate and improve by the weather in better preparation for planting, as well as for the greater benefit of the young plants; so level it down when the time for planting arrives, which will be a further additional improvement. See TRENCHING and RIDGING GROUND.

The necessary space of ground to plant for private service, is from about four or five, to fifteen or twenty rod, making the calculation according to the extent of the family.

The proper quantity of plants to a rod, exclusive of the alleys, is about 260.

Always chuse one year old plants, not older, as those of that age will establish themselves sooner, and more effectually than older roots.

The plants, at the time of planting, con-

first only of roots; they, at the proper time, are to be taken up from the seed-bed with a dung-fork, as entire as possible; and sort out the strongest for planting, which are not to be trimmed, only cutting off such parts as are broken or bruised.

They are to be planted in rows a foot asunder, and formed into beds, each bed to consist of four rows, ranging lengthways thereof, and planted in drills, or small narrow trenches as hereafter explained; allowing three feet and a half interval between every four rows, two feet of which to be afterwards allotted for an alley between, and the rest to be annexed to the beds, which, as well as the alleys, must be regularly laid out in their proper dimensions, four feet and half the beds, and two feet each alley between bed and bed, as above intimated.

Or, in proceeding to the planting, may first mark out and form the beds and alleys, regularly in their respective dimensions, the beds four feet and a half, and tread out the alleys between the different beds two feet wide; then mark out four spaces a foot asunder for four rows lengthways of each bed, the two outside rows of each to be nine inches from the edge; stretch your line tight longways the bed in the first outside row, and with the spade held in an erect position, the back towards the line, cut out a small neat trench along close to the line, about six inches deep, forming the side next the line upright, turning out the earth evenly to lie close along the edge of the trench, ready to earth in the roots according as planted; this done, proceed to planting that row, placing the plants in the trench close against the upright side, ten or twelve inches asunder, with the crowns upright about two inches below the surface, spreading the roots a little both ways, and draw a little earth up to those of each plant as you go on, just to fix them in their places till the row is planted; then, one row being thus planted, directly rake in the excavated earth into the trench over the roots and crowns of the plants, evenly and regular; which done, move the line a foot further to the next row, cut out another trench, as above, and plant it in the same manner, and directly earth over the plants, as in the first row; and thus proceed regularly with the rest till the whole is planted; but, as before intimated, the planting may be effected without immediately forming the beds and alleys; that is, beginning at one end of the plat of ground, set your line along cross-ways, about eighteen inches from the edge, cut out a narrow trench as above, and plant it in the same order; so moving the

line a foot further on, plant another row in like manner; and so proceed with the others; allowing four rows, a foot asunder, for each bed; and between every four rows, allotting a clear space of three feet and a half as before suggested, two of which are for the alleys, and the rest added to the beds as hereafter, at the time when the beds and alleys are to be regularly formed; and in this manner proceed in planting as many beds as intended, till the whole is completed; placing a short stake at the corners of each bed as a distinctive mark for the beds and alleys.

Having finished the planting in either of the above methods, the beds and alleys may either be lined out now regularly, or deferred till the winter and spring-dressing; though where the beds, &c. are formed previous to the planting, it may be eligible to line them out neatly in their proper dimensions as soon as planted; making the edges of the beds full and straight, and the alleys level or even:—in the other method, either forming the beds and alleys now or afterwards, as above hinted; observing, that, of the wide intervals of three feet and half between the beds, two feet only are to be allowed for the alleys, the other eighteen inches must be added to the beds, which makes each bed four feet and a half wide, nine inches on each side wider than the outside rows; and observing, in either method, that if the beds, &c. are formed as soon as planted, the alleys at this time are only to be trodden out gently the proper width, without casting out any of the earth upon the beds; so to stand in the alleys, and lightly rake the beds even, drawing off any large stones and lumpy clods, leaving a smooth surface.

But in making the above plantation, if you have occasion to make the most of every spot of ground, a thin crop of onions may be sown the first year on the same plat as soon as the Asparagus is planted; sow the seed moderately thin, and rake it in regularly with a light and even hand, so as not to displace any of the Asparagus plants.

The Asparagus being planted, their culture is as follows. Their shoots will appear above ground the beginning of May, not much bigger than straws, so must be permitted to run wholly to stalk. During summer they must be kept clean from weeds, by small-hoeing or hand-weeding them three or four times in the course of that season; and if there is a crop of onions, thin them in the usual way, cutting up any that grow immediately close about the Asparagus. In October, when the Asparagus stalks decay, cut them down, clear off all

weeds, from the beds into the alleys; and then dig the alleys two feet wide (see *Winter Dressing*), burying the weeds therein, and spread some of the earth over the beds, which is all that is necessary to be done until March, at which time the beds should be deeply hoed and raked smooth, permitting all the shoots to run as in the first summer; and in October, cut down the decayed haulm as before, and land up the beds. In spring following, being the second after planting, slightly fork-dig the beds (see *Spring Dressing*), and rake them level, and in this spring the shoots will rise of some tolerable substance, when, may begin the first gathering in some of the largest in the first fortnight, but not to practise any general gathering till the third or fourth year. See *Gathering the Produce*.

Winter Dressing, or Landing up the Beds.

From about the middle of October, to the latter end of November, is the time to give the Asparagus beds their Winter Dressing.

This dressing consists in cutting down the decayed stalks of the plants annually at the above time, and clearing the beds from weeds, digging the alleys, and spreading some of the earth on the top of the beds, which is called landing up the beds.

It is done in the following manner.

The decayed stalks or haulm are to be cut down with a knife close, or within an inch or two of the ground; then with a sharp hoe cut up all weeds, at the same time drawing them off into the alleys to be buried. This done, proceed to line out the alleys, stretching the line along the edges of the beds about nine inches from each outer row of plants; the stakes advised to be placed at the corners of the beds, or otherwise the stumps of the stalks, will be a guide; then with a spade chop the ground along by direction of the line, by which you form each bed four feet and half wide, and the alleys two feet. The alleys are then to be dug one spade deep, and a good portion of the earth spread over each bed two or three inches thick; as you proceed in digging, let the weeds drawn off the beds be trimmed into the bottom, and buried a due depth, observing to land the beds all a regular thickness, so as to make them about six or eight inches higher than the level of the alleys, forming the edge of each bed full and straight.

The above work of landing the Asparagus beds must be repeated every autumn.

It may by some be thought, that, by an annual landing of the beds, they in several years will be considerably raised; but observe, that by the spring forking and raking, together with the repeated hoeings and clearing off

weeds in summer, and at the time of preparing for landing up in autumn, a considerable part of the earth is annually drawn off again into the alleys.

After performing the winter dressing of these beds, a row or two of cabbage plants may be planted in each alley, as a place of shelter during winter, by which they will be forwarded for early spring coleworts; or a row of mazagan dwarf beans may be planted in November or December, in the warmest side of each alley, for an early crop; or occasionally, where ground is scarce, might occupy some of the beds during winter, by planting a crop of cabbage lettuce thereon for spring service, which being all gathered or transplanted elsewhere by the beginning of April, do not injure the Asparagus.

Of the Spring Dressing the Beds.

The Spring Dressing of Asparagus beds consists in fork-digging the beds annually to a moderate depth, to loosen the soil, that the buds may freely advance and swell to their due size.

The time for performing this work is any time in March, but not to defer it later than the first or second week in April, because many of the buds will then be formed, and, in forward seasons, begin to advance in growth.

This work of loosening the beds is performed with a short, flat, three-pronged fork.

Observe, however, that in the first spring dressing after planting, it is proper to loosen the surface only with a hoe, two or three inches deep, and so rake the beds smooth.

But in respect to the general spring dressing, it is to be annually performed by fork-digging, to all such beds as have been planted more than one year, which should be slightly dug three or four inches deep with the Asparagus-fork, being careful to loosen all the earth as deep as the surface of the roots, having regard, however, not to wound the crowns of them; and after forking, let all the beds be neatly raked, to break clods, clear off stones, and to form a level and smooth surface, drawing off all rough earth, clods, &c. into the alleys; which afterwards rake up in a neat manner.

Of Dunging, or Manuring the Beds.

These beds should be enriched with an augment of good rotten dung once every two or three years at farthest, the benefit of which will be evident in the quantity, as well as the size and quality of the produce.

The time to apply this manure is at the time of Winter Dressing, or landing up the beds.

The dung for this purpose should be perfectly well rotted; none better than the dung of

of old cucumber and melon beds, or any other of similar quality, which should be applied when the stalks and weeds are cleared off: the dung is to be spread two or three inches thick over the surface of each bed, and a double portion in the alleys; the beds are then to be slightly fork-dug to bury the dung; after this dig the alleys in the usual way, and spread a portion of the earth evenly over the beds.

The winter rains will wash the enriching quality of the above manure into the beds, and the roots will reap the benefit thereof in spring.

Of Gathering the Produce.

We formerly observed, that Asparagus, from the time of sowing the seed, till the plants produce buds large enough for use, is commonly three or four years; that is, one in the seed-bed, and two or three after being transplanted; they, however, sometimes, in very rich ground, yield tolerably large buds the second year, but of which I should advise to cut only here and there one of the largest that happen to appear the first week or fortnight; afterwards permit the whole to run to stalk; but in the third year you may perform a more general gathering, and continue it a month or five weeks; and in the fourth year, the general produce will rise in its utmost perfection: you may then, and every succeeding year, gather all the buds arising from every plant during the season of Asparagus.

The proper size of the Asparagus for use is, when the shoots are about two or three to four or five inches high above the surface of the earth, while the heads remain compact and plump.

The principal season of cutting them is from the latter end of April, or beginning of May, according to the forwardness of the season, until the middle or latter end of June.

They might, however, be obtained a month or two longer in the season, by continuing to cut all the buds according as they attain proper size; but this would be a very wrong practice, as the roots would thereby continue sending up a fresh supply, till they in a manner exhausted their vegetable fund, as would be apparent by the inconsiderableness of the future year's crop, and short duration of the plants.

The principal gatherings therefore should be terminated generally towards the latter end of June, especially as by that time there will be plenty of young peas, to substitute as a dish at table in lieu of the Asparagus.

If late Asparagus is however wanted, some beds should be set apart for that purpose, exclusive of the main crops.

For the purpose of cutting the Asparagus for use, it is necessary to be furnished with a

strait narrow-pointed knife, the blade six or eight inches long, teathed on the edge like a saw; and in cutting the Asparagus, slip the knife down close to each separate bud, and cut them off slanting three or four inches within the ground, being careful not to injure any of the younger buds rising in succession, there being generally several from the same root, advancing in different stages of growth.

Forcing or raising early Asparagus.

As many families are anxious to have Asparagus in winter, and early in spring, I shall next proceed to the method for obtaining it also in these seasons.

This is effected by means of planting the roots in substantial hot-beds, covered with frames and glasses, as hereafter directed.

This work is by gardeners called forcing Asparagus.

As this forcing of Asparagus requires a particular degree of attention in its peculiar management whereby to obtain successful crops, I shall endeavour to explain, as fully as possible, the general practical method pursued by the London kitchen-gardeners, who annually raise immense quantities for the markets of that metropolis, and generally have plentiful productions in the greatest perfection: and by the same practice I have experienced every desirable success.

Previous to this work, it must be observed, that when intended to have a constant succession of Asparagus during winter and spring, a new hot-bed must be made, and planted with fresh plants every three or four weeks, for these roots, when forced in hot-beds, do not continue to yield any tolerable produce longer than that period of time, when they will in a manner be quite exhausted, and are not fit for that or any other purpose afterwards: therefore, for this purpose of forcing, a fresh quantity of plants must be in readiness for every new hot-bed: these are raised in the natural ground to a proper age; they must be three or four years old; that is, the plants are raised from seed, as directed for the natural-ground Asparagus, and when they are one year old, transplant them in beds of rich earth, as directed also for the natural plantation, in rows a foot asunder, but need not be more than nine inches distance in each row, forming them in beds of six rows in each, with only two feet alleys, just to go in to clean off weeds, &c. for the beds need not be landed up in winter, as in the natural Asparagus; and when the plants have had two summers' growth, they, in good ground, will be fit for forcing, though they will be in greater perfection, if permitted to stand three years.

During the time they remain in the natural ground, no buds should be gathered, at least very few; but permit the whole to run to stalk each summer.

It must next be observed, that when intended to force Asparagus annually, some seed must be sown every spring, and a due quantity of plants transplanted as before directed, so as to have three different pieces of ground always employed at the same time with Asparagus plants for the above purpose; that is, one piece with seedlings in the seed-bed, the other two with transplanted plants, one to be a year's growth before the other; by which practice, after the three first years, you will obtain an annual succession of plants fit for forcing.

But as some persons may be impatient to wait the raising the plants, or may be anxious to have a supply till their own are ready, in which cases, they may be furnished with them of proper growth, as above, at most of the kitchen-gardeners in the neighbourhood of great towns, particularly that of London, where, when raised to proper growth for this occasion, they commonly sell them by measurement of the ground they grow upon, generally from six to ten shillings per rod, according to the age and size of the plants, and fulness of the crop.

The necessary quantity of plants for hot-beds is considerable, since about as many as grow upon three rods of ground are requisite for a bed intended for a common three-light garden-frame. The common allowance of the London gardeners is about one rod to a light; for the plants are to be placed as close as they can possibly stand to one another, to the amount of five, six, or seven hundred, or more, according to their size, in a three-light box, otherwise a bed would not afford a sufficient supply, adequate to the expense and trouble necessary in the culture of these plants in hot-beds; for, from a bed of the above dimensions, we commonly expect about three hundred large buds, or ware, besides sprew, weekly, and in the whole about eight or nine hundred good Asparagus, and near as many small ones in three weeks, in which period of time the roots will have exhausted their strength, and can produce very little more.

Therefore, in raising or procuring plants for the above purpose, the quantity must be proportioned to the number of lights you intend working, and the succession of Asparagus required, which may be readily calculated according to the foregoing observations.

The season to begin the above work of forcing is according to the time the Asparagus is required for use; as, for instance, if you would have Asparagus at Christmas, it is

proper to make the hot-bed in the first or second week in November, and so on in proportion to any other time of the winter or spring it is desired to have Asparagus fit to gather. The rule is this: if a constant succession is required from about Christmas till the time of the natural Asparagus come in, a new hot-bed should be made every three weeks or a month, as already observed, from the beginning of November until that of March; but some of the London gardeners begin about the latter end of September, in order to obtain Asparagus against Lord Mayor's day, which happens the second week in November.

Previous to making and planting the hot-bed, observe also the following particulars.

As to the hot-beds for this purpose, the proper materials are, a sufficient quantity of horse-stable dung, fresh, and full of heat, wherewith to make the hot-bed for one or more three-light frames, two feet and half, or a yard high; also some to line the sides of the bed when the heat declines; a quantity of good kitchen-garden earth, and one or more three-light garden-frames to place over the bed, and some large garden-mats, to cover occasionally on nights and bad weather.

The dung for making these beds is to be previously prepared, as directed under the article HOT-BEDS.

The situation for the hot-beds should be in some of the warmest sheltered compartments of the kitchen-garden, or in the melon or cucumber ground, if room; though the London market-gardeners, when they make considerable extent of Asparagus hot-beds, often make them in or near some of the large quarters of the kitchen-ground, where the soil is rich and light, for the convenience of having plenty of good proper earth at hand for earthing the bed, banking up the outside plants, and moulding them at top, &c.

The exposure should be open to the full sun, and defended from the northerly winds.

The bed may be made either wholly on level ground, or occasionally in a shallow trench, four or five feet wide, and six or eight inches deep; or, if intended to make it in any of the quarters of the kitchen-ground, a trench might be formed as above, in which to make the bed, for the sake of the earth thereof laid ready for earthing the bed and plants, to save trouble of bringing it from a distant part, especially for beds of considerable length: but otherwise it may be made entirely on the even ground in the most convenient situation.

As to the general dimensions of the bed, it must be in proportion to the width and length of

of the intended frames, or rather a little wider and longer, to allow for three or four to five or six inches clear, on each side and end, whereon to bank up some earth against the outside roots, &c. and must generally be about a yard high, earthed at top six inches thick for the reception of the plants, which are placed entirely upon the top of the earth before the frame is put on, keeping them within the compass thereof, upright, and as close as they can stand, as hereafter directed; and as there being a clear space of a few inches on each outside and end, as above hinted, is to receive a small bank of earth against the outside roots, both to defend them from the weather, and for the support of the frame, the latter of which, on account of the first violent heat, is not put on till two or three weeks after planting the roots; these, as soon as planted and banked up on the outsides, are earthed over the crowns an inch deep, which is increased to five or six, when the buds appear through the first earthing; at which time, as the heat of the bed will be moderate, the frame and glasses are placed thereon. See the *General Culture*.

Method of making the Bed, planting the Roots, and Culture.

In the situation and exposure above described, mark out the place for the hot-bed, of the proper width and length before advised, proportionably to that of the intended frame or frames, whether for one, two, or more; and if a trench is intended, dig out the cavity only one moderate spade deep, and the width as above; then wheel in the dung, and with which form the bed of the proper width and length as above, either on level ground or in a trench, raising it regularly of the same dimensions, about a yard high, especially in winter: but for the late final spring beds, two feet and half depth of dung is sufficient, working the whole upright and firm in the usual way. See *HOT-BEDS*.

When the bed is thus formed, let it be directly earthed at top for the reception of the plants, with finely broken earth six inches thick, to the full width and length of the bed, and rake the surface level and smooth; this done, immediately proceed to place the roots, for no time must be lost in Asparagus hot-beds in waiting for the temperature of the heat. Previous to planting the roots, mark out on the surface of the bed the exact width and length of the frames, so as to have a clear space on each outside of a few inches width, to receive the banking of earth against the outside roots, &c. as before-mentioned; then begin at one end, and raise a small ridge of earth crossways upon the surface, five or six inches high, against which to lay the first row of roots; then having the roots, which are not to be

trimmed, place the first course close against the above ridge, and entirely upon the surface of the bed, with the crowns upright, and as close to one another as you can possibly place them, either wholly upon the top of the earth, or may only draw a little to the lower ends of the roots, or insert the ends a little into the earth, though they are often planted without either drawing any earth about the fibres, or inserting them therein; and when one course or row is thus placed, lay another against these in the same manner, and so proceed, laying them one against another as close together every way as you can possibly crowd them from one end of the bed to the other, being careful to place all the crowns of such an equal height, that the whole may form, as it were, a level surface, keeping the whole rather within the measure of the frame, for they will unavoidably swell out a little on each side; observing, if more frames than one are intended for the same bed, then, at termination of the length of each frame, raise a cross ridge of earth, as at first, about six inches in height; so proceed laying the plants, as before; and when all the roots are thus placed the whole length of the bed, directly bank up some earth on each side and end, as above hinted, against the outside roots, raising it an inch higher than the crowns of them, then cover the crowns all over evenly with finely-broken light earth an inch deep, which finishes the work for the present until the buds appear, which see, for the roots must not till then be earthed deeper, nor the frame and glasses placed upon the bed, till the violent heat has subsided, because they would confine the burning steam, and occasion the bed to heat too vehemently, to the destruction of the plants.

In making the above beds, they sometimes, where necessary to be saving of dung, are made only the exact width of the frame; so to secure the outside roots, and for the support of the frame, raise a bank of earth quite from the ground, six inches broad at bottom, drawing it in gradually to the top, banking it close against the sides of the bed, and that of the outside roots, raising it an inch higher than the crowns of them, so earthing them all over the top an inch deep, as before observed; which method of banking quite from the ground may also prove effectual in preserving the temperature of the bed by defending the dung from driving rains, snow, and piercing winds.

As soon as the beds are made and planted in either of the above methods, then, in order to judge of the temperature of the heat, it is proper to thrust some sharp-pointed sticks, two feet long, down betwixt the roots into the dung of the bed, and by drawing these up daily, and feeling the lower part, you will be able

able to judge of the degree of heat, whether too violent or weak, which is to be regulated accordingly, as hereafter directed.

The beds being made and planted, the roots will soon after send forth fresh fibres into the earth, and even, in time, into the very dung, and the buds of the Asparagus will begin to appear in a fortnight or three weeks; but till that period, as the heat will probably be very strong, the bed is to remain unframed and uncovered, except being occasionally defended at top; or at least, if the frames are placed on the bed, not the glasses fully to remain, only to use them occasionally, if very inclement weather should happen at that time, just to protect the bed and crowns of the plants from excessive wet, or rigorous frosts; or the bed might be occasionally defended with long litter or garden mats, from violent rains, snow, and severe frosty weather, observing, however, to use only occasional covering, as above, just to preserve the heat of the bed and the crowns of the plants, till the buds begin to appear, and the heat is become quite moderate; for at this period too much covering would increase the heat to a violent degree, and scorch or steam-scald the roots, which in strong beds we must, at any rate, be particularly watchful to guard against.

The temperature of heat must therefore be every day examined by the trying-sticks; and if it is found so vehement, that you judge the roots are in danger of scorching, the remedy is, to bore with a large rake-handle, &c. the sides of the bed, quite through in several places, both in the dung, and betwixt the top of the dung and the earth, that the rank steam and burning quality may evaporate at the holes; at the same time the free air will have access, and in two or three days the bed will be reduced to a moderate temperature. On the other hand, should likewise observe that if the bed, in a week or two after being made, does not heat kindly, or seems rather declining, it would be proper to lay dry or warm stable-litter round the sides and over the top, which will forward and revive the heat more effectually.

When the Asparagus begins to appear, they are then to have their final earthing of four or five inches depth of more mould all over the crowns of the roots, and the frame and glasses to be put on. Observe as follows

At this period, i. e. that of the first appearance of the buds, prepare some light, rich, finely-broken earth, sufficient to mould them the above depth; at the same time, in order to secure the outsides of the said final earthing, it is proper to form a sort of wreathing, or empalement, round the top of the edges of the bed, four or five inches high, which is done either with a thick straw-band, or by raising

the outside banking an additional four or five inches, either of which, as just observed, is necessary not only to secure the sides and ends of the said final top covering of earth, but also to support the frames, when finally placed on the bed.

But in respect to the above empalement round the top of the bed, that instead of forming it by banking higher with earth, it is more customary to fix a wreath of straw-bands round the top of the first banking, to serve that purpose, which is done thus: when the buds first appear, make a large straw-band or rope, of dry, long stable-litter, three or four inches thick, and long enough to go round the bed; then upon the top of the banking, exactly in the place where the frame is to stand, place this band round singly in a neat and regular manner, fastening it with pegs stuck through the sides of it into the earth, and when this is fixed, directly earth the buds as high as the said wreath, or about four or five inches deep, as above noticed, so as there may be now, in the whole, about six inches depth of earth all over the crowns of the plants; then, if the heat of the bed is become of a moderate temperature, directly put on the frame, resting it upon the top of the above wreath or straw-band; or in default of this, set it immediately on the top of the banking, having been previously raised as above; after this, you may lay an inch depth of more earth, so as to make the whole full six or seven inches thick.

The bed being now finally earthed and framed, and the heat become moderate, the glasses or lights are to be kept constantly upon the frame, which on nights should be covered with mats, or dry long litter, but must be uncovered every day, except in uncommonly severe weather; for it is of importance, when the Asparagus shoots begin to advance, to admit as much light and sun as possible, to promote a green colour in the tops of the buds; and as to the admission of fresh air, if the heat is moderate, the glasses need only be shoved a little open in fine days, especially if you require the plants to be drawn up quick; but by admitting a larger portion of air, the buds rise slower, and will acquire a larger size and greener colour, on which consideration, may sometimes, in the spring-made beds, take the glasses entirely off a few hours in fine mild dry days, particularly when the heat of the bed is considerable at the first appearance of the buds after the bed is framed.

At this time also, examine the temperature of heat in the bed. When it has been made about three weeks, if but a small bed, the heat will probably begin to decline considerably, which should be renewed by a lining of hot dung

dung applied to the sides; do not omit this, particularly when the buds begin to appear through the last covering of earth, if you should see occasion, though beds of more considerable length seldom require lining till after the first breaking or gathering of the buds; then adding a good lining, it will maintain the bed in due temperature fifteen or eighteen days longer, which is as long as the roots continue yielding any tolerable produce.

In about five or six weeks after the bed is made and planted, we may expect Asparagus fit to gather; when the buds are from two to four or five inches high above the earth, they are of the proper size for gathering; observing that, in performing this in hot beds, it should be done by thrusting the fingers and thumb down into the earth, and breaking the shoots off close to the bottom.

ASPARAGUS FRUTICOSUS, or Shrubby Asparagus.

Besides the esculent species of Asparagus already treated of, there are several other species in the same genus, mostly of shrubby growth, tender exotics for the green-house.

The species of most esteem are,

1. **ASPARAGUS albus.**

White prickly Portugal Asparagus.] Asparagus, with shrubby, very white, thorny stalks, and flexible branches, growing four feet high, ornamented with short, narrow, chaffy, deciduous leaves, in clusters from one point, and sharp spines under each tuft of leaves.

2. **ASPARAGUS declinatus.**

Declinated bristly-leaved African Asparagus.] Asparagus, with several erect, smooth stalks; infirm declinated branches, closely covered with bristly leaves.

3. **ASPARAGUS acutifolius.**

Acute-leaved Portugal Asparagus.] Asparagus, with shrubby, crooked, smooth, whitish stalks, growing about four feet high; small, rigid, acute-prickly-pointed, evergreen leaves, in clusters from the same point.

4. **ASPARAGUS retrofractus.**

Retrofracted great prickly larch-leaved Asparagus.] Asparagus, with shrubby very crooked stalks, rising eight or nine feet high, emitting infirm reflexed branches, adorned with long, fine, narrow, evergreen leaves, in clusters from one point, and a single sharp thorn advancing under each tuft of leaves.

These four species flower here annually, which, like the common Asparagus, are very inconsiderable, and are sometimes succeeded by seeds in England.

The above four species are exotics of the green-house, so must always be kept in pots, and managed as the other plants of that department. See GREEN-HOUSE PLANTS.

Their propagation may be readily effected by slipping the roots in March or April.

If seed can be procured, they may also be raised abundantly that way, by sowing it in pots in March or April, and plunge them in a hot-bed, just to bring up the plants, which in August will be large enough for transplanting into separate pots.

ASPERIFOLIÆ Plantæ, Rough-leaved Plants, and in ancient botany the name of a class, consisting of plants whose leaves are rough to the touch, and have four naked seeds; of which are *Anchusa*, or Bugloss; *Borago*, Borage; *Cynoglossum*, Hound's-tongue; *Symphytum*, Comfrey, &c. the leaves of all of which are simple, alternate, and attached to the stems and branches, without any foot-stalk.

ASPHODELUS, Asphodel, or King's-Spear, so called from the resemblance of its spiked flowery stalk to a royal sceptre.

The plants of this genus are herbaceous flowery perennials, with fleshy fibrous roots, producing annual stalks two or three feet high; terminated by long spikes of many liliaceous flowers of ornamental appearance.

Class and order, *Hexandria Monogynia*.

Characters.] **CALYX**, none. **COROLLA** consists of one petal, cut into six spear-shaped spreading segments, and at bottom a globular nectarium of six valves. **STAMINA**, six subulate arched filaments, alternately long and short, attached to the valves of the nectarium, and oblong incumbent antheræ. **PISTILLUM**, a globular germen within the nectarium, awl-shaped style, and truncated stigma. **PERICARPIUM**, a globular fleshy capsule of three cells, filled with triangular seeds.

There are but three distinct species; all of which have fleshy fibrous roots.

The species are,

1. **ASPHODELUS luteus.**

Common yellow Asphodel.] Asphodelus with an upright, unbranching, large, round, leafy stalk, growing near three feet high, adorned half-way with numerous long, triangular, hollow, sharp-pointed leaves, and many starry yellow flowers, forming a long erect spike from the middle of the stalk upwards.

2. **ASPHODELUS ramosus albus.**

Branching Greater White Asphodel.] Asphodelus with branching unleaved stalks a yard high; sword-shaped, long, hollow, flexible leaves, in large tufts directly from the root, and in the midst of them the stalk, emitting many side branches, adorned upward with long spikes of many large, starry, white flowers, having a purple line running down each segment.

Variety.—*Unbranching white Asphodel.*] Asphodelus,

phodelus, with simple or unbranching leafless stalks a yard high; sword-shaped, very narrow, flexible leaves from the root, and amongst them issue the stalks upright, without branches and leaves, terminated by a very long spike of many starry snow-white flowers.

3. *ASPHODELUS fistulosus*.

Hollow-leaved Minor White Asphodel.] Asphodelus, with upright, branching, leafless stalks, eighteen inches high; awl-shaped, striated, fistular leaves, hollow like a pipe, rising in a large tuft from the root, in the midst of which issue the stalks, dividing upward into a few branches, adorned at top with starry white flowers striped with purple.

Variety.] Fistular-leaved Annual White Asphodel.

The roots of all these Asphodels consist of many thick fleshy fibres, connected at top into one common head; to those of the second particularly, hang many large, oblong, thick tubers, all of which roots are of perennial growth.

The leaves and stalks rise annually from the roots in spring, and perish in autumn, after they have flowered and perfected seeds.

The flowers are numerous, surrounding each stalk from the middle upward, forming a spike of innumerable buds, opening in successive order; each separate flower consists of one leaf, or petal, deeply cut into six segments, so as to appear so many different petals, opening in June, continuing in successive order a month or six weeks, and are succeeded by plenty of ripe seeds in autumn.

All these three species demand attention as plants of ornament, as during their bloom they make a noble appearance, and may be employed as choice furniture for the embellishment of the principal compartments of the pleasure ground.

They succeed in any common soil and situation, and are of easy culture.

Their propagation is easily accomplished by seed, and by parting their roots. Sow the seed in autumn or spring in a bed of light earth, and in April or May the plants will appear, which, in autumn or spring after, transplant into nursery-beds, six inches distance, where they will flower the following summer, and in autumn after remove them into the open borders.

By dividing, or slipping the roots, they may be increased plentifully, which may be performed in autumn or spring. Plant the slips, the smallest in nursery beds, to have one summer's growth; and the larger may be planted directly where they are to remain, and they will all flower the following summer.

ASTER, Starwort, so called from the figure of its radiated flower.

The Asters are mostly herbaceous, fibrous-rooted, flowery plants; some are annual, but the greater part are hardy perennials, producing annual stalks of different statures, from one to five feet in height, the whole adorned with simple leaves, and terminated at top by compound-radiated flowers. See RADIUS.—There are also some shrubby plants of the green-house.

Class and order, *Syngenesia Polygamia Superflua*.

Characters.] CALYX, a scaly, imbricated, general cup, containing numerous florets. COROLLA is compound and radiated; many funnel-shaped hermaphrodite florets form the disc, and flat female florets, three-parted at the end, compose the border or radius. STAMINA, five filaments, and cylindric antheræ. PISTILLUM, an oblong germen, slender style, and bifid stigma; and in the female florets, the style is crowned by two stigmas, which are oblong and revolute. PERICARPIUM, none; and a single downy seed succeeds each floret.

There are upwards of thirty species, several of which produce large and elegant flowers; and those of an annual species, called *China Aster*, are remarkably grand and beautiful; some of the perennials are also very specious and showy, all of which adorn our gardens in autumn.

First of the annual sort, which is,

I. *ASTER chinensis*.

The China Aster, or Annual Starwort, from China, or Queen Marguerette.] Aster with only one stalk from the root, dividing into many spreading branches, growing about two feet high, ornamented with oval, angular, indented foot-stalked leaves, and every branch crowned by one large beautiful radiated flower, appearing in August, September, and October.

Varieties of this are,] China Aster, with single white flowers—single blue flowers—single purple flowers—single red flowers,—with double white flowers—double blue flowers—double purple flowers—double red flowers,—and with variegated blue-and-white flowers; all of which varieties, in their single state, consist of a broad yellow disc, encompassed by a series of flat spreading florets, forming the circumference, or radius; but the double flowers have many series of such florets continued to the very centre.

All the varieties are but of one summer's duration, rising from seed in spring, flower and perfect seed plentifully in autumn, and perish root and branch in November; so a fresh supply must be raised annually.

This species, *Aster chinensis*, is one of the most elegant and showy annuals that ornament

ment our gardens; all the varieties of which are curious furniture for the embellishment of the common borders; and as they are of easy culture, may be obtained plentifully in every garden.

Their propagation is by seed sown annually in March, April, or beginning of May, in a hot-bed, or warm border, from which the plants are to be transplanted into the borders.

Be careful to procure seed of the different varieties, as white, blue, red, &c.

The seed is commonly sown in a moderate hot-bed; it will, however, grow freely in a warm border, if sown about the middle or latter end of April, or beginning of May; but the aid of a hot-bed, just to raise the plants, will forward them sooner, by almost a month, to a state of flowering. Sow the seed either on the surface, or in small drills drawn with the fingers, and cover it a quarter of an inch deep with fine earth; and when the plants appear, inure them betimes to the open air, previous to their being transplanted, and give frequent waterings. See ANNUAL PLANTS.

In May or June, when the plants are three inches high, transplant them into the natural ground in the places where they are to remain to flower, taking opportunity of showery weather, and let them be properly disposed in the borders, and other compartments contiguous to the principal walks, lawns, &c. a yard, at least, distance from one another, where they will make a grand show in August, September, and October, especially if there are varieties of different colours.

For some other particulars in their culture, see ANNUAL PLANTS.

If any are wanted for pots to adorn courtyards, &c. some of the finest double sorts of different colours should be selected as soon as they shew bloom; so take them up with large balls about their roots, and plant one in each pot, giving water plentifully.

To save seed of this species, it should be gathered only from the perfect double flowers of the most lively colours, which will be ripe the end of September and October, taking opportunity of dry days, to cut off the heads as they ripen.

The principal hardy perennial sorts are,

1. *ASTER tradescanti*.

Tradescant's Virginia Star-wort, erroneously called Michaelmas Daisy.] After with numerous, erect, branching stalks, about four feet high, adorned with oblong acute-pointed leaves, broad at the base, which half embrace the stalk, and all the stalks and branches terminated by pale-bluish flowers, appearing in October.

2. *ASTER Amellus*.

Amellus, or Italian Star-wort.] After with

numerous, upright, firm stalks two feet high, ornamented below with oblong-spear-shaped, blunt, three-veined, rough entire leaves, and the tops crowned by corymbose clusters of large flowers, on naked foot-stalks, having a golden centre, and bright blue radius, appearing in October and November.

Variety.] With wrinkled leaves.

3. *ASTER Alpinus*.

Alpine Dwarf Star-wort.] After, with upright unbranching stalks, about seven or eight inches high, garnished with spatula-shaped hairy leaves, the radical ones blunt, and each stalk surmounted by one large purple flower, appearing in June and July.

Varieties.] Dwarf Star-wort with white rays—with blue rays.

4. *ASTER Novæ Angliæ*.

New-England Star-wort.] After with many erect hairy stalks about five feet high, decorated with spear-shaped, cordate, entire leaves, growing alternate; their base half surrounding the stalk, and all the stalks terminated by panicles of large violet-purple flowers, appearing in August and September.

5. *ASTER altissimus*.

Tallest Philadelphia Purple Aster.] After with upright, unbranched, hairy stalks eight or ten feet high; oblong-lanceolate hairy leaves; their base half embracing the stalks, and each stalk terminated generally by three large reddish-purple flowers, appearing in the end of September till November.

6. *ASTER grandiflorus*.

Great Blue Pyramidal Aster, or Catesby's Virginia Star-wort.] After with stalks a yard high, emitting many side-branches, adorned with small, spear-shaped, reflexed, rough leaves, and every branch crowned by one large blue flower, having a rough calyx, appearing in the end of October and in November.

7. *ASTER puniceus*.

Purple-stalked American Aster.] After with upright purple stalks two or three feet high, garnished with spear-shaped, sawed, rough leaves; their base half embracing the stalk, and each stalk terminated by a corymbose cluster of pale blue flowers, growing singly on alternate foot-stalks, appearing the end of September and October.

8. *ASTER linifolius*.

Flax-leaved Aster.] After with strong erect stalks about a yard high, sending forth many side-branches, forming a corymbus, narrow, acute-pointed, entire, alternate leaves; the branches fastigate, and every branch terminated by one blue flower, appearing in August and September.

9. *ASTER undulatus*.

Waved-leaved Aster.] Aster with branching stalks about a yard high, lower, heart-shaped, waved leaves, downy underneath; their base embracing the stalks, and small branches terminated by an ascending spike of whitish-blue flowers, appearing in August and September.

10. *ASTER ericoides.*

Heath-like Bushy Star-wort.] Aster with slender very branchy bushy stalks about three feet high, closely garnished with very narrow entire leaves, and each branch terminated by a small whitish flower, having leafy foot-stalks, appearing in September and October.

11. *ASTER cordifolia.*

Cordate Broad-leaved Aster.] Aster with slender stalks about two feet high; heart-shaped, pointed, sharply serrated, foot-stalked leaves, and the upper parts of the stalk dividing into many branches, terminated by panicles of white flowers in September.

12. *ASTER glaber.*

Smooth Peach-leaved Aster.] Aster with branching stalks about five feet high; oblong, spear-shaped, acute, serrated, smooth leaves, and all the branches dividing at top into several spreading foot-stalks, each ending in a large pale blue flower, appearing in October.

13. *ASTER rigidus.*

Stiff-leaved White Virginia Aster.] Aster with branchy stalks about three feet high, very narrow alternate leaves, and each stalk and branch terminated by one white flower, appearing in October and November.

14. *ASTER tenuifolius.*

Narrow-leaved American Aster.] Aster with branching stalks four or five feet high, very narrow entire leaves, and all the branches ending in small, whitish-blue flowers, appearing the end of October.

15. *ASTER concolor.*

Single-stalked Virginia Star-wort.] Aster with single or unbranched stalks three or four feet high; oblong-oval, entire, downy, close-fitting leaves, and each stalk terminated by a loose spike of bluish flowers, appearing about Michaelmas.

16. *ASTER divaricatus.*

Divaricated White American Aster.] Aster with stalks about two feet high, divided at top into forked diverging branches, garnished with ovate, sawed leaves, and terminated by umbellated clusters of white flowers, appearing the beginning of September.

17. *ASTER Novo-Belgicus.*

New-Holland Star-wort.] Aster with stalks about four feet high; spear-shaped, slightly-sawed, close-fitting leaves; all the stalks paniculated, and all the branches of each panicle

terminated by one blue flower, appearing the end of August.

18. *ASTER Tripolium.*

The Tripolium Aster, or Sea Star-wort.] Aster with stalks two feet high, producing unequal branches; spear-shaped, entire, fleshy, smooth leaves, and terminated by a corymbose cluster of blue flowers, in July and August.

19. *ASTER paniculatus.* — Panicked, tall, blue Aster.

20. *ASTER dumosus.* — Bushy, low, white Aster.

All these perennial Asters have fibrous very spreading perennial roots, but annual stalks, which rising annually in spring, continue their growth all summer, flower and perfect seed in autumn, and then die down to the root.

Their Culture.

They disdain no common soil of a garden, and will succeed almost any where.

Most of them produce considerable tufts of stalks, forming a large bush, which being closely covered with leaves and flowers, they make a very showy appearance, both in their general growth, and in their numerous flowers, in autumn, being the general season of flowering in most of the sorts; some flower in June, July, and August, but the greater part from August till October and November, in the different species; and the late-flowering kinds continue in full blow, very ornamentally, till the end of autumn, at a time when most other flowers are decayed; so that they are very eligible for common large flower-borders, and are well calculated for large open compartments, or in assemblage with common shrubs, and to adorn the boundaries of home-lawns, or the borders of walks carried round out-shrubberies, &c. observing that, as most of the taller-grown sorts will require support of stout stakes, should place one to each plant, in the centre of the stems, tying the whole round moderately close together, that they may continue in an upright growth, as they would straggle about in great irregularity, if not supported.

The propagation of all the sorts is effected with facility, by dividing their roots in autumn, winter, or spring.

The root you intend to increase from may either be taken up and divided, or with a spade separate part of it as it stands, and so divide that part into as many separate slips as it will admit of.

The smallest slip will readily grow and flower the following autumn, and in a year or two will increase to a great bunch; and some sorts spread so considerably, that it is sometimes necessary to reduce them every two or three years, either by cutting in the roots on each side, or by taking them entirely up, and divid-

ed smaller, replant a necessary supply of the best moderate-sized plants, and throw the rest away.

Most of the sorts may also be increased by cuttings of their flower-stalks in May and June in a shady border, so that if any sort afford root off-sets sparingly, recourse may be had to this method.

The green-house sort is,

ASTER Fruticosus.

Shrubby African Star-wort.] After with a shrubby stem, growing a yard high, sending out side-branches, adorned with narrow leaves, in clusters from one point, and long naked foot-stalks from the sides of the branches, each supporting one blue flower appearing early in March.

Variety.] Shrubby Aster with white flowers.

Both these varieties must always be kept in pots, in order to be wintered in a green-house.

Their propagation is by cuttings of the young branches in spring or summer, planting them in pots, which plunge in a hot-bed, just to strike the cuttings; afterwards move them to the full air during summer.

ASTRAGALUS, Milk-Vetch, including also the *Tragacantha*, or Goat's-Thorn.

This genus consists of herbaceous annual and perennial flower-plants, and some of shrubby growth, all of them adorned with winged leaves, and papilionaceous or butterfly-shaped flowers.

Class and order, *Diadelphia Decandria.*

Characters.] CALYX is monophyllous, and five-parted at top. COROLLA is papilionaceous; the standard long, erect, blunt, and reflexed on the sides; the wings and keel of equal length, and shorter than the standard. STAMINA, nine united filaments and one single, having roundish antheræ. PISTILLUM, a nearly columnar germen, subulate style, and blunt stigma. PERICARPIUM, a pod of two cells, and kidney-shaped seeds.

There are upward of sixty species; those of them principally cultivated in the English gardens are,

1. ASTRAGALUS *alopecuroides.*

Fox-tail Alpine Biennial Milk-Vetch.] Astragalus with upright hairy stalks, two feet to a yard high, ornamented with long-winged leaves, of about twenty pair of oval lobes, terminated by an odd one; and from the places of the leaves proceed large, cylindrical, close-fitting spikes, wholly covered with down, out of which appear yellow flowers, succeeded by woolly pods; flowers in June and July.

2. ASTRAGALUS *galegiformis.*

Goat's-Rue-leaved Oriental Perennial Astragalus.] Astragalus with upright smooth stalks

four feet high, adorned with long-winged leaves, of about fourteen to twenty pair of oval lobes, ending in an odd one; and from the places of the leaves, long hanging spikes of yellow flowers, in June and July, succeeded by triangular pods.

3. ASTRAGALUS *christianus.*

Great Yellow Oriental Perennial Milk-Vetch.]

Astragalus with erect stalks a yard high, large long-winged leaves, having many pair of oval lobes, ending in an odd one; and all along the stalks, from the axillæ of the leaves, proceed globular close-fitting clusters of large bright yellow flowers, appearing in July.

4. ASTRAGALUS *Cicer.*

Globular-Podded Perennial Astragalus.]

Astragalus with prostrate stalks three feet long, winged leaves, of about ten pair of small oval lobes, terminated by an odd one; and from the axillæ of the leaves grow small spikes of yellow flowers in July, succeeded by globular swollen pods.

The first of these species is a biennial plant; the other three are perennials.

They are all very hardy, and will prosper in any of the common borders, or shrubby clumps, and flower and perfect seed annually.

Their propagation is by seed. Sow it in spring in a bed or border of common earth, and the plants will soon come up; all they require is weeding till autumn, when they should be transplanted into the places where they are to remain, and they will flower next summer.

As the Fox-tail Astragalus is apt to die away after it has flowered, some plants should be raised annually.

5. ASTRAGALUS *Tragacantha.*

The Common Tragacanth Shrub, or Goat's-Thorn.] Astragalus with many shrubby, procumbent, prickly, white stalks and branches, spreading every way a foot or two in length, adorned with winged, silvery-white leaves, of six, eight, or ten pair of lobes, without an odd one, having their foot-stalks terminated by a sharp thorn; and white flowers in clusters from the sides and end of the branches, appearing in June and July; not succeeded by seeds in England—native of France and Italy.

Varieties of this are,] Goat's-thorn with oval lobes to the leaves—with spear-shaped lobes—with spear-shaped, pointed, very downy lobes—and with purple flowers, red flowers, &c.

This species and varieties retain their leaves long; and when they drop, the foot-stalks remain in form of acute thorns, and as an armature to the plants.

They succeed in the shrubberies in a warm dry situation; but as they are somewhat tender while young, some should also be kept in pots, to have occasional shelter of a frame or green-house during winter.

Their propagation may be effected easily by seed, if it can be procured, sowing it in a bed of common earth in April; but in default of seed, they may also be increased plentifully by layers; also by slips and cuttings of their young shoots in April or May, planting them in pots, which plunge in a moderate hot-bed about six weeks, giving occasional shade and water; and harden them gradually to the open air.

ASTRANTIA, Master-wort.

This genus furnishes two species of herbaceous perennials, growing from one to two feet high, ornamented with large divided leaves, and crowned by umbellate flowers.

Class and order, *Pentandria Digynia*.

Characters.] **CALYX**, the flower is umbellate, each umbel formed of four or five smaller ones: the general calyx, or involucre, consists of eight or ten leaves; that of the small umbel, of about twenty, which are long, coloured, and spreading. **COROLLA**, each umbel has many florets, each formed of five erect, bifid, incurved petals. **STAMINA**, five filaments. **PISTILLUM**, an oblong germen, inferior, two styles, and simple stigmas. **PERICARPIUM**, an ovate two-parted fruit, having two seeds.

The species of most note are,

1. **ASTRANTIA Major**.

Great Black Master-wort.] **Astrantia** with upright stalks about two feet high; many large, spreading, radical leaves, divided into five large, oval, deeply-ferrated lobes; those on the stalk trilobate and pointed, one leaf at each joint, and the top of every stalk and branch crowned by an umbel of flowers.

Varieties.] Great Master-wort, with purple flowers—with white flowers.

2. **ASTRANTIA Minor**.

Lesser Alpine Master-wort.] **Astrantia** with stalks about a foot high, digitated or fingered leaves, of seven or eight deeply-fawed segments, and all the branches terminated by umbels of white flowers.

The roots of these plants are large, fibrous, spreading, black without, and of many years' duration.

The plants are very hardy; they are considered chiefly as plants of ornament; though they effect no great figure, they however afford variety in large gardens, where it is necessary to have many plants of easy culture.

Their propagation is by seed in the common

ground, or by parting the roots, both of which may be performed any time, in open weather, from October till March.

ATHANASIA, consists principally of shrubby exotics for the green-house collection, adorned with radiated flowers.

Class and order, *Syngenesia Polygamia Æqualis*.

Characters.] **CALYX**, an ovate imbricated receptacle. **COROLLA**, uniformly composed of many equal hermaphrodite florets. **STAMINA**, five short capillary filaments, with cylindric, tubular antheræ. **PISTILLUM**, an oblong germen with a slender style, crowned with a bitid obtuse stigma. **PERICARPIUM**, none; the calyx containing the seeds, which are oblong, and separated by a chaffy down on the common receptacle.

The species for our purpose are,

1. **ATHANASIA dentata**.

Tooth-leaved Athanasia.] Rises with a shrubby branching stem about three feet high, garnished with recurved leaves, the inferior linear and dentated, the upper oval and serrated, and yellow flowers in a compound corymbus.

2. **ATHANASIA crithmifolia**.

Samphire-leaved Athanasia.] Rises with a shrubby branching stem, five or six feet high, garnished with linear semitrifid leaves, and bright yellow flowers in a simple corymbus.

3. **ATHANASIA pubescens**.

Woolly-leaved Athanasia.] Rises with a shrubby stem six or seven feet high, garnished with undivided spear-shaped villose leaves, and yellow flowers in a corymbus.

4. **ATHANASIA trifurcata**.

Trifid-leaved Athanasia.] Rises with a shrubby, irregular, branching stem, five or six feet high, garnished with glaucous, three-lobed, wedge-shaped leaves, and bright yellow flowers in a corymbus.

These species, being natives of the Cape of Good-Hope, require the protection of the green-house. They are propagated by cuttings, in June, in pots plunged in a decayed hot-bed, and covered air-tight with glasses; and in six or eight weeks will be sufficiently rooted to be planted singly, in separate pots, and inured to the open air, before they are removed to the green-house there to remain during the winter.

ATRAPHAXIS.

This genus furnishes two shrubby plants for the green-house, garnished with small simple leaves, and clusters of two-petaled flowers.

Class and order, *Hexandria Digynia*.

Characters.] **CALYX**, two permanent coloured leaves. **COROLLA**, two roundish petals.

petals. STAMINA, six capillary filaments, and roundish antheræ. PISTILLUM, a compressed germen, no style, but two capitated stigmas. PERICARPIUM, none; the single seed being inclosed in the calyx.

The species are,

1. *ATRAPHAXIS spinosa*.

Prickly Oriental Atraphaxis.] Atraphaxis with a woody stem and branches four or five feet high, armed with sharp spines; small, ovate or spear-shaped, smooth, glaucous leaves; and clusters of white flowers from the ends of the branches, appearing in August; but no seed in England.

2. *ATRAPHAXIS undulata*.

Waved-leaved Smooth African Atraphaxis.] Atraphaxis, with shrubby, trailing, unarmed stalks; garnished with small, ovate, waved, curled leaves; and greenish-white flowers at the end of the branches, appearing in June and July; but no seed in England.

These two species must always be kept in pots, to be moved to a green-house in winter.

Both the species are easily propagated by cuttings in spring and beginning of summer.

ATRIPLEX, Orache, or Arache; also the *Halimus*, or Sea-Purflane Shrub

This genus furnishes herbaceous and shrubby plants; the former are considered chiefly as esculent culinary herbs, the latter as plants of ornament, being adorned with curious silvery leaves.

Class and order, *Polygamia Monœcia*.

Characters.] Hermaphrodite and female flowers apart on the same plant. CALYX, five oval, concave, membranaceous-bordered, permanent leaves in the hermaphrodites; and two large, plane, erect, acute ones in the female flowers. COROLLA, none. STAMINA, five filaments, and double antheræ. PISTILLUM, an orbicular germen, two-parted style, and reflexed stigma. PERICARPIUM, none; the seed being lodged in the calyx.

The principal species are,

1. *ATRIPLEX hortensis*.

Garden Herbaceous Orache.] Atriplex with large triangular leaves, and when it runs to seed, shoots up erect herbaceous stalks; flowers in June and July, and ripens seed in August.

Varieties.] Garden Orache with dark-green leaves—whitish-green leaves—with purple leaves.

All these varieties are annual herbs; they were formerly much cultivated in kitchen-gardens, for culinary purposes, in the manner of spinach, and require exactly the same culture, the seeds being sown where they are to

remain, annually in spring for summer use; also in autumn, to stand the winter for spring service, hoeing the plants to four or five inches distance.

2. *ATRIPLEX Halimus*.

Halimus, or Sea-Purflane Tree.] Atriplex with a shrubby stalk, branching out widely on every side, grows four or five feet high, ornamented with white, silvery, deltoid, entire leaves, thick, succulent, placed on long petioles, remaining all the year, and effects a singularly agreeable variety at all seasons: but the small purple flowers have no beauty.

It is a maritime plant of Spain and Portugal, but succeeds here in the full ground.

3. *ATRIPLEX portulacoides*.

Common Sea-Purflane.] Atriplex with a shrubby stalk, sending out numerous wide-spreading branches, grows three or four feet high, very bushy, adorned with numerous, ovate, narrow, whitish, silvery leaves.

This is a sea-side plant in England, and is sometimes admitted in gardens.

These two shrubby Atriplexes, by their silvery-coloured leaves, effect an agreeable contrast, in assemblage with other shrubs, in any part of the pleasure-ground.

Their propagation is by cuttings planted in a shady border in spring and beginning of summer; they will readily take root, and be fit to transplant in autumn.

ATROPA, *Belladonna*, or Deadly Nightshade; and the *Mandragora*, or Mandrake.

This genus comprises two hardy herbaceous perennials, one shrubby plant for the green-house, and one annual for the stove, garnished with simple leaves, and bell-shaped flowers, cultivated in gardens more for singularity than utility or beauty.

The *Mandragora*, or Mandrake, so called from the feigned resemblance of its large, long, fleshy root to the human figure, was always ranged as a distinct genus, till Linnæus lately discovered its characters to be the same as the *Atropa*, and so ranges it as a species of that genus.

Class and order, *Pentandria Monogynia*.

Characters.] CALYX is monophyllous, swelling, acutely five-parted at top, and permanent. COROLLA is monopetalous, bell-shaped, with a short tube below, swelling, five-parted and spreading above. STAMINA, five awl-shaped filaments attached to the base of the corolla, connected below, and large assurgent antheræ. PISTILLUM, a semi-oval germen, filiform style, and oblong transverse stigma. PERICARPIUM, a globose bilocular berry, sitting on the calyx, containing kidney-shaped seeds.

The

The species are,

1. *ATROPA Belladonna.*

The Belladonna, or Deadly Nightshade.]

Atropa with herbaceous, strong, branching, purple stalks, four or five feet high, ornamented with large, oval, entire leaves, placed on short petioles: and from the axillæ of the leaves proceed many long foot-stalks, each supporting one bell-shaped, brownish-purple flower, succeeded by large shining black berries of deadly quality.

It flowers and ripens its fruit from June or July until Michaelmas.

This is a wild plant of Britain, &c. but being a robust, conspicuous perennial, is admitted in many gardens, to form variety in the pleasure-ground. It ought, however, to be disposed with great caution out of the way of children, on account of the noxious quality of the fruit, which being the size and colour of small black cherries, appear very beautiful and tempting; and taken internally, they cause a stupor, delirium, and convulsions, and without the speedy and copious use of acids, such as vinegar, juice of lemons, &c. soon prove mortal.

The fresh leaves of this plant, applied to hard tumours, and scirrhus swellings on the breast, are a certain remedy.

The propagation of this species is effected abundantly by slips or off-sets from the root in autumn or spring; also by seed in a bed of common earth, from which transplant the plants in autumn.

2. *ATROPA Mandragora.*

The Mandragora, or Mandrake Plant.]

Atropa with a very large, long, parsnep-like root; no stalk, but the root crowned with many large, pointed leaves, devoid of foot-stalks, about a foot long, almost half as broad, spreading in a circular cluster; and in the midst rise the foot-stalks of the flowers three inches long, each supporting one whitish-green flower, succeeded by large, round, yellowish berries.

It flowers in March or April, and the fruit ripens in July.

This species is very durable in root, which is said to remain sound and vigorous half a century at least.

It is retained in many curious gardens, as a plant of singularity.

Its propagation is by seed, in a bed of light earth, sown in autumn or spring, either where they are to remain, or the plants may be transplanted in autumn into different borders for variety, placing them in dry ground, where they will abide an age, increase exceedingly in magnitude, and flower and perfect seed annually.

This is supposed to be the *Mandrake* mentioned in Scripture, and the fruit is said to have vast power in procuring fruitfulness to women.

Of the root of this plant many ridiculous stories have been invented by quacks, relative to its fancied resemblance to the human form, it acquiring considerable substance in growth, and strikes three or four feet deep in the ground, dividing frequently into large, long, fleshy forks, which impostors made to resemble the legs, thighs, and arms of the human body, and shewed it about the country, advancing strange accounts of its singularity, too idle to be regarded; such as its sensation of feeling, by emitting groans at the approach of violence, and to cause instant death to him who should attempt to root it out of the ground. So greatly were these impostures palmed upon the credulous formerly, that in default of the real *Mandragora*, Mandrakes, or images, were formed of the large roots of briony, effected by opening the earth in spring about a strong-shooting young plant without disturbing the lower fibres, so fixing a figure-mould about it, then filling in the earth, and by autumn the root assumes the desired form; they also sometimes artfully carved a large root, as it grew, to a sort of resemblance, so filling in the earth again, and by the end of summer the carved parts would be crusted over, so as to hide the artifice.

3. *ATROPA frutescens.*

Shrubby Deadly Night-Shade.]

Atropa with a shrubby very branching stem, grows seven feet high, garnished with roundish-oval, alternate leaves, and foot-stalks in clusters from the wings of the leaves, supporting yellowish brown-striped flowers, which are not succeeded by berries in England. Native of Spain.

This plant must always be kept in pots, and wintered in a green-house.

It may be propagated by seeds procured from abroad, which must be sown in pots in spring, and plunged in a hot-bed, just to raise the plants.

ATROPA physaloides.

Physalis-fruited Atropa.]

Atropa, with a fibrous annual root, erect spreading herbaceous stalk, with angular branches extending two feet, garnished with sinuated angular smooth leaves placed alternate; the flowers are large and of a blue colour, they come out singly on peduncles, from the axilla of the leaves, and are succeeded by dry globose berries, having three or four cells.

This plant must be kept in the stove, and is propagated by seeds sown on a hot-bed in the spring, and afterwards pricked out singly into

into pots, and plunged in the bark-bed, and in July and August will produce its beautiful flowers.

AUCUBA, a genus of monœcious evergreen shrubs, having male and female flowers separate on the same plant.

Class and order, *Monœcia Tetrandria*.

Characters.] CALYX, monophyllous, truncated, and slightly four-parted at top. COROLLA, four oval acute spreading petals, concave below and convex above. STAMINA, four erect very short filaments, topped with oval, twin antheræ. PISTILLUM in the female flowers, a germin placed below, crowned with a thick, short style, and topped with a capitated stigma. PERICARPIUM, an oval unilocular nut.

We know but one species, viz.

AUCUBA japonica.

Japan Aucuba.] Rises a large tree, with spreading dichotomous branches, garnished with large, oval, spear-shaped nervous leaves, beautifully spotted over with gold-coloured dots; the flowers terminate the branches in panicles, and are of a brown colour and small.

Varieties.] With dark unspotted leaves—with bright-green leaves spotted with white.

This tree, for the beauty of its large maculated foliage, is highly deserving a place in every elegant garden, and though it has commonly been retained in the green-house in winter, yet may, with advantage of growth, be planted in the common ground, among other shrubs, in a well-sheltered situation, if screened from cutting winds, without receiving any damage from frosts.

This plant is propagated by laying down the branches in the spring, or by cuttings, with the assistance of a moderate hot-bed, as other plants of the same nature.

AVENUES. In gardening, Avenues are considered to be large straight walks, bounded on each side with one or two rows of noble forest trees, designed sometimes as a principal way from the common road to the mansion of a country seat, and often to form views, or to lead to different districts.

Regular Avenues, about extensive seats, detached in parks, &c. always exhibit an air of grandeur, though I should advise to have the principal front of the mansion entirely open, or unincumbered with these or any kind of plantation; for it is a great absurdity to hide a good front, and obstruct the prospect: no avenue can therefore be admitted with propriety in that part of the ground. A spacious lawn of grass should always be exhibited in due extension in the most conspicuous fronts of the dwelling. See LAWNS. But in a di-

rection from the wings, detached at some considerable distance, Avenues might with more propriety be introduced and extended on each side of spacious lawns, serving by way of boundary, and backed up next the lawn with shrubs and lower trees, disposed irregularly: and if the Avenues are carried in an oblique direction, the lawn will widen gradually, and the prospect will be more comprehensive: or Avenues might be admitted at some distance from either end or back front of the dwelling; in either of which situations an Avenue may be extended towards any common road, village, or town, one or more serving as the common entrance or Avenue leading to the habitation, others by way of ornament, &c. and in extensive situations, Avenues might occupy different parts at a distance directed towards woods, groves, or edifices, and particular districts about an estate, which, when of considerable width, and bounded on each side with the noblest progeny of the forest, give an air of dignity to the site.

These Avenues should be planted with the stateliest trees; and an assemblage of different sorts effects the more agreeable variety.

The width of the Avenue should never be less than sixty feet; but when it is to be extended any considerable length, a hundred feet wide is not too much, especially when we consider that as the trees grow up, the branches on the opposite sides continue to approach each other, which by degrees greatly contract the view, so that if a considerable width is not at first adopted, the Avenue would in time appear very narrow and trifling.

The trees in the rows on each side should be planted thirty feet distance at least, that the different trees may have full scope to display their heads, and each sort exhibit itself conspicuously, according to its own natural form.

The sorts of trees proper for Avenues are of the deciduous tribe; the elm, lime, platanus, beech, chestnut, horse-chestnut, abele-tree, or white poplar, sycamore, Norway maple, Virginia maple, walnut-tree, wild cherry-tree, &c. all of which are of lofty growth; and an assemblage of all, or part, will have a fine effect disposed in Avenues.

Sometimes evergreen trees are used for Avenues: where this is intended, the most proper sorts are various species of the *Pinus*, or pine-tree, including all the sorts of firs, most of which attain a great height and magnitude, with beautiful spreading heads, and are extremely ornamental.

Rural Avenues, as common ways or roads through a park, &c. to a habitation, may be contrived either in a direct line, or carried round

round in a moderate sweep, or the course directed in two, three, or more, very gentle bends, or easy serpentine turns, each side ornamented with different sorts of trees, thinly dispersed in a rural taste; that is, some placed singly, others in groupes of two, three, or more together, exhibiting them variously, some breaking forward, others standing more back; and for the greater diversity, may introduce here and there a clump of tall flowering shrubs, having the whole, the single trees, groupes, and clumps, so considerably detached, as to admit of a full prospect of the adjacent lawns, fields, or plantations, during the whole excursion of the Avenue.

The trees that form any sort of Avenue, whether deciduous or evergreen, should all be permitted to take their own natural growth.

AVICENNIA, this genus comprises a woody tree for the stove, adorned with ringent monopetalous flowers.

Class and order, *Didymia Angiospermia*.

Characters.] **CALYX**, a five-parted permanent cup. **COROLLA**, monopetalous tube, short and bell-shaped, border bilabiate, upper lip square and emarginated, and the under one trifid. **STAMINA**, four subulate filaments, two longer than the others, and roundish twin antheræ. **PISTILLUM**, an ovate germen, erect, awl-shaped style, and bifid, acute stigma. **PERICARPIMUM**, a coriaceous rhomboidal compressed capsule of one cell, containing a large seed.

There are three species of this genus, one of which we shall notice.

AVICENNIA tomentosa.

Downy Avicennia.] Rises a tree fourteen or sixteen feet high, with small declining branches, the lower ones rooting where they touch the moist earth, and the upper ones garnished with thick, cordate, oval, smooth leaves, downy underneath, about two inches long and one broad, placed opposite; and from the top of the branches, spikes of white flowers.

This tree is supposed to be the mangrove; it must be constantly kept in the stove, and is propagated by cuttings, with the assistance of a hot-bed in the spring.

AURANTIUM, the Orange-tree. See **CITRUS**.

AURICULA Urss, Bear's-ear, or Auricula. See **PRIMULA**.

AUTUMNAL Plants, Plants that attain perfection in autumn, many sorts in their respective mature growths; others in their time of flowering, &c.

AUTUMNAL SEASON. The Autumn season being very often mentioned in the course of this work, it may be necessary to observe,

that in regard to the numerous works directed to be done in that season, we commonly consider it to be from about the beginning or middle of August, till the latter end of November, in which period many works of sowing, planting, and propagation, &c. are successfully performed.

As for instance, many sorts of esculent plants are sown to stand the winter for next spring and summer; such as cabbage, cauliflower, carrots, lettuce, spinach, onions; and in October and November, beans, peas; planting coleworts and early cabbage-plants; likewise cauliflowers under hand and bell glasses, where they are to remain, and pricking others thick in frames, to stand till spring; planting out lettuces on warm borders, and in frames, to stand the winter; also celery in shallow trenches, for spring service; making and spawning mushroom-beds, for winter and spring use.

Many sorts of fibrous-rooted flower-plants are increased at this season, by dividing or parting their roots, particularly in the months of September, October, and November, when the flower-stems decay; and the slipped or divided parts will all flower the year following.

Likewise, from the middle of September until the middle or end of November, is a proper time to transplant from one place to another almost every kind of hardy fibrous-rooted perennials, as directed each under its proper genus.

It is also a proper time to plant all sorts of bulbous flower-roots that were taken up in summer, which being now planted, exhibit an early spring and summer bloom.

Seeds of many sorts of flowers are also now to be sown, which do not grow so freely when sown at other seasons, as expressed in their respective places in the course of the work.

In this season also, from the middle of September till the end of November, is a proper time to plant cuttings, and make layers, for the propagation of numerous hardy trees and shrubs.

Seeds of many sorts of hardy trees and shrubs are also to be sown in October and November.

The principal Autumnal planting season for all sorts of hardy trees and shrubs, both fruit, forest, and ornamental kinds, is from about the middle of October to the end of November. Many other works of garden culture are particularly necessary in autumn.

AXILLA, (Arm-pit), a botanic term, applicable to plants and trees, expressive of the angles formed by the stem and branches, at the joining of the latter to the former; and the same of the branches and shoots, and also the leaves with either; and from which angles
or

or *axillæ*, the flower, &c. are in many plants produced, which are thence denominated axillary flowers.

AZALEA, American Upright Honey-suckle.

This genus furnishes our shrubberies with two hardy, deciduous, flowering shrubs, of moderate growth, ornamented with oblong simple leaves, and funnel-shaped flowers in clusters.

Class and order, *Pentandria Monogynia*.

Characters.] **CALYX** is small, five-parted at top, coloured, and permanent. **COROLLA** is a funnel-shaped petal, having a long tube below, and divided at top into five reflexed segments. **STAMINA**, five filaments inserted into the receptacle, and simple antheræ. **PISTILLUM**, a round germen, long permanent style, and blunt stigma. **PERICARPIUM**, a roundish capsule of five cells, and numerous roundish seeds.

The species most known are,

1. *AZALEA viscosa*.

Viscous-Flowered White Azalea.] Azalea with several shrubby branching stems, rising three or four feet high, garnished with spear-shaped, narrow-based, rough-bordered leaves, in clusters towards the end of the branches, and with all the branches terminated by white, hairy, glutinous flowers, coming out between the leaves in clusters.

Varieties.] With white striped flowers—with narrow-petaled flowers—with clustered flowers.

2. *AZALEA nudiflora*.

Naked-flowered Red Azalea.] Azalea with several woody branching stems, rising seven or eight feet high, decorated with oblong-oval, smooth, entire leaves, placed alternate, and long foot-stalks proceeding from the sides of the branches, supporting clusters of large red flowers, having the longest stamina.

Varieties.] With scarlet flowers—with pale red flowers—with early white flowers—with red and white flowers—with variegated flowers.

The flowers of both these species are beautiful and fragrant, and bear some resemblance to the honey-suckle.

They flower annually in July, but never perfect seeds in England.

For purposes in gardening, both the species are well adapted for the shrubbery, and will succeed in any common soil, though they delight most in shady moist places.

As to their propagation, they not producing seed here, are commonly increased by laying the young shoots in autumn, or spring; or, as many stems or shoots generally rise from each root, some of these may be taken off with roots, and planted either in nursery rows, or where they are to remain.

The seeds of both sorts are also often imported from America by the seedsmen, which should be sown in spring in a warm situation, or their germination may be facilitated by aid of a moderate hot-bed

B.

B A C

BACCA, a berry, defined to be a pulpy pericarpium, or seed-vessel, generally round or oval, without a valve, inclosing several seeds, mostly placed upon foot-stalks, within the pulp, as in the gooseberry, currant, raspberry, &c.

The berry does not naturally gape or burst for the dispersion of seeds, being designed to be performed by means of animals.

By Linnæus, not only the currant, gooseberry, raspberry, strawberry, &c. but also several other very different fruits, as the apple, pear, quince, medlar, love-apple, orange, lemon, and pine-apple, are all denominated berries.

B A C

BACCHARIS, Ploughman's Spikenard.

Of this genus are three exotic shrubs of the green-house and shrubbery, growing five or six feet high, ornamented with simple leaves and compound flowers.

Class and order, *Syngenesia Polygamia Superflua*.

Characters.] Compound flower. **CALYX** is a cylindrical, acutely scaly, general cup, containing many florets. **COROLLA**, the general flower is equal; the hermaphrodite and female florets are intermixed. **STAMINA**, five filaments in each hermaphrodite floret, and cylindrical antheræ. **PISTILLUM**, in all the

T florets

florets an oval germen, filiform style, and bifid stigma. PERICARPium, none; the seeds are one under each floret, crowned with down.

The species are,

1. *BACCHARIS iwaefolia*.

Iwa-leaved American Baccharis.] *Baccharis* with shrubby-branching stems, four or five feet high; long, spear-shaped, venose, dentate-sawed leaves; and whitish flowers from the sides and ends of the branches, in July and August.

2. *BACCHARIS neriifolia*.

Oleander-leaved African Baccharis.] *Baccharis* with shrubby stems rising six or seven feet high, branching out upward, garnished with spear-shaped stiff leaves, a little indented at top, and greenish-white flowers, in close spikes from the ends of the branches, in July and August.

3. *BACCHARIS halimifolia*.

Halimus-leaved Baccharis, or Virginia Groundsel-tree.] *Baccharis* with a shrubby-branching stem, rising seven feet high, ornamented with obovate, emarginate-dentated, glaucous-coloured leaves, continuing all the year, and many small white flowers, in September and October.

They all flower here annually, and the first and second sorts furnish seeds; but the third, flowering late, rarely produce any in England.

These three shrubs are generally considered as green-house plants; they are however so hardy as to be able to struggle with our ordinary winter in warm shrubberies, in which departments they are sometimes planted to take their chance; but as they are subject to be much cut in severe frosts, some of each sort should also be potted, in order to be housed in winter.

The propagation of all three sorts is by layers and cuttings of the young shoots, any time from March till Midsummer, in pots or the common ground, giving occasional shade and waterings, particularly the cuttings; and they will be rooted and fit to transplant into separate pots in autumn.

They may also be raised from seeds, in a bed of common earth, in March or April.

BACCIFERÆ *Plantæ*, Bacciferous, or Berry-bearing Plants, and such that have a bacca or berry, for their seed-vessel or pericarpium. See PERICARPium.

BANISTERIA, a genus of tender climbing exotics for the stove, garnished with oval leaves, and flowers growing in spikes.

Class and order, *Decandria Trigynia*.

Characters.] **CALYX**, a small five-parted cup,

with two melliferous glands under the divisions. — **COROLLA**, five orbicular, large, spreading petals, with oblong linear claws. **STAMINA**, ten small filaments joined below, and simple antheræ. **PISTILLUM**, three winged, coalesced germina, with three styles and obtuse stigmas. **PERICARPium**, three capsules, containing each a membranaceous winged seed.

The species of most note are,

1. *BANISTERIA angulosa*.

Angled Banisteria.] Rises with a climbing stalk many feet high, garnished with angulous sinuated leaves placed opposite, yellow flowers growing in long spikes from the ends of the branches, succeeded by winged seeds.

2. *BANISTERIA brachiata*.

Cross-armed Banisteria.] Rises with a climbing stalk, with cross-armed branches, garnished with sub-oval pointed leaves and flowers from the ends of the branches, growing in loose spikes, of a bright yellow turning to a red colour.

3. *BANISTERIA fulgens*.

Flame-coloured Banisteria.] Rises with slender climbing stalks five or six feet high, garnished with oval leaves, downy underneath, and brownish-yellow flowers on umbellate peduncles in a cross-armed racemus.

4. *BANISTERIA purpurea*.

Purple Banisteria.] Rises with a climbing stalk several feet high, garnished with oval leaves and lateral spikes of purple flowers.

5. *BANISTERIA laurifolia*.

Bay-leaved Banisteria.] Rises with a climbing irregular stalk many feet high, garnished with stiff, oval-oblong leaves, and yellow flowers, in a terminal racemus.

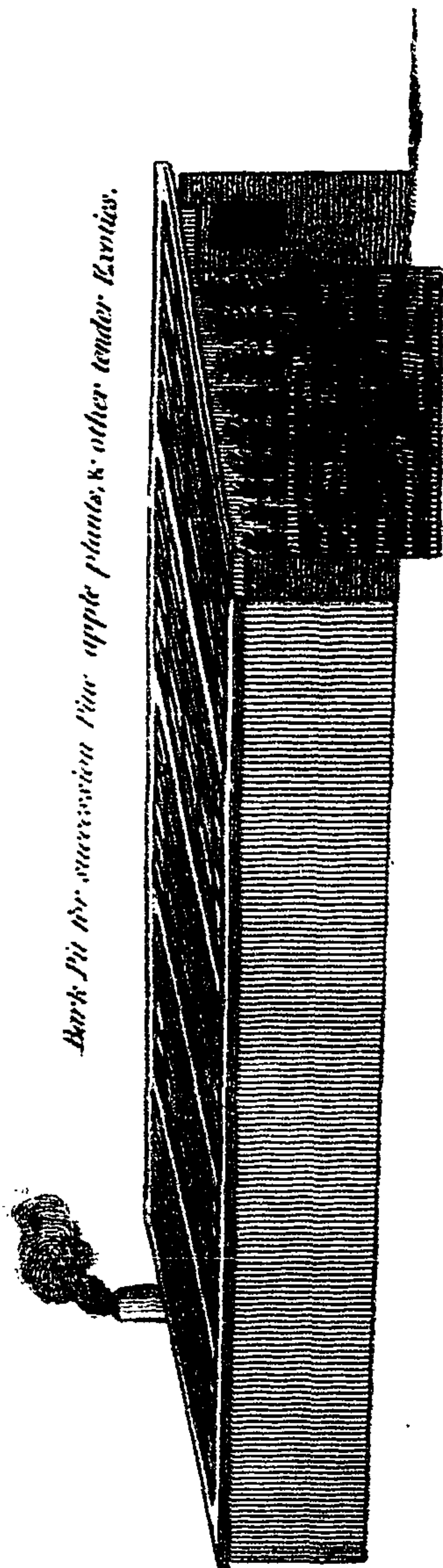
These species are all climbers for ornamenting the stove. They are propagated by seeds procured from abroad, which must be sown in pots and plunged in a bark bed: but if the plants do not come up the first year, the pots must be retained in the bed till the next, when some may appear, and when come up, must be planted separately in single pots and replunged, and afterwards managed as other climbers of the like nature.

BARBA, a Beard, alluding to bearded plants, being such whose leaves or flowers are terminated by a bunch or tuft of down, or hairs. The *Mesembryanthemum barbatum* furnishes an example.

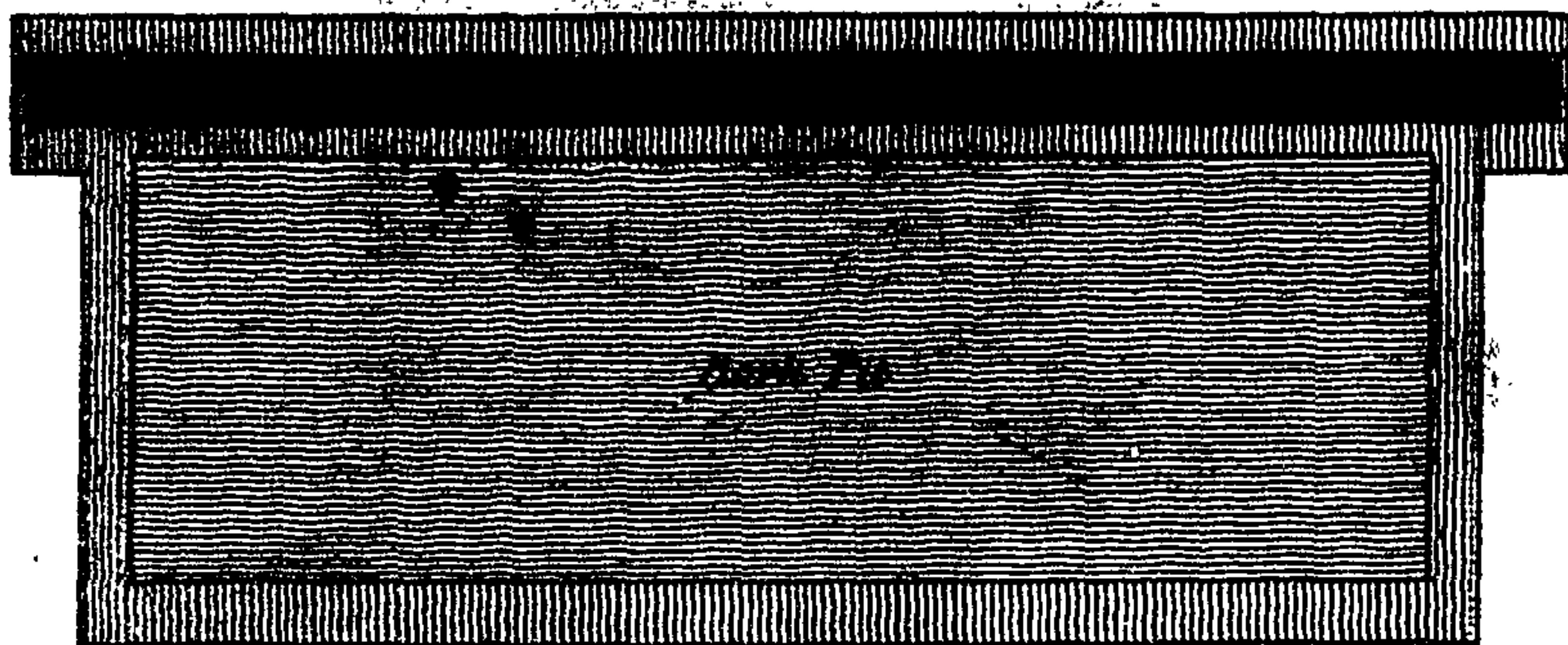
BARBATUS Flos, a bearded, gaping, or ringent flower.

A flower having two lips, the lower of which is the beard, *Barba*, and stands opposed to *Galea*, the upper-lip. Vide **COROLLA ringens**, and **GALEA**.

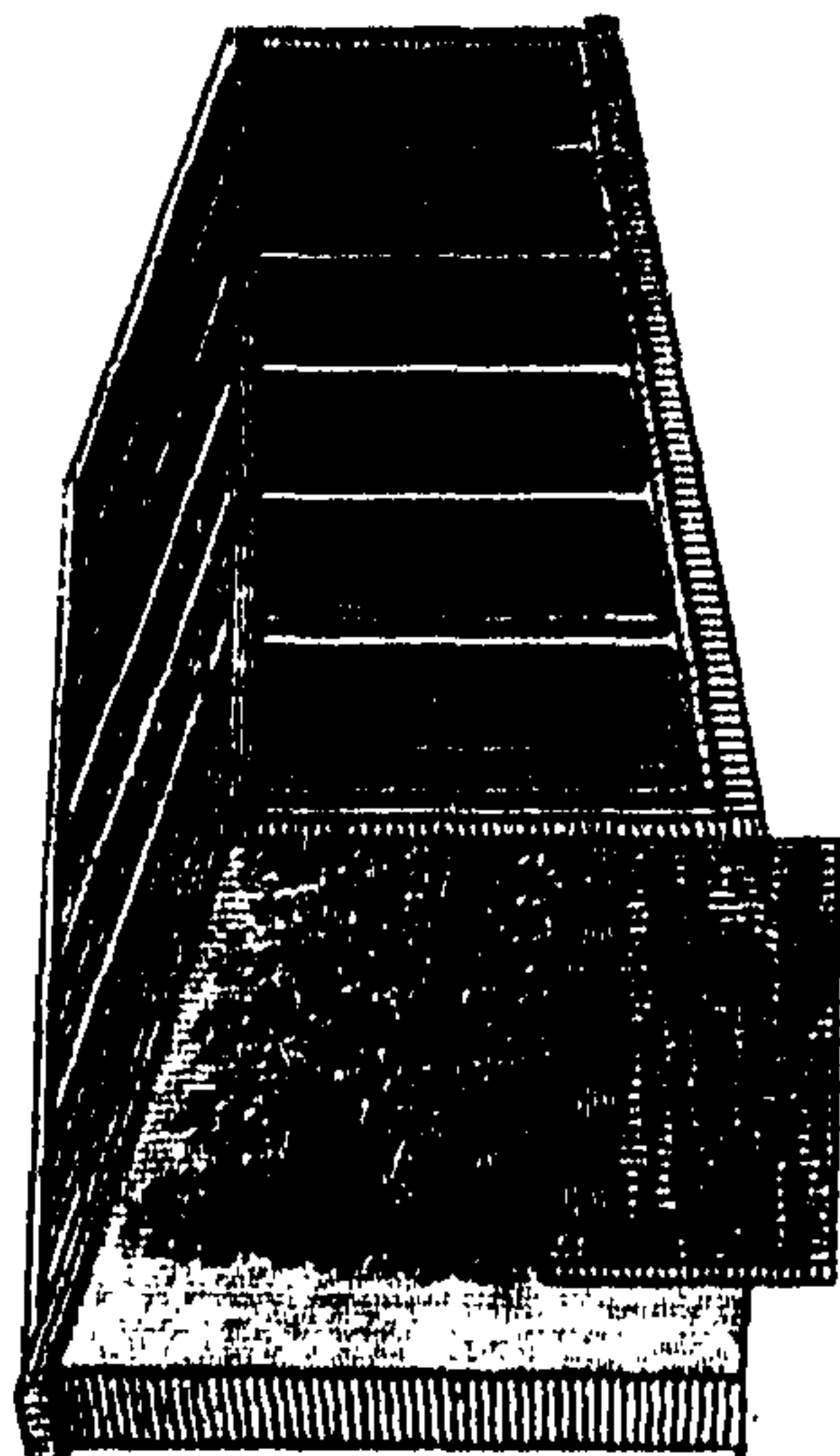
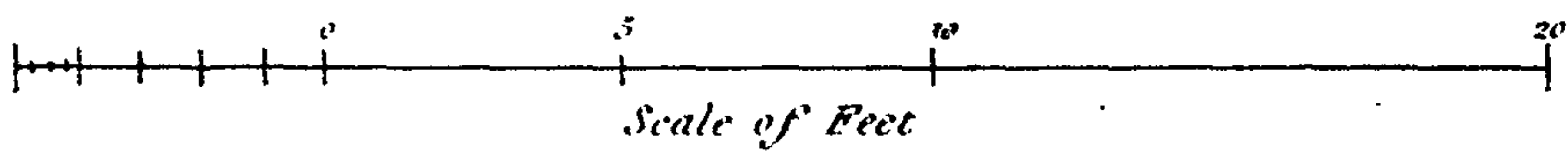
BARK or **TAN**. Tanner's bark, after being



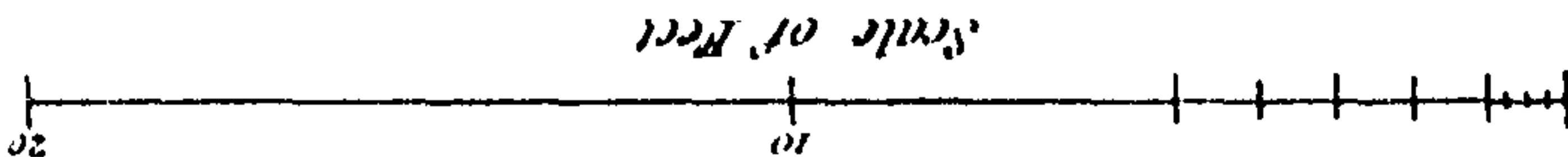
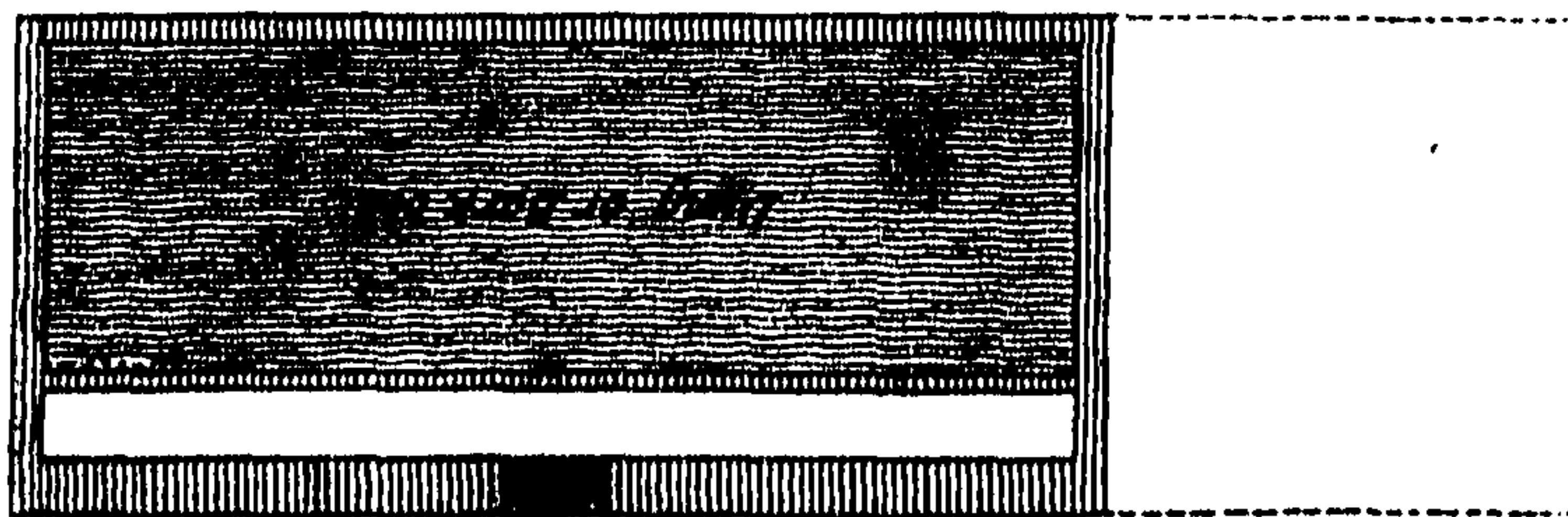
Back Pit for succession fine apple plants & other tender plants.



Ground Plan



Glass Case for Animals &c.



being used by the tanners in their tan vats, becomes a valuable material of great utility in gardening, with which to make those kind of hot-beds in stoves, &c. commonly called Bark-beds; being much more regular and durable in their temperature and continuation of a proper heat than those of dung; and are of great use in the culture of numerous sorts of tender and curious exotics, that require the aid of artificial heat in this country; for the particulars of which, see the following articles of BARK-BEDS and BARK-PITS.

BARK-BEDS, Hot-beds formed of tanner's bark, and such as support the most uniform and durable temperature of heat, and the best calculated hot-beds yet known, for the cultivation of all sorts of tender exotics from the warm parts of America, Asia, and Africa, that require the continual aid of artificial heat to maintain them in this country.

These hot-beds, with a little assistance, as hereafter directed, often support a regular temperature of heat almost a twelvemonth.

It is these bark or tan hot-beds that are universally used in hot-houses, and are called the Bark-beds; there being a cavity or pit formed within the hot-house almost its whole length, six or seven feet wide, and three deep, and walled round with brick (see BARK-PIT); and in which pit is made the bark hot-bed, the use of which is both to plunge the pots in, containing particular sorts of the more tender exotics from hot countries, that require to be continued constantly plunged therein, such as the pine-apple, &c. and at the same time to assist in warming the internal air of the hot-house or stove to a certain degree, eligible for the growth and culture of the exotic plants in general of that repository, both such as require to be retained always in the said Bark-bed, and of the others more numerous, that need only the aid of the requisite heat of the inclosed internal air aforesaid; and by the aid of which kind of hot-beds principally, with the assistance of fire-heat in winter, we are enabled to cultivate in the greatest perfection that very curious exotic perennial, the *Bromelia Ananas*, or pine-apple; also all other tender plants from every quarter of the world; for by the joint aid of these bark hot-beds, and fire heat, we are able to imitate, within the hot-house, the temperature of distant climates, so far as to raise and exhibit in health, duration, and beauty, every known plant, herbaceous, or woody, from the warmest parts of the globe, which, before the use of Bark-beds, were thought impossible to be cultivated in England.

These bark hot-beds are also made in pits

constructed in the open ground, distinct and detached from the hot-house formed by a surrounding wall, &c. raised almost wholly above ground, having a frame of wood-work at top for the support of moveable glass-lights (see BARK-PIT); and in which the tan or bark-bed being made a yard deep in tan, furnishing a peculiar kindly, lasting heat, is designed chiefly, by the assistance thereof, for propagating and raising many sorts of tender plants from seeds, suckers, layers, cuttings, &c. both of stove exotics, without encumbering the main stove or hot-house; and occasionally various plants of the green-house, as well as many of the more curious and tenderish exotics of the natural ground; and therefore is particularly useful where there are any considerable collections of tender and curious exotic plants, both for the above-mentioned occasions, and for raising and continuing various sorts in young growth for a certain time; and of great utility as nursery-pits for young pine-apple plants for the annual supply of the main stove, or pinery, to which, when of two years' growth, they are removed finally to remain to produce their fruit.—See BARK-PIT and STOVE.

Bark-beds are also very successfully used on various other occasions, especially in raising early productions; such as early strawberries, and good crops of melons, which, by the regular, durable, and moderate heat of these kind of hot-beds, are generally raised in very great perfection; are likewise occasionally adopted in raising small crops of early peas, and kidney-beans, &c. also in forcing many sorts of desirable flowers to an early bloom, both of the bulbous, tuberous and fibrous-rooted kinds; such as hyacinths, dwarf-tulips, narcissus, jonquils, anemones, ranunculuses, pinks, &c. and of several small shrubby kinds, such as roses, hypericums, and some others of similar moderate growth.

These kind of hot-beds are also used with great success in forcing-frames, for the production of early fruit, such as apricots, peaches, grapes, &c. See FORCING-FRAMES and HOT-WALLS.

Hot-beds made of this material are considerably more regular and durable in heat than those of dung, and not, like them, liable to injure plants by steam; but as horse-stable dung, for general hot-bed work, is both more readily attained every where, and at a cheaper rate, and the most conveniently eligible for common hot-beds, it is generally more commonly adopted for that occasion. The Bark-beds, however, for the particular principal purposes above mentioned, are greatly su-

perior, in being more essentially effectual by their peculiar kindly continuance of heat; and in respect to duration, they commonly maintain a due temperature of heat almost a year, with the assistance of forking or turning over two or three times, together with the addition, each time, of about one third part of new tan; but they must be entirely renewed every autumn or spring, as hereafter directed.

This article, tanner's bark, of which these hot-beds are made, is the bark of the oak-tree, chopped or ground to pieces for the use of the tanners, which, after being used by them in their tan-vats, is fit for the gardeners' purpose, wherewith to make hot-beds; for which there being now a general demand all over the kingdom, the tanners are careful to preserve proper supplies to sell for that occasion, and where it may be obtained at all seasons of the year, as may be required.

In the choice of the bark or tan, observe there are different sorts, such as the large or coarse, the middling, and the small sort, which last is the worst of all; the large sort is longest before it heats, and the heat is apt to be violent at first, though of the longest duration; the middle-sized sort heats moderately soon, and regular, seldom very violent, and is pretty durable; the small sort heats the soonest of any, though more weak, and soon becomes earthy, whereby its fermenting property is soon exhausted, and should never be used alone, where any other can be possibly procured; this sort however is now very common in the tan-yards, for the tanners find a considerable advantage for their use by grinding the bark small, because it goes the farthest.

Therefore where there is choice, the middle-sized sort is to be preferred, or a mixture of this and the large, and but as little of the small as possible.

Likewise observe to procure such that is fresh, i. e. that has been about a week or fortnight, or at most not more than three weeks or a month out of the tan pit, rejecting such as has lain so long as to have become black and earthy.

When the tan is brought home, if it is very wet, it is eligible, previous to forming it into a bed, to dispose it in small heaps or little narrow ridges for two or three days, or till it is drained of the redundant moisture, which would greatly retard its regular fermentation.

The time of year to make these beds is principally in autumn and spring. In hot-houses, for pine-apple plants, &c. they are commonly made in September or October, to have a good heat during winter; but when they are required for the purpose of raising

tender exotics from seed or cuttings, &c. or for forcing any early productions either of the kitchen garden, or of fruits and flowers, they are generally made in the spring, January or February, or March; though they may also be made occasionally at almost any season of the year, according as may be required for particular purposes.

The dimensions of the bed are to be the width and length of the pit in which it is made, and a yard deep.

In making the Bark-bed, the tan is to be thrown into the pit prepared for its reception, as before observed; and a hand or two beginning at one end, work the whole up regularly with the tan-fork to the bottom, carrying the bed to its full width and depth on before you; for it is not proper to tread much upon the bark when formed into a bed, which would render it too compact, and prevent its regular fermentation; raising the whole three or four inches higher than the top frame or coping of the wall of the pit, in the stove or hot-house, &c. wherein the bed is made, to allow for settling; or if in a detached external pit, making the bed full three feet, or three and a half depth in tan, allowing for settling as above.

As soon as the bed is made, thrust two or three long sticks into the bark in different parts, to draw up occasionally to feel their lower end, to inform you of the temperature of the heat.

In a fortnight, or perhaps in a little more or less time, the bed will be arrived at a due temperature of heat for the reception of the plants, of which you are to judge by the above-mentioned sticks, observing, if it is intended for pines, or any other plants in pots; they are to be plunged immediately into the bark, there being no occasion for earth thereon, as in dung hot-beds; and when you proceed to plunge them, it is eligible to lay a board across to stand or kneel upon, to prevent treading the bark too close; likewise having regard, if the heat is apparently violent, to plunge the pots only half way, less or more, as you shall judge necessary to preserve the roots of the plants from being scorched; and when the vehement heat subsides, plunge them down to their rims.

The bed being thus made, it will retain its first heat a quarter of a year at least, when if, by the trying sticks, you find it upon the decline, it is to be revived by stirring up, or turning over the bark, which, if of the large or middle-sized sort, will probably not at this time require any augmentation of fresh tan. Previous to the turning, first take up all the pots, then beginning at one end, fork up the

the bark quite to the bottom, breaking the lumps, and turn the whole over, and directly plunge the pots as before; this operation will renew the heat, and support it in a proper temperature two or three months longer, when the same work of turning, with the addition of about one third part of fresh tan, is necessary, blending the whole together, continuing to repeat the same operation of turning as often as you shall find the heat decline; about twice or thrice in the course of the year is sufficient.

It is always necessary, in March or April, to add about one third, at least, of fresh tan, previously clearing out all the most crumbly or earthy old stuff at top and next the outside, then throwing in as much new as will fill up the pit, fork the whole up neatly, old and new together.

Every autumn, in September or October, it is proper to renew entirely the bed in the hot-house and bark pits; for after it has been made ten or twelve months, the bark will be greatly exhausted both in heat and substance, so as to become earthy, which, at the time you intend to make the new bed, should be previously screened, and all that passes through the screen to be cleared away; so adding to the remaining old, as much new tan as will fill up the pit, then working the whole regularly together with the fork (see HOT-HOUSE). But where the whole of the old tan is very earthy, it is proper to clear it out entirely, and make the bed wholly of new materials.

BARK-PIT. A capacious oblong cavity, a yard deep, or little more, appertaining to a hot house, or stove, &c. both internal, and detached externally, in which to make a tan or bark hot-bed, commonly called a bark-bed; being in dimensions four, five, or six feet wide, or more, the length in proportion to that of the hot-house, &c. or in a detached pit, as may be required; each formed by a low surrounding brick wall, a yard high, in the internal pits; and the external three or four feet in front, by four or five in the back wall; and which different sorts of pits are indispensably necessary where bark-beds are intended, wherein to make the said beds; as the short loose nature of the tan-bark would not admit of being formed into a compact regular bed, without the aid of such kind of inclosed pits suited to that occasion, whereby to confine the tan close together within the limited bounds requisite in the formation of the bed in its proper dimensions and continued regularity.

For this purpose Bark-pits are necessary in all hot-houses or stoves, and occasionally forcing-houses, &c. And detached Bark-pits,

distinct from the hot-house, are likewise very usefully necessary in all principal gardens on many occasions, being of great utility in the culture of many sorts of tender exotics, and in raising many sorts in the different methods of propagation, and for raising and nursing similar kinds in their young growth; also occasionally for forcing and raising early productions of several sorts of hardy plants in the best perfection.

But as there are different kinds of Bark-pits, shall give some general intimations of each separately, and their principal respective uses, comprising—Hot-house, or stove, and forcing-house Bark-pits, made wholly internal, or within these departments, one pit in each, extending long-ways, in width and length proportioned to the extent thereof, and of the requisite depth, formed, each by its proper surrounding wall, equally about a yard high:—Detached, or external bark-pits, erected entirely external, distinct or separate from the stove or hot-house, four, five, or six feet wide, by any length required, raised three or four feet in the front, and a foot or more higher in the back-wall, and furnished with proper glass-lights appropriated thereto, fitted to the top in a sloping manner:—each as follows.

The Bark-pit of a hot-house or stove, and forcing-house, &c. is an essentially necessary interior compartment therein; and which, as before intimated, being the internal cavity wherein the tan or bark hot-bed is made, extending long-ways, and occupying almost the whole bottom space of the house, except about two feet on each side and ends, for an alley or walk all round, between the outward wall and that of the pit, which should be but very little sunk below the general surface of the floor of the surrounding walk, and formed by a thin wall of brick-work, generally raised, the greater part, above the surface three feet high, the bottom paved with brick or stone, &c. and in which the bark-bed being made the whole width, length and depth, serves both wherein to plunge the pots of the more tender exotics, such as the pine-apple, &c. to receive the kindly moist heat thereof immediately about their roots; and at the same time diffuses a peculiar beneficial warm vapour, for heating the internal air, assisted by fire-heat in the fires in winter; but sufficient alone in summer and autumn, from May till October, producing an effectual temperature of internal heat, for the preservation and growth of the various kinds of tender exotic residents of the stove, natives of many different parts of the hot regions of South America, Asia and Africa. See BARK-BED, and HOT-HOUSE or STOVE.

Generally

Generally most hot-houses or stoves, of the common width, have only one pit, extending lengthways thereof, as above; or if the hot-house, &c. is of considerable extent in length, the pit is sometimes divided across the middle by an intervening passage, to render it more convenient in performing the necessary culture of the resident plants in general.

But some hot-houses, of a very capacious width, have two internal Bark-pits, ranging parallel longways, with an alley or passage extending between them, which renders it more commodious in giving the requisite culture to the plants that are plunged in the bark-bed, such as the pine apples particularly, than if the whole was in one extremely wide pit, in which it would often be very inconvenient to come at the plants placed towards the middle part thereof; so that two parallel pits, of four or five feet wide each, would be more eligible than one of eight or ten feet, and by having an intervening passage, gives a larger scope of room and current of air, beneficially for the prosperous growth of the plants in the bark-beds, as well as admits of viewing them to greater advantage.

However, observing, as before intimated, respecting the formation of the internal Bark-pits in general, of hot-houses, and forcing-houses, &c. they in dimensions, in width and length, must be proportioned to that of these different departments, generally occupying the greater part of the bottom space thereof, making an allowance for a walk or passage all round, as before intimated, and should not be much sunk at bottom, forming the width, length and depth of the cavity by a thin wall of brick-work, on each side and both ends, raising it about a yard high, and this to have a timber-plate or coping framed along upon the top to secure the brick-work more effectually.

The detached or external Bark-pits, different and distinct from the foregoing, are exterior erections, separate and detached from the hot-house or stove, but in a manner connected with; or appertaining thereto, on many occasions, and useful for various other purposes, where occasional artificial heat is wanted; and are in dimensions four, five, or six feet wide, length as may be required; formed by a surrounding wall of brick-work, three or four feet high in the front, by four, five, or six behind, where sometimes flues for winter fire-heat are erected in the upper part: the whole covered at top with moveable glass frames, sloping southward to the full sun; and in which a bark-bed being made the whole width and length, and three feet deep, serves as a useful appendage to the stove, by assist-

ing in the culture of various tender exotics of that repository, especially by way of nursery-pit for raising and nursing many sorts to some advanced state of growth; also occasionally in the propagation and raising many of the tenderer kinds of green-house plants, or any particular, curious, or tenderest exotics of the full ground, as being always ready, in a continuing growing heat, wherein to plunge the pots of different sorts of plants for these occasions, where artificial heat is required, or essentially necessary in raising such tender plants more effectually and expeditious; and therefore these kinds of bark-pits prove exceedingly useful in raising any sorts of tender exotics from seed, suckers, cuttings, slips, &c. and in retaining and forwarding them in growth for some time, more or less, as may be required; and a Bark-pit, of the same kind, is particularly useful and necessary in the culture of young ananas, or pine-apple plants, in rearing and nursing them till of a proper age and size, to be placed in the succession-house, or fruiting-stove or pinery. See *BROMELIA Ananas*, or *PINE APPLE, STOVE*, &c.

Likewise, a similar kind of detached Bark-pit is occasionally used very beneficially in the work of planting, transplanting, or shifting tender or curious plants in pots, by plunging the pots which contain them, as soon as planted, into the bark-bed, which expedites their striking fresh root, and runs them off a little at first in a free growth.

And a Bark-pit, of the same kind, may be employed successfully in the work of forcing or raising early productions, such as melons, kidney-beans, peas, strawberries, &c. also many sorts of flowers, both of the bulbous-rooted and other herbaceous kinds, and small flowering shrubs. And if the dimensions were more capacious in height, especially in the back part, might have several sorts of dwarf fruit-trees, in pots, for the production of early fruit. See *FORCING-FRAME*.

These detached Bark-Pits should be erected in a warm, dry situation, in a southerly aspect, and always ranged longways, east and west, or nearly in that direction; whereby to have the whole front incline fully to the south sun in a sloping manner, on which to place the glasses in the same position; and stationed generally, either contiguous to the hot house or stove, at some proper distance in front thereof, or as the situation or convenience of the place may admit, or erected at one or both ends extending in a line therewith, but generally separated by a passage between.

But some detached Bark-pits are formed with a ridged top, like the roof of an house, the

the glasses sloping to both sides, and generally ranged longways south and north, in order to have the benefit of the sun equally on both sides; and which is used for the same purposes as the others; though principally the common south-fronting pits, extending east and west, are more generally adopted, less expensive in glass-work, &c. and commonly more successful for general purposes of this kind.

They should be constructed most commonly with a wall of brick-work as formerly hinted, forming the upright sides and ends, nine inches thick at least; and where fire-flues are intended, the back wall must be erected accordingly of proper thickness from the bottom to admit of having flues in the upper part, as before observed; a fire-place being constructed externally at the bottom at one end; or in considerably extended pits, may have a double fire-place in the middle behind, or one at each end, either end-ways or in the back part, as may be convenient.

But some detached pits are formed of wood-work by post and planking, serving for particular occasions, by bark-bed heat only, where no fire-heat is required, as no flues for that occasion can be admitted in such kind of pits; or however, where additional heat is occasionally necessary, it is effected by applying a strong lining of hot dung to the outside, and by which a good constant heat may be supported; and in such a Bark-pit, sometimes, the younger pine-apple plants are deposited and nursed for the first year, or occasionally used for other purposes of propagating, raising, and nursing tender plants, in spring, summer, &c. or sometimes for forcing early esculent crops, flowers, &c.

However the principal detached Bark-pits should generally be formed with brick-work walls, as being both the most effectually successful in general occasions, and of the greatest duration.

Respecting the general dimensions and formation, they in length may be from ten or twenty, to forty or fifty feet, by four or five to six feet wide, or but little more, as before suggested; the bottom but moderately sunk in case of much wet or great damps in the ground, which might check the progress of the proper heat below in the bark-bed: raising the surrounding wall quite from the bottom, three or four feet in front, and four to five or six in the back, forming both ends in proportion, corresponding with the front and back walls: and if intended to have one or two returns of flues for occasional fire-heat in winter, should be careful to erect them wholly above where the

bark-bed may reach in height, both that they may have full liberty to disperse their whole heat to warm the internal air only, and that they may not touch the bark, as the heat of the flues immediately close thereto would dry and exhaust its peculiar moist-heating property, and might be in danger of setting it on fire; but, observing these precautions, the flues would be of much utility in severe winter weather, whereby to give aid of fire-heat occasionally: so that according to these intimations, in the formation of the walls, &c. raising them regularly in the order as above, to the proper height before and behind, to give a gentle slope from the back to the front, a plate of timber must then be framed closely along upon the top, and strong cross-bars of wood mortised therein, from the back to the front, three feet and a half asunder, for the support of the glass lights, of proportionable width, made to slide up and down, and to draw off and on as occasion may require.

But some detached Bark-pits of brick-work being constructed without any flues for fire-heat, worked entirely by bark-bed heat only, they answer the purpose eligibly on many occasions, both in the culture of various sorts of tender plants, especially as a nursery-pit; and for raising tender exotics from seed, cuttings, suckers, &c. in spring, summer, and autumn; and also for the occasional culture in planting and transplanting of tender and curious plants, in pots, to accelerate their striking fresh root, and run them off a little at first in a free growth: likewise in forcing some early productions, both of several desirable esculent plants, and curious flowers, &c. in the earliest season.

In the different sorts of Bark-pits the bark-beds are made in autumn, winter, and spring, occasionally: but generally in hot-houses, for the culture of pine-apples, &c. they are most commonly made in the autumnal season, about September or October: and in forcing-houses are made principally in January and February: others in detached pits for raising tender plants from seeds, cuttings, &c. and for forcing particular sorts of esculents and flowers, are made in February, March, and April, as occasion may require; and in all of which the bark-bed is made the whole length and width, and about a yard or three feet and half depth in tan, which continues its heat several months, and when it begins to decline, is revived by forking it over occasionally, and sometimes applying a small addition of fresh tan, as directed under the article BARK-BEDS.

BARLERIA. It contains several tender herbaceous and shrubby plants, having simple, oblong,

oblong, or oval leaves, and didynamious funnel-shaped flowers.

Class and order, *Didynamia Angiospermia*.

Characters.] CALYX, a five-parted persistent cup. COROLLA, monopetalous, funnel-shaped, with the border deeply cut into five subequal segments. STAMINA, four slender filaments, two of which are long, and two very short, topped with oblong antheræ. PISTILLUM, an ovate germen, style slender, and bifid stigma. PERICARPIUM, a compressed, quadrangular, pointed capsule, opening elastically with two valves, containing two compressed roundish seeds.

There are several species of this genus: the principal are,

1. *BARLERIA solanifolia*.

Solanum-leaved Barleria.] Rises six or seven feet high, branching out laterally, garnished with spear-shaped, indented leaves, and axillary spines, with blue flowers from the wings of the leaves.

2. *BARLERIA buxifolia*.

Box-leaved Barleria.] Rises four or five feet high, having square stalks, with opposite, axillary, solitary thorns, and round entire leaves, with flowers growing in whorls.

3. *BARLERIA Prionitis*.

Prionite Barleria.] Rises four or five feet high, with fourfold axillary thorns, branching out, and garnished with oval entire leaves, and pale-coloured flowers.

4. *BARLERIA longifolia*.

Long-leaved Barleria.] Rises four or five feet high, with thorns growing in whorls, very long, rough, sword-shaped leaves, and blue flowers.

5. *BARLERIA coccinea*.

Scarlet Barleria.] Rises with slender stems, without thorns, seven or eight feet high, garnished with opposite, oval-pointed, indented leaves, and from the joints of the branches, scarlet flowers.

All these species are tender exotics for the stove; they are all perennials, excepting the fourth, which is biennial, and are propagated by cuttings; the fourth and fifth species are increased by seeds sown in a hot-bed; and when the plants are fit to remove, must be planted separately in single pots, and plunged in the bark-bed, where they are to remain for flowering.

BASELLA, Climbing Night-Shade of Malabar.

This genus contains two climbing, herbaceous, succulent, hot-house perennials, garnished with simple leaves, and monopetalous pitcher-shaped flowers.

Class and order, *Pentandria Trigynia*.

Characters.] CALYX, none. COROLLA, pitcher-shaped, fleshy at the base, six or seven-parted at top, and converging. STAMINA, five filaments attached to the corolla. PISTILLUM, a globular germen, three slender styles, with oblong stigmas. PERICARPIUM, the permanent corolla assumes the appearance of a fleshy berry, inclosing one seed.

The species are,

1. *BASELLA rubra*.

Red Malabar Night-Shade.] Basella with climbing, strong, succulent, deep purple, herbaceous stalks and branches, mounting, upon any support, eight or ten feet high, adorned with heart-shaped, succulent, purple leaves, and foot-stalks from the sides and ends of the branches, supporting reddish flowers.

2. *BASELLA alba*.

White Small Malabar Night-Shade.] Basella with climbing, small, succulent, very branchy green stalks; oblong-oval, waved, flaccid leaves; and long foot-stalks from the sides of the branches, supporting white flowers.

Variety.] White Basella with small purple stalks, and variegated leaves.

The flowers of both species appear from June till October, and are succeeded by plenty of seeds.

The plants are preserved here in stoves, more for singularity than beauty.

They are propagated either by seed in a hot-bed in spring, or by cuttings in pots of dry light earth, plunged in the bark-bed in the stove, or any other hot-bed, moving the plants afterwards to the stove, and allow them support.

BASKETS. Garden baskets, of different kinds and sizes, are very usefully necessary for gathering the numerous and various productions of herbs, plants, roots, fruits, flowers, &c. and for various other purposes in many occasional works of gardening.

A proper set of good baskets, more or less, being indispensably necessary requisites in every principal garden, for almost daily use, in gathering the produce, and many other needful occasions, as above suggested, they should be provided accordingly of different sorts and sizes, to contain in quantity, from about a quarter or half a peck measure, gradually up to a half-bushel and bushel, or more, suitable for the different purposes for which they are in most gardens daily wanted, especially in the business of gathering the different sorts of vegetables requisite for the supply of a family, &c. of herbs, plants, roots, fruits, flowers, and other productions, from the smallest articles, to those of largest growth, according to their respective sorts; and occasionally for many

many other useful purposes in the different garden districts, both of kitchen gardens and pleasure-grounds, &c.

To suit those different purposes, garden-baskets are of different forms; smaller sorts, flat and shallow, of different sizes, mostly without handles; others of the smaller sorts are deeper, either rounding or flat-bottomed; some with a small cross-handle, others without, for different occasions; and larger kinds, wider and deeper, some flat-bottomed, others, rounding, and generally furnished with handles; some with two small opposite handles at top, others with a bow-cross handle.

For instance, for the purpose of gathering the different products of the kitchen-garden, it would be convenient to have several different sizes of baskets, smaller and larger, adapted to that of the several sorts of vegetable productions, to contain in quantity less or more, according to their nature of growth and respective uses, for particular or more general domestic occasions, as may be required.

Such as for gathering many sorts of smaller articles, as the several kinds of salad-herbs, soup-herbs, and various other similar productions, required only in small or moderate quantities at a time, it would be proper to have a regular set in different sizes, of smaller, round, shallow, chip, or olier baskets, of from about eight or ten, to fifteen or eighteen inches wide, by two or three, to five or six inches deep, or but little more; and the smaller or shallower kinds may either be mostly without handles, or those of larger deeper dimensions, may have a bow-cross handle, or some without, as may be thought convenient for different purposes. And being thus furnished with a proper set of smaller baskets, in different sizes, as above, they will be found very usefully convenient, suited to different and particular occasions in the business of gathering the various different sorts of herbs, small plants, roots, fruits, and other productions, of small or moderate growth, as before intimated, in quantities, less or more, according to their kinds and particular or more general uses, as may be required for the occasional supply of a family, &c.

And for gathering the larger productions of principal crops, such as cabbages, cauliflowers, coleworts, and other similar greens, the different sorts of large esculent roots, peas, beans, and the various other sorts of principal vegetable articles, as are usually required in some considerable quantity, according to their several kinds, should generally be furnished with large, strong, olier baskets, of wider

and deeper dimensions, and of different sizes, to hold from about the quantum of a peck, or half-bushel, to a bushel or more, as formerly intimated, made of a proportionable form in width and depth, wider at the top than the bottom, and generally furnished with top handles; some with a bow-handle cross-ways, others with two small opposite side handles at the top edge; or also, for this business, some of those called sieve baskets would be convenient on many occasions: they are of a squat make or form, equally as wide at the bottom as the top, ten or twelve to fifteen or eighteen inches wide, by eight or ten to twelve inches deep, without handles.

Likewise baskets of the above larger kinds, in dimensions just mentioned, are also exceedingly useful for various other occasions in gardens, in carrying, removing, and containing particular articles; such as in the work of planting and transplanting, baskets are very convenient wherein to contain and carry the respective sorts of plants, roots, sets, &c. to the allotted places for that purpose; likewise similar kinds of baskets are very useful in the business of hand-weeding in walks, beds, borders, &c. to contain and carry off the weeds; as also for removing collected heaps of weeds, litter and rubbish, from the same compartments; especially where a wheel-barrow cannot be conveniently admitted or employed for that occasion; and for various other needful works in gardening, as before observed.

Also for gathering and containing different sorts of fruit, several different-sized baskets, as above are necessary; having some small, neat, shallow kinds, in which to gather the smaller, and any particular choice and more delicate fruits, for the daily supply of a family, or as may be wanted; and others of larger dimensions, for gathering more considerable quantities of the common hardier fruits.

Generally, of fruit baskets, where there are collections of different fruits, should have some of proper sizes adapted for smaller and larger kinds; such as for gathering the daily supplies of the several sorts of small fruits for a family, &c. as cherries, strawberries, raspberries, mulberries, gooseberries, currants, grapes, &c. a regular set in several sizes, of small round, white chip or neat olier baskets, would be proper; six or eight, to ten or twelve inches wide, and three or four to five or six inches deep, would be more eligible than larger sizes, and in which might occasionally gather some of the above different sorts in separate baskets, and these placed together in a larger wide flat basket in which to carry them, for the table, &c. or as may be required; and

for larger kinds of choice fruit, such as apricots, peaches, nectarines, plums, figs, pears, &c. a similar set of small baskets, as above, would also be very convenient, wherein to gather these sorts of fruits to best advantage; or sometimes to gather some particular sorts in separate smaller baskets, not so liable to bruise or blemish as might probably happen when too many are placed together in baskets of larger size: so that it would be most advisable to have some different sizes of smaller and moderate shallow baskets for this occasion, which would be more eligible than larger, both for gathering the general daily supplies of these kinds of fruit, and be convenient on particular occasions, in which to have some principal choicer sorts gathered in separate baskets, as above hinted, to send in for the immediate supply of the table; or, however, where not accommodated with a proper set of different-sized baskets for the above purposes, should have some kind of moderate-sized shallow ones of eligible dimensions in width, sufficient each to contain small portions of different sorts of fruit separate, so as not to crush one another, or might be kept separate in said baskets, by partitions of vine leaves, &c. between each sort of fruit.

And it may be proper just to observe, that, in gathering any principal or choicer sorts of the above fruits, either each sort occasionally in a separate small basket, or several sorts together, in one or more larger-sized, of a wide shallow form, and intended to be sent or carried therein, immediately to the table, &c.; it would be proper previously to line the inside of each basket with fresh vine leaves, and to place also some between the fruit, especially the larger sorts, such as apricots, peaches, nectarines, plums, pears, figs, &c. and bunches of grapes, which both preserves the beauty of the fruit, and sets it off in the best appearance.

A small sort of narrow, upright, chip baskets, called pottles, are useful for conveying some smaller sorts of ripe fruit, &c. to a distance, or to market, and for which occasion they are much used in the numerous gardens several miles round London, such as for strawberries, raspberries, mulberries, and sometimes for early cherries, gooseberries, currants, and choicer sorts of early plums, &c. as they are not so liable to bruise as when in a greater quantity together in large baskets; so that the baskets for this purpose, being of a small upright form, holding about a quart, or little more or less, are very narrow at bottom, widening upward to four or five inches at top, and furnished with a cross-handle; and these being filled with the allotted kinds of fruit, it

may be more safely carried, or sent, as may be required, without bruising. And in large quantities, intended to be sent to any distance, or for market, in these small baskets, &c. they are packed many together, upright, in a large, wide, flat osier basket, and in that manner carried upon men's and women's heads, not so liable to bruise, as by any other method of carriage.

Sieve-baskets, before mentioned, are well adapted for gathering and sending larger quantities of particular sorts of fruit, such as cherries, gooseberries, currants, grapes, plums, pears, &c. or occasionally, in the smaller sorts of these baskets, peaches, nectarines, apricots, and other kinds, each different sort of fruit generally in a separate basket. And as these kind of baskets may be obtained of two or three different sizes, from that of half a peck to half a bushel measurement, or little more or less, they are adapted to contain smaller or larger quantities of the respective sorts of fruit, as may be required; and being of equal width at bottom and top, as before observed, with the bottom a little hollowed underneath, that when intended to send the above sorts of fruit therein to any distance, they should not be filled above the brim, and covered at top, either with leaves, fern, or a little clean hay; and thus, if occasion requires to send several or many together, those of equal size may, if necessary, be placed one upon another, without fear of their pressing detrimentally upon the fruit; as in this manner hundreds are sent together by boats and other carriage to the London markets.

Or for sending the more delicate sorts of wall-fruit, as peaches, nectarines, figs, fine plums, &c. they are occasionally put up in similar-formed smaller baskets, three, four, or five inches deep, without handles; and these packed several together, in one of large deep dimensions, in which to carry them to market, or any distant place, where occasionally required.

For family use, to convey or send some considerable portions of several sorts of kitchen-garden productions, fruits, &c. to any distance, or to any family in town, should have one or more large, wide, deep, osier baskets, round or oblong, or in the manner of an hamper, and furnished with a top cover affixed thereto on one side, with a sort of withy hinge; and in which may pack several sorts of the most useful vegetables and fruits; or some principal sorts of fruit being placed in small baskets, may be packed several together in these larger, along with the other articles, more conveniently for carrying without bruising.

Flag

Flag hand-baskets are also useful in gardens, both to use occasionally in gathering particular sorts of vegetable productions, and hardier sorts of fruits, and for sending or carrying small portions of different sorts, to any moderate distance, as may be required. And these kind of baskets are also useful in gathering some sorts of hardy fruit by hand, on high standard trees, such as apples, pears, &c. and green walnuts for pickling, and other sorts occasionally.

Baskets are also useful, in which to place, for conveyance, some particular sorts of curious or tender plants in pots, when intended to send or carry them in a growing state to any great distance, and for which the baskets are made of a width and depth, proportioned to the size of the plants, either for one large, or two or three or more smaller; and, if with largish heads, the top edge of the basket is set round with long osier or willow rods or wands; and the plants, when placed in the basket, having the head carefully tied close together, below and above, then the rods being gathered together at top, and thus fastened in a proper manner, will have a pyramidal form, so as to surround and defend the plants from external injury; and to effect this still more securely, a large garden mat may be fastened closely round the whole; which, if cold weather, and the plants of a tender nature, should not be omitted.

And sometimes in the work of removing for transplantation, some curious sorts of largish ever-greens, &c. in the full ground, with balls of earth about their roots, to be sent to some distance with said balls as entire as possible, that the plants may scarcely feel any check from transplanting, large, strong, coarse willow baskets, not very closely worked, are occasionally used, in which to place the plants, one only in each basket, with its said ball entire; and when arrived to the destined place, are either taken out of the baskets, or these cut away, to preserve the ball of earth compact; or if it should appear that this cannot be conveniently effected if the basket is removed, they may be planted basket and all, into the ground; cutting the sides a little open in different parts, the roots will make their way through, and the basket will rot and give full room for their growth.

In extensive pleasure grounds, sometimes large wide baskets, two or three feet deep, are used for carrying off the mowings of short grass in summer from lawns, &c. and fallen leaves in autumn; being either placed upon an open wheel-barrow, or having two opposite side handles at top, in which to place a long

pole, to be carried between two men; as these baskets contain considerably more than the body of a common wheel-barrow, and thereby the work may be done more expeditiously, with less wheeling to deface the lawns and walks; though in some places they have large, light, deep-sided wheel-barrow, for this purpose.

Baskets for the market-gardeners are of several sorts and sizes peculiar to themselves, for gathering and carrying their ware to market, and for which they have different terms, which about London are called maunds, junks, sieves, boat-baskets, bushel-baskets, and a larger deep oblong sort called barge-baskets, to hold two or three or more smaller occasionally, in which are contained particular sorts of early or prime goods, and frequently some principal kinds of fruit; they have also several other sorts of smaller and middling shallow baskets for their various occasions.

The different sorts of baskets for the several garden occasions may be procured at most of the basket-makers, or have them made to order, for the several purposes required.

But as many places are remote from cities and towns, inconvenient to procure ready-made baskets, in that case the gardeners often, at leisure times in winter, make their own baskets proper for their several occasions; and the proper materials for that purpose are the best sorts of pliant osier willow rods, or wands and twigs, of larger and smaller sizes; and for that occasion, where circumstanced as above, it would be proper to have some little plantation of the best osiers in any moist or watery situation, or along the side of a watery ditch, or brook, river, or pond, &c. and some kept down to low stocks, to afford an annual cutting of rods of proper growth for the above use. See OSIER and SALIX.

For the principal materials for making Baskets, see SALIX.

BASONS, or Reservoirs of Water, for use and ornament in gardens.

For useful purposes, Basons of water in gardens are essentially necessary for watering plants in summer, particularly such as are obliged to be planted out in time of drought; also for watering beds of young seedlings of any sort in dry hot weather, plants in hot-beds under glasses, and all sorts of plants in pots; and that water exposed to the sun and air in Basons, &c. is considerably more salutary for the growth of all vegetables, than raw sharp water, drawn immediately out of wells; but sometimes there are natural ponds, reservoirs, or other waters, in the neighbourhood of gardens, so conveniently situated for watering, as to render the expense of making

a Bason merely for that purpose, unnecessary.

For ornament, however, Basons or some similar compartments of water, of smaller or larger dimensions, in pleasure-grounds, are very desirable, and exceedingly proper to be introduced in some conspicuous district, especially in some lower part, or such situation where a proper supply of water can be the most readily obtained, either naturally, in or near the place intended, or conducted from a distance sufficient to continue the Bason, &c. always full to the requisite extent; and generally, in regard to situation, should be at some little distance within conspicuous view of the main habitation, and of the principal lawns and walks extending contiguous to the said mansion, and with intervening views from other parts of the pleasure-ground; especially where the surface of water is of some considerable expansion; but in small Basons this would not be material, as they could not make any conspicuous appearance at a distance.

With regard to figure or form and dimensions, &c. if a regular Bason is intended, it may either be circular or oval, small, moderate, or of extensive width, as may be convenient or thought expedient; or proportioned in some degree consistent with the eligibility of the situation, or that of such part of the pleasure-ground, &c. in which it may be intended, and according to the supply of water that can be commodiously obtained, as before observed; or, when it may be desired to have a Bason, or any compartment of water formed in some imitation of a natural order, the figure may be varied by gentle bends, swells and curves of different dimensions; or in some situations, it may be formed to imitate a lake or river, &c. in easy windings, less or more; and sometimes the extreme parts turned in a bold sweep between projecting side plantations, so as the termination may in a manner disappear, and seem in some points of view to extend in another direction, in continuation.

One great article in making Basons, or any pieces of water, is to consider whether a proper supply of water is to be obtained at all times of the year.

Another thing is the means of making them hold water completely at all seasons.

This is done the most effectually by laying the bottom and sides of the cavity thereof with strong clay, twelve, fifteen, or eighteen inches thick, according to the quality of the natural soil; for the more the bottom soil inclines to light, loose texture, gravelly or sandy, the greater thickness of clay must be allowed; but where the soil below is naturally of a strong loamy

or clayey kind, there will be little difficulty in making it hold water with a moderate thickness of additional clay.

In default of clay for the above purpose, chalk is sometimes used in countries where it abounds, first forming it into a powder, then working this into a sort of mortar, with which the bottom and side walls are formed, beating and ramming it hard, observing the thickness as above.

Some also, instead of clay, work the bottom and sides a foot thick with masonry of brick or small stones laid in terrass, and plaster it over with two or three inches thickness of cement, which is two thirds of powdered tile to one of lime, beating it well with as little water as possible, into a strong mortar, and after this is laid on, rub it over with oil or bullock's blood, and it hardens under water like stone.

The depth of Basons, or any ornamental piece of water, need not be more than three feet, though some are considerably deeper; but four feet at most is depth enough, even when intended to have a boat thereon, or to keep fish in for breeding. The sides of the cavity of the Bason should be formed with a gradual slope, from the top of the circumference to the intended depth, and the whole laid with clay, to render it water-tight, as before observed, and a few inches of gravel over that, to preserve it, and render the water clear; and the surrounding surface of ground should be laid with grass from the edge of the water to some considerable distance each way, though in the old designs, perpendicular walls of masonry, laid in terrass, were often formed round the sides of the cavity, with a stone coping at top, corresponding with the general surface.

No high banks or stiff slopes should be raised as boundaries to a Bason, or any piece of water intended for ornament, to obstruct the distant prospect thereof; and if so that the water will unavoidably lie low, it is proper to slope off the ground gradually from some distance on every side to the intended surface of water, so as the superficies of the circumference may more apparently correspond with the general surface of the surrounding ground; for the slope to the water, if necessary to have any, should be easy and natural, that the whole surface of water may appear as conspicuous as possible at some distance, and the whole so contrived, that the water may always appear nearly as high as the superficies of the margin of the Bason.

The situation for ornamental Basons, &c. should be in some conspicuous part, as far as may be consistent with the means of having

it properly supplied with water at all seasons, especially in summer, when it is the most desirable both for use and ornament; and where a large work is intended, we should also contrive it in the most eligible part, where as little digging as possible is necessary to form the cavity.

As to the dimensions or size, if designed merely for the use of watering plants, from ten to fifteen or twenty feet diameter may be sufficient; but when required for ornament, it may be any size or form, in proportion to the extent and form of the garden, or according to the supply of water that can be easily obtained, or the nature of the soil for holding the water; for where water is scarce, or that the soil is loose and sandy, nothing very extensive should be attempted, as the bringing clay from a distance to lay a large Bason fifteen or eighteen inches thick, as must be the case in light sandy ground, would be attended with a considerable expense; and if, after all, water was not to be had in sufficient quantity to keep the Bason always full, how great would be the disappointment! But where water is copious in the neighbourhood, either in an adjacent river, brook, or running spring, so situated that a sufficiency can be readily conveyed at moderate expense to the part of the ground required, a Bason of more capacious dimensions may be undertaken; and if, with the above circumstance of plenty of water, there is a natural loamy or clayey soil below, of proper depth, they are particular advantages; in which cases, Basons of considerable extent are sometimes easily formed with very little artificial claying, and some without any, where there is a good natural depth of clay at bottom and sides, and a large supply of water: however, in loose, hollow, sandy, or any light ground, a good coat of clay must be allowed all over the bottom and sides.

In setting out the dimensions of the Bason, observe, that where a full coat of clay is necessary, it must be staked out three feet six inches, at least, wider than its intended width to allow a twelve or fifteen inch stratum of clay on each side, and five or six inches of gravel over the clay; it should also be eighteen inches or two feet deeper than you design the depth of water, because the bottom ought to be clayed twelve to fifteen or eighteen inches thick, and five or six of gravel.

Particular care should be observed to stake the superficies of the circumference perfectly level, that the water may appear regular every way at the margin.

In digging out the cavity of the Bason, begin towards the middle, and excavate the earth

the intended depth, as above; then work off the sides regularly with a moderate slope from the edge of the circumference to the bottom of the Bason.

When the cavity of the Bason is formed, let it be well rammed and smoothed: then the clay is to be brought in, which should have been previously well wrought over and trod; and begin laying the bottom in the middle, being careful that no stones, sticks, or such materials, be mixed therewith, to occasion fissures to let off the water; spread it regularly, a little at a time, and tread it with men's naked feet, casting water thereon frequently, ramming it also from time to time with wooden rammers, observing, that if the bottom soil is of a light, or loose nature, should lay the clay fifteen or eighteen inches thick, and see that every part be well kneaded, that there be not the least vacancy; for the water will escape at the smallest cranny, and occasion great trouble hereafter. During the work, if the weather is dry, cover the clay, as you lay it, with mats or moist litter, or with the intended necessary stratum of gravel, laid the thickness mentioned below, to prevent the clay from cracking, continuing the claying regularly each way from the bottom to the top of the circumference of the Bason; and as soon as the whole is clayed, cover it immediately with a stratum of coarse gravel four, five, or six inches thick, which secures the clay, and renders the water always clear; and when thus far finished, let the water in as soon as possible. Then proceed to finish the superficies of the circumference, and lay it all round with turf from the water-edge to some considerable distance every way, as the situation shall admit, observing to lay it as far down on every side as the water will apparently stand, but not so as to form any slope, distinct from that of the immediate surrounding superficies; for if any at all is necessary, it should be contrived in one regular slope, which is the more agreeable to character, as the surface of water will more apparently correspond with the circumjacent surface of the ground, and appear the more conspicuous at a distance; so that when a surface of the water lies unavoidably much lower than the general surface, the ground on every side should be sloped off gradually to some considerable distance, as before hinted, that the descent to the water may be easy and appear as natural as possible, so as to admit of walking with pleasure upon any part thereof.

BASS, among gardeners, is pieces of the threads or strings of garden bass mats, extremely useful as ligaments in the culture of numbers of plants, and the most cheap and ready bandage for the use of gardeners.

As

As for instance, it is the best bandage that can be used for binding grafts and buds; also the most ready material for the tying up the stalks or stems of most sorts of flowering plants, and which, if fresh, will endure a year, or at least one summer; likewise is very useful in the kitchen-garden for many purposes, such as tying up the leaves of early cabbages, lettuce, endive, &c. to whiten and promote their heading; also for bunching up various sorts of pot and medical herbs for winter service, and for many other uses.

The Bafs for all these purposes should be quite fresh, not taken from such old mats as have been occasionally used in the garden; and where there is much tying, it is eligible to allot a mat or two entirely for that purpose, keeping it in the dry, and not drawing the Bafs, as is often practised, from the mats that are designed for other uses, which soon spoils them.

When it is wanted for tying, it should be drawn out regularly, and cut into equal lengths; and to render it more pliable and tough, should be dipped in water; then the gardener should tuck it in his apron-string, where it will be ready for use.

BASTERIA, All-spice. See **CALYCAN-THUS**.

BAUHINIA, Mountain Ebony.

This genus comprehends seven or eight species of tender exotic shrubs and trees, producing pentapetalous flowers in spikes, having ten stamina, and a declinated style.

They are rare in England; the following are cultivated in some of our stoves.

1. **BAUHINIA aculeata**.

Prickly Bauhinia, or Indian Savin.] Bauhinia with a prickly stem, rising fifteen feet high, having irregular branches, roundish emarginate leaves, emitting a balsamic odour like the favin-tree, and spikes of yellow flowers.

2. **BAUHINIA tomentosa**.

Tomentose Bauhinia.] Bauhinia with a smooth stem and branches, growing fifteen or eighteen feet high, heart-shaped, tomentose leaves, having two semi-orbicular lobes, and long spikes of yellow flowers.

They are propagated by seeds from abroad, assisted by a hot-bed, or the bark-bed in the stove, where the plants must always remain.

BEDS are small compartments of ground, of three or four feet breadth, very necessary in the culture of many sorts of plants.

In kitchen-gardens, it is eligible to sow and prick out many sorts of small plants in Beds, having narrow alleys between, for the greater convenience of weeding, watering, gathering, &c. without trampling on the crops; as, for example, the ground intended for asparagus and strawberries should be divided into four

feet wide Beds, with eighteen inches, or two feet alleys between; onions are also cultivated to the best advantage in four feet wide Beds, having ten or twelve inch alleys; the different sorts of lettuce and endive should also be sown and transplanted into separate Beds occasionally; as also various sorts of small plants can be more conveniently cultivated in Beds, or in borders of similar width; likewise early radishes should generally be sown in Beds or similar compartments of borders, which will be more convenient for their culture, such as covering them occasionally in frosty weather, and for weeding, thinning, watering, and gathering them on different occasions.

All sorts of plants that are particularly intended for transplantation, should always be sown in beds or narrow borders, so as to admit of standing to weed, water, and draw the plants, without treading upon them; also, for the same reason, all plants necessary to be pricked out previous to their final transplanting, should also be pricked in Beds, such as celery, cabbage, cauliflower, broccoli, &c. aromatic and medical herbs of all sorts should also, for the general part, be disposed in Beds with twelve or fifteen inch alleys between, or at least in borders of similar width: particularly mint, thyme, savory, majoram, sage, hyssop, balm, penny-royal, tansey, tarragon, feverfew, rue, &c. which method of bedding all the sorts of small plants above hinted, is not only more commodious for doing the necessary work without prejudicing the plants, but also has an air of uniformity, which is ever to be observed in a kitchen-garden.

The proper dimensions of Beds in this district is four feet, or four and a half in width, the length at pleasure, with intervening shallow alleys, nine, twelve, or fifteen inches, to two feet width, in the different sorts of plants, so that a person in the alleys may easily reach half across the Bed, to do the necessary work to the plants, &c. without trampling them, or treading the ground hard.

In flower-gardens, when designed separately from the general pleasure-ground, the ground should be divided into regular parallel Beds, of three or four feet width, with eighteen inch, or two feet alleys, especially when intended chiefly for the curious sorts of bulbous-rooted flowers, such as tulips, hyacinths, &c. also for ranunculuses, anemones, and other choice sorts, that, by being deposited together in Beds, having intervening alleys, admits of passing between them to perform the necessary works of culture, as well as to view the plants when in flower, which in many sorts appear to greater advantage when in Beds together.— These beds, in flower-gardens, should be neatly

ly edged with box or thrift. See *Buxus* and *EDGINGS*.

A flower seminary, or nursery for raising all sorts of flowers from seeds, slips, cuttings, parting-roots, &c. should also be divided into three or four feet wide Beds.

In nurseries for trees, the ground intended for the reception of seeds and cuttings of most sorts of hardy trees and shrubs, should also generally be divided into three or four feet Beds, with twelve or fifteen inch alleys between, for the reasons above mentioned.

Beds should not in general be raised but very little higher than the alleys, unless in cases of too copious moisture; but otherwise, the surface of Beds should not be more than three or four inches, at most, higher than the level of the alley; for, when raised considerably, the alleys assume the appearance of trenches, and have a disagreeable look.

BEGONIA (*Begonia*), an exotic shrub, rising three or four feet high, ornamented with angulate-heart-shaped leaves, and tetrapetalous flowers.

Class and order, *Monœcia Polyandria*.

Characters.] *CALYX*, none. *COROLLA*, tetrapetalous and cordate. *STAMINA*, numerous filaments, topped with roundish antheræ. *PISTILLUM*, an erect germen, with three membranaceous angles supporting three bifid styles, and globular stigmas. *PERICARPIUM*, a triangular three-celled capsule, containing many small seeds.

The species is,

BEGONIA nitida.

Shining-leaved Begonia.] *Begonia*, with a shrubby erect stem, branching three or four feet high, smooth, unequal, heart-shaped leaves, and bright purple flowers.

Varieties.] *Begonia*, with a rose-coloured flower—*Begonia*, with white flowers.

These shrubs flower in the stove in summer; and are propagated by seeds, layers, or cuttings: sow the seeds in pots, and plunge them in a hot-bed: layers may be done in spring, and in autumn may be taken off and transplanted: cuttings may be planted in pots in the spring, and put in a hot-bed; and in three months they will be rooted, fit to plant in single pots, and replunged in the stove.

BELLIS, that beautiful little perennial, the Daisy.

The garden Daisies, in all their different forms and colours, are varieties only of one species, the common white field Daisy, that adorns the meadows and pasture grounds in most parts of Europe, is supposed to be the parent of them all.

Class and order, *Syngenesia Polygamia Superflua*.

Characters.] Compound radiated flower. *CALYX*, a double series of small equal leaves. *COROLLA*, a numerous small, tubular, hermaphrodite florets compose the disc, and flat female florets the radius, and a single naked seed under each floret. See *COMPOSITUS Flos*.

But in the full double flowers, the radius or female florets, are increased to the very centre, and form the doubleness. See *PLENUS Flos*.

The species is,

BELLIS perennis hortensis.

Perennial Garden Daisy.] *Bellis* with a fibrous, perennial root, crowned by numerous small, oval, evergreen leaves, in a large tuft close to the ground; and amongst them rise many naked flower-stalks, four or five inches high, each supporting one radiated flower.

Varieties of this are,] Common garden Daisy with double white flowers—with double red flowers—with double white and red striped flowers—with variegated flowers—double scarlet flowers—double pied flowers—double quilled or fistular flowers—double white cock's-comb-shaped flowers—double red cock's-comb-shaped flowers—double speckled flowers—Proliferous, or Hen and Chickens Daisy, the most singularly curious of all, it being a large double flower, sending out many small ones immediately from its sides all around, each supported on a short foot-stalk, the whole regularly surrounding their common parent, appearing very ornamental.

All these varieties flower abundantly in April, May, and June, and have an exceeding pretty effect, when properly disposed in the fronts of borders in assemblage with other low-growing perennial flowers, and occasionally planted in edgings.

They are extremely hardy, and prosper in almost any situation and soil.

With regard to their disposition, some plant them to form edgings; but these soon become irregular; in which order of arrangement, however, the flowers are the most conspicuous, though, for the sake of diversity, I should also advise disposing many of them in different parts of the borders, towards the front, to form round patches or tufts a yard or two distance, planting the different varieties alternately, to effect the greater variegation.

When designed to plant any for edgings, they may either be planted by dibber two or three inches asunder in the row, or form a small trench, as in planting box, and placed therein, close together, as at once to form a compact edging; though this may be performed also by the dibber; and observing, that, as in edgings they

they are apt to spread irregularly out of bounds, in which case, they should be cut in on both sides; and where any die off in gaps, make good the deficiencies with proper rooted slips or plants; or old irregular edgings should be taken up, slipped and replanted, as above, once in two or three years, at the proper seasons.

The propagation of all the varieties is by dividing or slipping the plants in autumn or spring, and the smallest slip having a root fibre, will readily grow, and in one season increase to a large tuft; if, however, they are intended to make as great a show of bloom as possible, they should not be divided too small, and the slips may be planted at once where they are to remain; or where a large increase is wanted, may plant a quantity of small slips together in beds or borders, six or eight inches asunder.

As these plants increase considerably into bunches, they should be transplanted and slipped every year, or at least every second autumn.

This is also necessary to preserve the double state of the flowers. as, if permitted to remain long unremoved and slipped, they become small, and degenerate much to a single state, and bad colours.

The gardeners about London, who raise vast quantities to supply the markets in spring, always slip their store plants annually in autumn, in September or October, and plant them together in beds or borders, in rows six inches distance, planting some also in warm sunny borders, to facilitate an early bloom; for they always carry the plants to market when in flower, and the sooner this is effected in spring, the greater price they fetch.

At each time of slipping, always increase from the largest and fullest doubles; and those that discover any signs of degeneracy to singles, cast entirely out of the garden.

BELLONIA, an exotic shrub for the stove.

Class and order, *Pentandria Monogynia*.

Characters.] CALYX of one leaf, cut into five spear-shaped segments. COROLLA, monopetalous, and wheel-shaped, with a very short tube. STAMINA, five awl-shaped filaments, topped with erect connivent antheræ. PISTILLUM, a germen, with an awl-shaped style, crowned by an acute stigma. PERICARPIMUM, an oval top-shaped capsule, ending in a point, and containing many roundish seeds.

We know but of one species, viz.

BELLONIA *aspera*.

Rough balm-leaved Bellonia.] Rises with a woody stem ten or twelve feet high, sending out many side branches, which are garnished with ovate sawed leaves, rough underneath, and placed opposite the flowers, come out in

a corymbus from the wings of the leaves on very short petioles, and succeeded by oval capsules, filled with seeds. This plant being of the tender kind, must be constantly kept in the bark-bed in the stove.

Its propagation is by seeds sown in pots in the spring, and plunged in the hot-bed; and when the plants are come up should be planted singly in pots, and replunged, giving proper air, and shade in hot weather; they may also be raised by cuttings in the summer months, and managed as the seedlings.

BERBERIS, the Berbery-shrub, or Piperidge-bush.

This genus comprehends hardy deciduous shrubs, having simple oval leaves, and small hexapetalous flowers, mostly in small bunches.

Class and order, *Hexandria Monogynia*.

Characters.] CALYX, six concave coloured leaves, alternately smaller and larger. COROLLA, six small, oval, concave petals, and two coloured nectariums attached to the base of each petal. STAMINA, six erect, compressed, blunt filaments, and two antheræ attached to their apex. PISTILLUM, a long cylindric germen, no style, but a broad, orbicular, bordered stigma. PERICARPIMUM, a cylindric, blunt, umbilicated berry, of one cell, containing two seeds.

The species are,

1. BERBERIS *vulgaris*.

Common Berbery.] Berbery with shrubby woody stems and branches, growing eight or ten feet high, armed with thorns by threes; small, oval, slightly-ferrated leaves, placed alternate; and yellow flowers, in numerous small long clusters from the sides of the branches, succeeded by clusters of small, bright, red berries, in autumn.

Varieties of this are.] Common Berbery with red fruit, having stony seeds—with red stoneless fruit—with white fruit—with black sweetish fruit.

The root of all the varieties is yellow; also the inner bark of the stem and branches.

2. BERBERIS *cretica*.

Cretan Box-leaved Berbery.] Berberis with many shrubby stalks three or four feet high, armed with thorns at every joint, small oval leaves, and slender foot-stalks, each having one flower, but no fruit in England.

The first species, *Berberis vulgaris*, is the most commonly cultivated in the English gardens, and the red fruited varieties most of all; it grows wild in many of our woods and hedges, but has been long admitted an inhabitant of gardens, both as an ornamental shrub, and for the sake of its red fruit for domestic uses, which, growing in numerous

little

little clusters; have a very ornamental appearance in autumn, and when fully ripe, are a curious and very wholesome pickle; for which use, the stoneless red sort is in most esteem; the bunches of red fruit are also in much request for garnish to dishes; and where numbers of the shrubs are cultivated, the fruit affords a good repast for birds.

They flower in May, and the red sorts ripen fruit abundantly in September.

They are excellent furniture for wilderness or wood-works, or any of the large shrubbery clumps, in assemblage with common deciduous shrubs; and all the culture they require is, to reduce with a knife any rambling shoots. See SHRUBBERY.

But to have fruit as large and fine as possible, some plants may be disposed singly, trained with a single stem four feet high, then permitted to branch out to form a head, and take its natural growth, only cutting out luxuriant shoots and ramblers.

The common Berbery is also sometimes planted for hedges, both as a fence, as it grows thick and branchy quite from the bottom, and furnished with armature of small thorns, and occasionally to afford shelter to particular compartments, and by way of ornament.

Their propagation may be effected by suckers arising annually from the root.

Likewise abundantly by layers in the common way, any time from October till March, which will be rooted and fit to transplant the following autumn; cuttings of the young shoots, planted in autumn or spring, will also many of them strike, emit roots below, and shoots above, and form proper plants by the following autumn.

They may likewise be raised plentifully from seed, in a bed of common earth, in autumn, though the plants will probably not appear until the second spring; and when of one or two years' growth, transplant them in nursery rows.

BETA, the Beet.

This genus furnishes several varieties of useful culinary herbs, and esculent roots, of the kitchen-garden, all hardy biennial plants.

Class and order, *Pentandria Digynia*.

Characters.] CALYX, a five-leaved permanent cup. COROLLA, none; five stamina; a germen under the receptacle, and two styles, succeeded by an unilocular capsule, having one seed surrounded by the calyx.

There are two or three species, one of which grows wild on the sea-shores, and is seldom admitted in gardens.

The garden kinds are,

1. BETA *Cicla*.

The Common Culinary Beet.] Beta with a small, oblong, white root, producing from its crown many large, oblong, succulent leaves, on broad foot-stalks; and erect branching seed-stems two or three feet high, garnished with close-sitting leaves, and long spikes of greenish flowers, succeeded by plenty of ripe seed in autumn.

Varieties of this are,] Common green-leaved Beet—white-leaved Beet—large White Beet—Chard, or great Swiss Beet, having very broad leaves, with thick foot-stalks and ribs.

These varieties often vary from one to the other, the seed of one frequently producing some of each sort, though, by care in saving the seed, the difference may be continued.

2. BETA (*CICLA*) *major*.

Greatest German Beet, commonly called Mangel Wurzel; supposed a variety of the BETA CICLA.] Beta, with an exceeding large, long, reddish, or sometimes whitish-red root; and very large, oblong, thick succulent leaves.

Varieties.] With dark-green leaves—light-green leaves—red-veined leaves.

This is a lately introduced variety of Beet, has been much recommended for its vast growth, and great utility both in its root and leaves: the former, however, we have experienced, has but little claim to esteem for domestic economical purposes in this country, it being of an insipid taste and unpalatable; but the leaves being extremely large and succulent, are excellently good to use occasionally as the Common Beet; and particularly to boil like spinach.

3. BETA *rubra*.

The Red Beet.] Beta with a large, red, eatable root, crowned by many large, oblong, reddish-dark-purple leaves; and when it shoots, sends up erect stalks and branches, terminated by long spikes of flowers and seed.

Varieties of this are.] Common red Beet with a large, longish, dark-red root—turnep-rooted red Beet with a short, large, dark-red root—with a red root and green leaves—with a yellow root.

The first of these four varieties is generally preferred for general culture; though the second is equally good, but the root not so lightly shaped as that of the former; the other two are not eligible to cultivate for a crop.

Culture of the Common Sort and Varieties.

The first sort, Common Beet, and varieties, are choice culinary herbs, whose property resides in their large succulent leaves, which are excellent for soups, &c. also to boil and eat like spinach; and the large white and great Chard Beet are in much esteem also, for the stalks and ribs of the large leaves,

which being divested of the leafy part and peeled, are great improvers of soup, also for stewing, and to be dressed and eaten like asparagus, and the leaves themselves are fine pot-herbs, as above; for all of which uses the several varieties of this species may be obtained almost the year round; for as often as the large full leaves are gathered, the root continues sending up a fresh supply from the centre, not only in summer, but also in autumn, winter, and spring, in open weather.

All the varieties of this sort are propagated by seed sown annually in the spring, February, March, or April, in the places where the plants are to remain, which will attain proper growth for use in summer and autumn, and continue till next spring, then will shoot for seed; or if omitted sowing in the spring, may sow some occasionally in summer, any time till the beginning of August in a moist situation; but the spring sowing is the most eligible for a good crop.

They succeed in any common soil of the kitchen-garden, allowing each sort a separate plat or bed. Let the ground be dug one spade deep in the usual way; the seed may then either be sown broad-cast on the surface, and raked in; or, as it is a large seed, shallow drills may be drawn six inches distance for the common green and white varieties, but almost double that for the large White, and Chard Beet, sowing the seeds therein thinly, and rake the earth over them about an inch deep, and trim the surface smooth.

The plants will come up in about a month; when these have leaves an inch or two broad, they should be hoed, to thin them and destroy weeds, cutting out the common green and white sorts to about six inches distance; but the Chard Beet should be allowed ten or twelve inches room every way, that their large succulent leaves may have full scope to spread.

They will be in perfection for use in June and July, and continue till next spring, observing, when you gather them, always to take the large outward leaves; the others will come in for use in their turn, and an abundant successive supply will rise duly in the centre from the root.

Observe, a succession crop must be raised every year from seed in the spring, &c. agreeable to the foregoing intimations; for although the same crop might be occasionally continued two years, by cutting down the seed-stems of the year-old plants according as they advance in spring and summer, whereby the roots would abide and produce a supply of leaves; but which would be much inferior in sub-

stance to those of the annually-raised seedling plants; therefore should generally sow every year to have a good production.

Culture of the Mangel Wurzel Beet.

• The Mangel Wurzel Beet, supposed a variety either of the *Beta Cicla*, or *rubra*, having been much recommended in its first introduction into this country a few years ago, for its large root for economical uses in a family, but not acquiring much estimation for that purpose, is valued more generally for its leaves, and for which it principally merits culture in our gardens; as we cannot much recommend the root, which, although it grows very large, sometimes of several pounds weight; is greatly inferior in use, both to the Red Beet, and that of most others of our esculent roots for any domestic occasions; is sometimes dressed in the manner of carrots and parsneps, &c. sliced and served up with butter, but is generally of a mawkish unpalatable relish.

The leaves, however, which, if the plants have large scope of room, grow twelve or fifteen inches broad or more, and of proportionable length, are exceedingly good, when young, to use as the common white and green Beet; and the young, thick, fleshy stalks thereof, divested of the leafy part, peeled or scraped, then boiled and served up with butter, are tender and agreeably tasted; also the leaves to boil occasionally, as spinach and other small greens; and of which the root is remarkably productive in quick growth, to afford frequent successive gatherings all summer and autumn, &c. either cutting them off close, or gathering only the larger outward leaves, and in either method they soon shoot up again in a plentiful successive supply.

It is raised from seed sown annually in the spring, the same as the other sorts, in any open situation, but should generally be sown thinner, either in drills one or two feet asunder, or broad-cast on the general surface and raked in; and when the plants are come up, of one, two, or three inches in growth, they should be thinned to a proportionable distance to give room for the full expansion of their large leaves.

But in the culture of this sort, some advise transplanting, when the young plants are of two or three inches growth, setting them in rows one or two feet asunder, though we think this is unnecessary; especially, as they have long downright tap roots, which generally are the most successful when they remain where sown; however, the method may also be practised occasionally by way of experiment.

The plants generally continue a production of

of leaves great part of the year, and the roots attain perfection for use in autumn and winter till spring; but when required to have a principal crop of full-sized roots, some should be allotted for that purpose without cutting or gathering the leaves.

Culture of the Red Sort.

The second sort, *Beta rubra*, is highly valued for its large red root, which in the common variety often grows twelve or fifteen inches long, and three or four inches thick, or more, upward; but that of the turnep-rooted sort is much shorter and generally thicker, and of equal quality in goodness in every respect for use; and, in both of which, those that are of the largest growth, and darkest red colour, are the most valuable: these roots being tender, sweet, and palatable, are boiled, sliced, and eaten cold, &c. are also sliced and scraped in fallads, both as an eatable ingredient, and by way of garnish; slices of the root are also in request as garnish to dishes, and they are also used as a pickle:—the other varieties are never cultivated for any principal crop.

These roots are in perfection from the end of August until March or April, when they will shoot and become sticky.

This sort is raised from seed sown annually in March or April, in the place where the plants are to remain, being careful to procure that of the best dark-red sort.

It should be allowed a light, rich, deep soil, in an open exposure.

The market-gardeners often sow this sort thinly among their crops of onions, carrots, &c. that are to be drawn off while young; so that when these are gone, the Beets commence a full crop.

I should however advise to sow the principal crop separate, which, in the end, will be found to be the best culture. Let the ground be dug one good spade deep at least, and well broken, and sow the seed directly, which may either be sown broad-cast on the surface, and rake it well into the ground; or, as observed of the first sort, as the seed being large, that in order to bury it more regularly it may be sown in drills drawn an inch deep, and ten or twelve distance; or you may dot or prick it in, as often practised, with a blunt dibber, in lines the above distance, making the holes an inch deep, and eight or ten asunder in the rows, dropping two or three seeds in each hole, though only one good plant must be left in each place. In May or June, when the plants of either method of sowing have leaves an inch or two broad, they will require thinning and cleaning from weeds, which

may be performed either by hand-weeding or small-hoeing; the latter is the most expeditious for large crops, as well as loosens the surface of the earth, to the greater advantage of the young plants; however, in either method proceed in the work in proper time as above, and carefully eradicate all weeds, and thin the plants regularly ten or twelve inches distance, leaving no where two or more together, repeating the work, occasionally, to kill weeds, till the plants cover the ground.

Some of the roots will be fit to take up for use about the end of August, though they will not attain full perfection until October.

In November a quantity of the roots should be taken up, their tops trimmed off not too close, and then laid in sand or dry earth under shelter, to be ready for winter service.

Of saving Seed from both Species.

To save seed of all the varieties, either mark some of the best plants in spring to be left to run up, or they may be transplanted in February or March into a convenient place, to have shelter from winds; they will shoot up stalks in May; in June support them with stakes, and the seed will ripen in September.

BETONICA, Betony.

The plants are herbaceous fibrous-rooted perennials, having simple leaves, and annual stalks from one to two feet high, terminated by spikes of small ringent flowers; esteemed, some as medical plants, and some for variety in gardens.

Class and order, *Didynamia Gymnospermia*.

Characters.] CALYX is monophyllous, tubular, five-parted, and permanent. COROLLA is ringent, with a cylindric incurved tube, the upper-lip roundish and entire, the lower one three-parted, the middle part broad and emarginated. STAMINA, two long and two short filaments, and roundish antheræ. PISTILLUM, a four-parted germen, awl-shaped style, and bifid stigma. PERICARPIUM, none; four naked seeds lodged in the calyx.

The species are,

1. **BETONICA officinalis**.

Common Officinal Wood Betony.] Betonica with many oblong, indented leaves on long foot-stalks from the root, and square stalks a foot and half high, terminated by interrupted spikes of flowers.

Varieties.] Common Betony with purple flowers—with red flowers—with white flowers.

This species and varieties are wild plants of our woods, much valued for their medical properties.

2. **BETONICA orientalis**.

Oriental Betony.] Betonica with long nar-

row, hairy, indented leaves, on long foot-stalks from the root, and square, leafy stalks a foot and half high, terminated by a large entire spike of purple flowers.

3. *BETONICA danica stricta*.

Large Danish Betony.] *Betonica* with broad, heart-shaped, radical leaves; large upright stalks, ornamented with spear-shaped obtuse leaves, and terminated by oblong thick spikes of purple or white flowers.

All these are hardy plants, and will thrive in any situation.

They are propagated by seed and by parting the roots. Sow the seed in the spring, and the roots may be parted or transplanted either in the spring or autumn.

BETULA, the Birch-tree, comprehending also the *Alnus*, or Alder-tree.

This genus comprehends several species of hardy deciduous forest-trees, useful for purposes in gardening, and as underwood and timber-trees for many economical uses.

Class and order, *Monæcia Tetrandria*.

The flowers are produced in a cylindrical amentum or catkin, with male and female flowers on separate catkins, at a distance on the same tree: the male florets have four stamina, and the females two styles, succeeded by single seeds lodged in the scales of the amentum.

The species of most note are,

1. **BETULA alba**.

White, or Common European Birch.] *Betula* with an erect trunk covered with a white bark, rising twenty or thirty feet high, dividing into many moderate branches, adorned with small, oval, serrated leaves, ending in points.

Variety.] *Pendulous, or Weeping Birch.*

2. **BETULA nigra**.

Black Virginia Birch.] *Betula* with a large upright trunk, and spreading spotted branches, growing fifty or sixty feet high, garnished with larger, rhomboid-oval, doubly-serrated, pointed leaves, on long foot-stalks.

Varieties.] *Broad-leaved Virginia Birch*—*Poplar-leaved Virginia Birch*—*Paper Birch*.

3. **BETULA lenta**.

Canada Birch.] *Betula* with an upright trunk and spreading branches, growing sixty feet high; large, heart-shaped-oblong, pointed, serrated leaves.

Varieties.] *Dusky Canada Birch*—*White paper Canada Birch*—*Poplar-leaved Canada Birch*.

4. **BETULA nana**.

Dwarf Alpine Birch.] *Betula* with a shrubby branching stem two or three feet high, garnished with round crenated-edged leaves.

5. **BETULA Alnus**.

(Alnus).—The Alder-tree.] *Betula* with an upright stem, having purplish bark, rising thirty or forty feet in height, dividing into many purplish erect-growing branches, adorned with large, round, glutinous leaves, of a deep-green colour.

Varieties.] *Common round-leaved English Alder* as above—*Long-leaved American Alder*—*White Alder*—*Hoary-leaved Alder*—*Dwarf Alder*—*Cut-leaved Alder*.

All these species of *Betula* are extremely hardy, and will prosper upon almost any soil and exposure, either in large pleasure-grounds, parks, fields, &c.

For purposes in gardening, they, having straight smooth stems, may be introduced for ornament and variety in extensive grounds; their foliage will form an agreeable diversity in assemblage with other deciduous trees; but their flowers possess little beauty; they have a good effect in large wilderness and wood-works, and in ornamental plantations on the boundaries of parks and considerable lawns; also in internal clumps in parks, and some planted singly as standards in large opens.

The *Betula Alba*, or Common Birch, grows naturally in great plenty in many parts of Britain, prospers in any soil, wet or dry, boggy, stony, or sandy barren land, often sowing itself, and comes up abundantly in such places where hardly any other tree will grow; and in such ground it may be cultivated to advantage, both as a forest-tree for its timber, and as coppice or underwood, to fell every seven or eight years for poles, &c.

The timber of this tree, when old, is esteemed by the wheel-wrights, and turners value it for many purposes; its lopping is excellent fuel, and the brush-wood makes the best of brooms. See **BROOMS**.

The bark of these trees is of such durable nature, that the Swedes cover their houses with it in the manner of tiles.

Before the invention of writing-paper, the inner bark of this tree was sometimes prepared and used for that purpose; hence some sorts are called *Paper-Birch*.

A wholesome wine is made of the juice or sap of this tree, procured in March while the sap is in motion, by boring holes in the body of large trees, and putting in faucets or taps of small elder-pipes, to conduct the liquor into bottles, so that from a good many trees several gallons may be daily collected, without injuring the trees in their growth.

Coppices are formed of these trees in waste barren land, to cut as underwood every six, eight, or ten years, for poles, for hoops, and many uses in husbandry; also for the brush-wood

wood for birch-brooms, for which there is a constant demand. When such coppices are intended, they should be formed of young plants, previously raised in the nursery (see their *Propagation*); from thence planted out at five or six feet distance, which in seven or eight years will be ready to cut as underwood, and will support a cutting every sixth year for the broom-men, and every eighth, tenth, or twelfth year, for poles for the hoop-benders, and other uses, and for husbandry implements.

The two species of American Birch, and varieties, being equally hardy as the common sort, but more swift in growth, and obtain a large stature, may also be introduced in woods and other plantations among forest-trees.

The *Betula Alnus*, or Alder-tree, grows rapidly in marshy or watery places, or meadows contiguous to rivers, brooks, and other waters, in most parts of Britain, and is a useful tree both in its growing state, and its wood as timber, and for poles for various uses, which growing freely in any moist or boggy soil, it may be cultivated to good account in any waste, marshy, or swampy grounds.

In its growing state it is most useful to secure the banks of rivers, by planting truncheons pretty close, which will grow and send up numerous suckers quite from the lower roots; which effectually prevents the banks from being undermined by the current.

These trees are also useful to form hedges, to fence and divide boggy or swampy ground.

The wood of this tree is particularly valuable for works intended to be constantly under water, such as water-pipes, sluices, pumps, troughs, piles, &c. and the turners apply it to various uses.

Coppices of the Birch and Alder in boggy ground, to be cut as underwood every eight or ten years for poles or brooms, pay very well; and which plantation may either be formed by planting seedling-raised young trees from a nursery, of three or four to five or six feet growth; or the Alder also by strong cuttings of the young branches or shoots; and likewise by planting large truncheons or poles, cut three or four feet long from growing trees; sharpening one end, then making holes with an iron crow, &c. half a yard or two feet, and one or two yards asunder, plant the truncheons two feet in the ground; they will readily grow and send up several stems, which in seven years will be large enough to fell for poles, at which time clear away entirely every other stool, so that the remainder stand five or six feet asunder, and they will afford you a fall of good poles every eighth or tenth year.

But when intended to have these or any of

the Birches stand for timber, they must be left fifteen feet asunder.

The Propagation of all the Species.

The Birch-trees are propagated either by seeds or layers; the common sort afford us plenty of seed in autumn, but that of the foreign sorts is imported by the seedsmen from America. Sow all the sorts in beds of light earth in autumn or spring, covering the seed about half an inch deep, and the plants will come up in April or May; keeping them clean from weeds all summer; the spring following plant them out in nursery-rows two feet and half asunder, to remain till they are three, four, or five feet high, then transplant them where they are to remain.

By layers they may be raised plentifully from a few proper stools, having been previously headed down to the ground to produce lower branches, which, when two years old, will be well furnished with many side-shoots, and should then be plashed and layed together with all their young twigs, every one of which will grow, and be fit to be planted out in the nursery the following autumn, and the stools continue to furnish a fresh supply of layers annually.

By this method of laying, all the varieties of the foreign and other species are continued; for they vary from seed.

The Alder-tree is also propagated plentifully by seed and layers as above; also cuttings of any size, planted in any moist or marshy place, will put out roots freely, and in two or three years will become large plants of three, four, or five feet stature, when they may be planted out for good.

Large cuttings or truncheons of two or three feet long may be planted at once by the sides of rivers, brooks, &c. putting them two parts of three in the ground, they will grow, and afford a cutting for poles every seven or eight years.

BIENNIAL PLANTS. Plants, as the title *Biennial* imports, that are only of two years' duration.

Numerous plants are of this tribe, which being raised one year from seed, generally attain perfection either the same, or in about the period of a twelvemonth, or a little less or more, and the following spring or summer shoot up stalks, flower, and perfect seeds, soon after which most sorts either commonly perish, or if any particular sort survive another year, they assume a dwindling and straggling growth, and gradually die off; so that Biennials are always in their prime the first or second summer, and therefore in the general part must be raised every year from seed for successional

successional supplies, both of esculent kinds and flowers.

Biennials consist both of esculents and flower-plants.

Of the esculent kinds, the cabbage, favoy, carrot, parsnep, beet, onion, leek, &c. are Biennials. See KITCHEN-GARDEN PLANTS.

Of the flowery tribe, the Canterbury-bell, French honeysuckle, wall-flower, stock-July-flower, sweet william, China-pink, matted pink, carnation, scabious, tree-mallow, vervain-mallow, tree-primrose, honesty or moonwort, &c. are all of the Biennial tribe; all of which being sown in March, April, or May, rise the same year, and in spring following shoot up into stalks, flower and perfect seeds in autumn, after which most of them dwindle; though the wall-flowers, stocks, sweet-williams, and carnations, will survive and flower the following year; but the plants become straggling, the flowers small and badly coloured; it is therefore eligible to raise a supply annually from seed, of all the sorts; although wall-flowers, carnations, and pinks, may be continued by slips and layers, in the utmost perfection, in a perennial state, by raising some every summer by these methods of propagation. See each sort under its proper genus.

BIGNONIA, Trumpet-flower, or Scarlet Jasmine.

The *Bignonias* are of the shrub and tree kind, comprehend many species, three or four of which are cultivated in our shrubberies, and consist of climbing shrubs and an upright tree, garnished, some with winged, others with simple leaves, and campanulate trumpet-shaped flowers.

Class and order, *Didynamia Angiospermia*.

Characters.] **CALYX** is monophyllous, cup-shaped, and quinquefid. **COROLLA** is one bell-shaped petal, having a long tube, swelling and five-parted at top, the two upper parts reflexed, the under ones spread open. **STAMINA**, two short and two long filaments, and oblong reflexed antheræ. **PISTILLUM**, an oblong germen, slender style, and headed stigma. **PERICARPIUM**, a bivalvate pod of two cells, containing numerous winged seeds placed imbricatum.

The plants are mostly of American growth; those cultivated in our gardens are,

1. **BIGNONIA radicans**.

Radicant Climbing Ash-leaved Scarlet Bignonia] Bignonia with climbing shrubby stalks, radicant or rooting at the points, mounting upon support, thirty or forty feet high, ornamented with pinnated opposite leaves of four pair of small sawed lobes and an odd one, and all the shoots and branches terminated by

beautiful clusters of large trumpet-shaped scarlet flowers.

Variety.] Radicant leafy Ash-leaved Bignonia with small flowers.

2. **BIGNONIA unguis cati**.

Cat-claw Bignonia.] Bignonia with trailing stalks, requiring a wall for support, and rooting at their joints, ornamented with oblong evergreen leaves, growing in pairs, and short crooked tendrils divided in three parts; the flowers are yellow and produced from the wings of the leaves.

3. **BIGNONIA sempervirens**.

Evergreen Climbing Virginia Bignonia.] Bignonia with climbing slender stalks, twining upon support twenty or thirty feet high; simple lanceolate leaves placed opposite, and trumpet-shaped, erect, yellow flowers, from the sides and ends of the stalks and branches.

Variety.] Evergreen climbing four-leaved Virginia Bignonia.

4. **BIGNONIA Catalpa**.

Catalpa, or Tree Bignonia.] Bignonia with an upright, strong, woody stem and branches, rising twenty feet high, ornamented with large heart-shaped leaves five or six inches long, almost as broad, placed by threes, and whitish-yellow-striped flowers in panicles towards the ends of the branches.

The flowers of all the species are monopetalous, tubular, long, and somewhat trumpet-shaped (see the *Characters*), appearing mostly in August, but rarely produce seed-pods in England.

As to their use in gardens, they are all employed as plants of ornament.

The first and second sort, if planted against high walls, will soon cover them, they emitting roots at all the joints of the stalks, which strike into the joints of buildings, and mount to their tops if ever so high, where they will endure many years, and flower annually.

The third sort and variety being somewhat tender, must be planted against a warm wall, and sheltered from frost with mats while young.

The *Catalpa* is a very ornamental, hardy, deciduous shrub, or rather tree, worthy of a place in all curious shrubberies, as during the summer season, when clothed with its luxuriant beautiful foliage, no tree makes a more noble appearance, which, on account of its singular beauty, should be placed conspicuously, and some should be disposed singly upon spacious lawns, or other large opens of grass-ground, and permitted to take their natural growth.

Propagation of all the Species.

The three first species and varieties may be propagated

propagated by layers; every shoot laid will readily grow, and will flower in two or three years.

Cuttings of the strong shoots will also put out roots freely.

They may also be raised from seeds procured from America, sowing them in pots in spring, and place them in a moderate hot-bed, from which the plants must be inured to the full air in summer, sheltered in winter from frost, and in spring plant them out in the full ground; but plants thus raised rarely flower in less than six or seven years.

The *Catalpa* may be propagated by cuttings of its young shoots, aided by artificial heat, planting them in pots in spring, which plunge either in a common dung hot-bed, or in a bark-bed; they will strike in a month or six weeks, when they must be hardened to the open air, in which let them stand till October, then moved to a place of occasional shelter from frost, and in spring following plant them out in the nursery.

This plant is also raised from seed, either in a warm border, or in pots, and plunged in a moderate hot-bed, which will facilitate the germination of the seed, which is sometimes apt to remain a year before it begins to grow.

BIVALVE, an appellation given to such pods or capsules as consist of two valves inclosing the seeds.

BIXA, Dying *Mitella*, Spanish *Anotta*, or French *Roucou*.

There is but one species, an evergreen shrub of the hot-house.

Class and order, *Polyandria Monogynia*.

Characters.] **CALYX**, a plane, obtuse, permanent cup. **COROLLA**, ten large oblong petals in a double series. **STAMINA**, numerous bristly filaments. **PISTILLUM**, an oval germen, slender style, and parallelly-bifid, compressed stigma. **PERICARPIUM**, an oval, heart-formed, hairy capsule of two valves and one cell.

The species is,

BIXA Orallana.

American Bixa.] **Bixa** with an upright stem ten feet high, branching out into a regular head, garnished with heart-shaped, pointed leaves, placed alternate, and reddish flowers in panicles from the ends of the branches, succeeded by large, pulpy, red fruit; in great request among dyers and painters.

This tender American shrub is retained here in stoves for variety.

It is propagated by seeds from America, sown in pots in spring, and plunged in a bark-bed, and the plants are to be transplanted into separate pots, and always retained in the stove.

BLIGHTS. These are infectious distempers, which often attack our fruit-trees in spring and summer, frequently destroying the leaves, blossoms, and fruit, and sometimes prove destructive to the trees themselves.

Many have attempted to account for the causes of Blights. Some suppose they proceed from some particular defect in the soil; others attribute the whole to the air, whilst others are of opinion that it proceeds from the particular state of the trees themselves, especially when they assume a weakly habit; some again ascribe the distemper to easterly winds, bringing vast quantities of insect eggs from a distance, or that long dry easterly winds, unaccompanied by rain or night-dews, stop the perspiration in tender blossoms, and occasion them soon to wither and decay; and by long continuance of the same weather, the leaves and tender shoots are also affected in like manner, and the perspiring matter thickens to a glutinous consistence, adhering to the surface, becomes nutriment to those small animalcula which we often find so numerous on the leaves and young shoots of fruit-trees, discoverable by the shrivelling or curling of the leaves, and which, though not generally supposed to be the first cause of the distemper, yet they spread the mischief considerably, as often, from a few twigs, they will over-run a whole tree, and spread themselves to others on every side, to the destruction often of a whole wall of trees.

Against this annoyance to our fruit-trees there is no guard, nor any certain general method of cure after the trees are once considerably attacked.

Various methods however are practised to save wall and espalier-trees when the infection appears, such as, when the distemper is slight, to pinch off all the worst leaves, to prevent its spreading; also to cut off part, or even whole shoots, when most of the leaves on them, or the shoots themselves, are infected, cutting them off below the distempered parts, and they will probably shoot out again the same or next year. After these operations frequently dash the trees with water in a morning or evening, either out of a common watering-pot, or a garden watering-engine, the latter of which is the most effectual, which by a daily repetition for a week, will have a great effect in preventing the disaster from spreading, if not totally eradicate it, when not very formidable.

Or may also occasionally strew tobacco-dust over the trees, or sprinkle them with water in which tobacco-stalks have been infused.

There is a species of Blight called a fire-blast, the most certain and sudden destruction

to,

to fruit-trees of any, as in a few hours it not only destroys the leaves and fruit, but frequently the branches, and sometimes whole trees, and for which there is not the least remedy.

A sort of pestilence sometimes attacks wall-fruit trees, which causes the leaves and shoots to become black and clammy, often terminating in their destruction, and will run through the whole walling, if not stopped by removing the disordered parts, and sometimes the whole tree; and washing that part of the wall with lime or strong brine.

BLITUM. Blite, or Strawberry-spinach.

The plants are herbaceous annuals of the ornamental kind, rising with stems two or three feet high, garnished with spinach-shaped leaves, and clusters of strawberry-like fruit; hence the name Strawberry-spinach.

Class and order, *Monandria Digynia*.

Characters.] **CALYX**, is tripartite, spreading, and permanent. **COROLLA**, none. **STAMINA**, one small bristly filament, and double antheræ. **PISTILLUM**, an oval-pointed germen, two styles, and simple stigmas. **PERICARPIUM**, a small, oval, compressed capsule, having one globular compressed seed the size of the seed-vessel.

The species are,

1. **BLITUM capitatum.**

Capitated Strawberry-Spinach.] Blitum with upright herbaceous stalks, two feet and a half high, garnished with triangular spinach-shaped leaves, and flowers in clustered heads at the joints and crown of the stalks, succeeded by red strawberry-like fruit.

Variety.] Capitated White Strawberry-Spinach—Red-leaved Strawberry-Spinach.

2. **BLITUM tataricum.**

Tartarian Strawberry-Spinach.] Blitum with herbaceous stalks, rising a yard high; triangular, acutely-indented, spinach-shaped leaves; and single heads of flowers, growing only from the sides of the stalks, succeeded by small, red, strawberry-like fruit.

3. **BLITUM virgatum.**

Dwarf Virgate Strawberry-Spinach.] Blitum with a slender stalk about a foot high; triangular, spinach-shaped, indented leaves; and heads of flowers growing sparsely all along the sides of the stalk, succeeded by small, reddish, strawberry-like fruit.

Varieties.] Dwarf Striped-leaved Strawberry-Spinach—Dwarf White Strawberry-Spinach.

All these species and varieties are hardy annuals, and rise in spring first with a few leaves, shooting up stalks in May or June, flower and ripen fruit in July, August, and September, and soon after perish.

They merit culture as plants of ornament, for the singular variety of their fruit, being the size of common wood-strawberries, and numerous on the stalks, make a fine appearance in July and August, but are not eatable.

They succeed in the common borders; and some planted in pots to adorn court-yards, in assemblage with other potted plants, have a pretty effect.

Their propagation is by seed annually in March or April, sown either in patches in the borders where they are to remain, or together in a bed of common earth, to be afterwards transplanted into the places where they are to flower, covering the seed about half an inch deep, and the plants will appear in a month, observing, if they are sown in patches, to leave only three in a patch, at five or six inches distance, and if sown in a bed for transplanting, they must be planted out before they begin to shoot up their stems, disposing them as above in different parts of the borders; and if any are to be potted, plant one in each pot, giving the whole occasional waterings.

When their stems are advanced, support each with a stick, otherwise the weight of the berries will bear them down to the ground.

BOCCONIA, Greater Tree Celandine.

There is but one species, a shrubby West-India exotic of the stove, esteemed for the beauty of its large foliage.

Class and order, *Dodecandria Monogynia*.

Characters.] **CALYX**, two oval concave leaves. **COROLLA**, no petals. **STAMINA**, twelve short filaments, and long antheræ. **PISTILLUM**, a large, roundish, contracted germen, semi-bifid style, and single stigma. **PERICARPIUM**, an oval, compressed fruit of one cell, full of pulp, and one seed.

The species is,

Bocconia frutescens.

Shrubby Bocconia.] Bocconia with an upright, straight, robust, branching stem, growing ten or twelve feet high, covered with a white bark; large, oblong, deeply-sinuated, glaucous leaves, ten or twelve inches long, half as broad, placed alternate; and flowers in loose spikes from the ends of the branches.

The whole plant abounds with a yellow acrid juice.

This plant is propagated by seeds from the West-Indies, sowing them in spring in pots of light earth, and plunge them in a bark hot-bed; and when the plants come up, prick them into separate pots, which must always be kept in the stove.

BOMBAX, the Silk Cotton-tree; so called from the fine silky down contained in the seed vessel.

There

There are three species, trees of extraordinary magnitude and lofty stature, natives of America, Asia, and Africa, where, modern writers affirm, they are so large, that sixteen men cannot fathom them, and so tall, that an arrow cannot reach their top, with heads so widely diffused (says Bosman in his Description of Guinea) that 20,000 men closely armed, might easily stand under the branches.

They are retained in this country in hot-houses, as plants of singularity, and for the variety of their singular foliage; but there are little hopes of their ever flowering in England.

Class and order, *Monadelphia Polyandria*.

Characters.] CALYX is monophyllous, campanulate, quinquefid, and permanent. COROLLA is divided into five oval concave segments. STAMINA, many filaments united below, and incurved antheræ. PISTILLUM, a round germen, slender multiparted style, and round stigmas. PERICARPIUM, a large, oblong, turbinate, ligneous, quinquivalvular capsule of five cells, full of a cottony down, inclosing many round seeds.

The principal species are,

1. BOMBAX *Ceiba*.

Ceiba, or Thorny Bombax.] Bombax with an upright straight trunk, closely armed with short strong spines, branches coming out near the top, adorned with leaves composed of five long spear-shaped lobes, connected at their base, and polyandrous flowers at the ends of the branches, succeeded by oval fruit larger than a swan's egg, filled with seeds and cotton.

2. BOMBAX *pentandrum*.

Pentandrous Smooth Bombax.] Bombax with an upright, straight, unarmed trunk, branching at top, garnished with leaves composed of nine long spear-shaped lobes, united at their base, and pentandrous flowers from the end of the branches, succeeded by large oval fruit full of seeds and cotton.

3. BOMBAX *heptaphyllum*.

Heptaphyllous Smooth Bombax.] Bombax with an upright, straight, unarmed trunk, branching near the top; heptaphyllous, or seven-lobed leaves, united at the base; and polyandrous flowers, succeeded by large oval fruit, containing seeds and cotton.

These trees being natives of both Indies, and other warm parts of the world, in this country must always reside in a hot-house.

They are raised from seeds procured in the capsules from the West Indies. Sow the seeds in spring in pots of light earth, and plunge them in a substantial hot-bed of dung or tan, where the plants will appear in three or four weeks, which are to be pricked into separate

small pots, plunging them in the bark-bed, giving shade and water, and let them be constantly kept in the stove, shifting them occasionally into larger pots and fresh earth, watering them plentifully in summer, but moderately in winter.

BONTIA, Wild Olive of Barbadoes.

This genus comprises one woody pyramidal evergreen of the stove, of ornamental appearance.

Class and order, *Didynamia Angiospermia*.

Characters.] CALYX, a small quinquefid permanent cup. COROLLA, one ringent petal, with a long tube gaping above, the upper lip erect and emarginated, the under one trifid and revolute. STAMINA, four filaments, two longer than the others, and simple antheræ. PISTILLUM, an oval germen, simple style, and bifid stigma. PERICARPIUM, a large oval berry, including an oval nut.

The species is,

BONTIA *daphnoides*.

Daphne-like, Barbadoes Wild Olive.] Bontia with a woody stem and branches, rising ten feet high; oblong, narrow, smooth, thickish leaves, crenated at the edges; and flowers from the sides of the branches, succeeded by large oval fruit, that sometimes ripen in England.

This plant is propagated easily by seeds in a hot-bed; also by cuttings, with the same assistance, and the plants must always remain in pots, and reside in the hot-house.

BORAGO, Borage.

Of this genus are two hardy herbaceous plants, cultivated in our gardens, an annual and a perennial, rising with stalks two feet high, simple leaves, and monopetalous flowers.

Class and order, *Pentandria Monogynia*.

Characters.] CALYX is five-parted at top, and permanent. COROLLA, a single rotated petal, with a short tube, spreading and five-parted above. STAMINA, five connivent filaments, and oblong connivent antheræ. PISTILLUM, four germina, slender style, and single stigma. PERICARPIUM, none; the calyx becomes swollen, and contains four roundish seeds.

The species are,

1. BORAGO *officinalis*.

Common Annual Borage.] Borago with annual roots, large, oblong, rough leaves, spreading on the ground; rough, branching flower-stalks two feet high, garnished with leaves placed alternate, and many small flowers from the sides and top of the stalk and branches.

Varieties.] Common Borage with blue flowers—with red flowers—with white flowers—with variegated leaves.

2. BORAGO *orientalis*.

Oriental Perennial Borage.] Borage with fleshy, spreading, perennial roots, sending up large heart-shaped leaves, and stalks two feet high, dividing upward into foot-stalks, terminated by panicles of pale blue flowers.

The *Borago officinalis* is the Common Annual Borage, an excellent pot-herb; and the young leaves and flowers are by many esteemed to eat as a salad, and put in wine for cool tankards, and the flowers also for medicine.

The plants rise in spring, shoot up flower-stalks in May, June, and July, and continue flowering till autumn, when they perfect seeds, and then die.

They are propagated by seeds any time in spring, summer, or autumn, in any common soil, in the place where the plants are to remain, observing, when a constant succession of young, tender leaves are required, it is proper to make three different sowings from spring till autumn. Sow the seed broadcast, and rake it in; and when the plants have leaves an inch broad, clean and thin them by hoe to six or eight inches distance.

The spring and summer sowing come in for plentiful use, the same year, in summer and autumn, both of leaves and flowers; and the autumn sowings furnish supply in winter and next spring.

If this plant is permitted to stand to ripen and scatter its seeds, there will be a supply of plants at almost all seasons of the year, which will continue rising every time of stirring the ground.

But to have regular crops, should always make a principal sowing in spring, as above, or a smaller in summer, to continue a succession of young tender leaves, all that season and autumn: and to continue a supply in winter, sow a last crop early in August, which will furnish young leaves all winter and following spring, and in May will shoot up stalks for flowering.

The plants produce plenty of ripe seed in summer and autumn.

The Oriental Borage is a perennial, and chiefly esteemed as a flowering plant; it will prosper in any dry soil; and its propagation is either by seed, or dividing the roots in autumn.

BORBONIA, a genus of green-house exotic shrubs, with butterfly-shaped flowers.

Class and order, *Diadelphia Decandria*.

Characters.] **CALYX**, a monophyllous, turbinate cup, half cut into five lanceolate-pointed, spinous segments. **COROLLA**, five papilionaceous petals; the vexillum obtuse and reflexed; the wings shorter and semi-cordate; and the carina dipetalous, moon-

shaped, and blunt. **STAMINA**, ten filaments, nine of them united, and small antheræ. **PISTILLUM**, an awl-shaped germen, very short style, and obtuse, emarginated stigma. **PERICARPIMUM**, a roundish mucronated pod, having kidney-shaped seeds.

This genus furnishes several species: the principal are,

1. *BORBONIA lanceolata*.

Spear-leaved Borbonia.] Borbonia, with spear-shaped, many-nerved, entire leaves, and yellow flowers at the ends of the branches.

2. *BORBONIA crenata*.

Crenated heart-leaved Borbonia.] Borbonia, with heart-shaped, many-nerved, crenated leaves and yellow flowers, in clustered spikes at the ends of the branches.

This last species is a small shrub, rising between two and three feet high; they both flower in July and August, and are propagated by sowing the seeds in the spring, and managed as others of the like nature, or by laying down the young shoots.

BORDERS. In gardening, Borders are useful narrow compartments of ground, which divide and encompass the different principal divisions of a garden, and bound the walks.

Borders may be considered of two kinds, the useful and ornamental.

For useful purposes, one sort are those which are carried round the walls of a kitchen-garden, &c. and are most useful, whereon to plant various sorts of fruit-trees, such as peaches, nectarines, apricots, &c. to be trained to the wall to form wall-trees; and such of those borders as are of a south aspect, are likewise extremely useful, whereon to raise various early esculent herbs, roots and legumes; and those of the other aspects are proper for the raising and pricking out many sorts of plants in summer, that require some degree of shade at particular periods of growth.

These borders should be a yard at least wide, but if six or eight feet, the greater advantage it will be to the trees, &c. as well as for raising various under-crops in greater perfection.

Another sort of useful Borders are those which divide and surround the principal division of the kitchen-garden, and immediately verge the main walks, which are useful, whereon to plant ranges of dwarf apple, pear, plum, medlar, and cherry-trees, &c. to form an espalier (see *ESPAIER*); as well as for the culture of many herbaceous esculents; and should generally be from four to five or six feet wide; the line of espalier trees planted at least three or four feet from the outer edge

edge thereof; so that here will be a three or four feet border outward next the walks, and a smaller one within the espalier; the broader outward border serving for the culture of many low-growing esculent plants occasionally; and sometimes, when the kitchen and flower-garden is all in one, may serve as a flower Border; and the smaller inward Border will be useful in raising many sorts of small plants and herbs.

Borders in pleasure-grounds are to be considered as of the ornamental kind.

In this district formerly Borders were very predominant; almost every walk was bounded on each side by a Border, embellished with various ornamental plants: this taste however is now almost supplanted; but a grand walk, ornamented on each side with a spacious border full of curious flowering plants, makes a noble appearance.

Likewise Borders for flowers, carried along the boundary of grass lawns contiguous to the main habitation, &c. either straight or serpentine, have also an agreeable effect.

Borders for particular curious flowers, such as the curious sorts of hyacinths, tulips, ranunculuses, anemones, carnations, &c. may be made either along the sides of walks, or detached.

The proper breadth of Flower-borders is, that, if intended chiefly for small plants, or for the different sorts of bulbous-rooted flowers, they should be four feet wide; but if designed for all sorts promiscuously, they ought to be six or eight feet in breadth.

Borders that immediately verge gravel or sand-walks, should be planted with edgings of dwarf evergreen plants; several sorts are used, such as box, thrift, daisies, pinks, &c. but the former is the neatest and most durable edging yet known. See *Buxus*.

The Borders should always be raised two or three inches above the common level, and those that are detached should generally be finished off with a gentle swell or rounding.

BOSEA, *Yerva Mora*, or Shrubby Golden-rod.

This genus furnishes but one species, an exotic shrub of the green-house.

Class and order, *Pentandria Digynia*.

Characters.] **CALYX**, five roundish concave leaves. **COROLLA**, no petals. **STAMINA**, five filaments and simple antheræ. **PISTILLUM**, an oval-oblong germen, no style, but two stigmas. **PERICARPUM**, a globular berry, having one seed.

The species is,

BOSEA *Yerva-Mora*.

Yerva-Mora, or *Golden-rod-tree*.] **Bosea** with a strong woody stem, dividing irregularly into branches, grows eight or ten feet high, garnished with long leaves, whitish underneath, with purple veins, and purple flowers in clusters from the ends of the branches.

It is an exotic from the Canary islands, and is retained here, to add to the collection of the green house.

Its propagation is by cuttings planted in pots in spring under glasses; or plunged in a hot-bed, in which they will more quickly emit roots, though they often effect it without that aid.

BOSQUETS are clumps, or detached compartments of ornamental trees, shrubs, and plants, disposed either in a regular or irregular form, to embellish gardens, parks, &c.

These compartments have a very ornamental effect in gardens, and are composed of a great variety of deciduous and evergreen trees, and herbaceous perennial flowers of tall growth.

In dimensions they should be proportioned to the extent of the ground, even from ten to an hundred feet or more in width; though the size and form should be varied in the different situations and exposures, to effect the greater diversity, some roundish, oblong, curved; others, bending in swells and sweeps outward and inward, larger and smaller; disposed some towards the boundaries of spacious lawns, and other grand open spaces of grass ground, in forming shrubby clumps; and some of larger dimensions distributed in parks, paddocks, &c. and on the boundaries of spacious rural avenues, and that of a principal carriage-way leading from the road entrance through part of a park or grand lawn to the mansion, in all of which forms and directions, they should generally be stationed in some varied order; some more or less forward, others more inwardly in a similar manner; all at proper distances to admit of capacious intervening opens between.

In planting and embellishing these compartments, great variety of shrubs and trees should be employed, both evergreen and deciduous, of different magnitudes, shades, and times of flowering; and particular care is necessary to dispose the trees and shrubs according to their several growths and statures, so as they rise gradually one above another from the sides to the middle, and at such proportionable distances, that there may be full scope for the rural diffusion of branches, so as each

fort may display its spreading head according to its natural growth.

It is most advisable to plant the deciduous trees and shrubs, and the evergreen kinds, principally in separate clumps; though a few dwarf evergreens may be distributed in the fronts of the deciduous compartments; and in the clumps of both sorts may be planted also, towards the sides, various kinds of tall perennials, and near the edges low plants of primroses, polyanthus, violets, daffodils, &c.

These compartments in pleasure-grounds should all remain open, not inclosed with any sort of hedge, as was generally practised in the ancient designs of gardening, but so as the different sorts of trees, shrubs, and plants, may appear fully to view from the lowest in front, to the tallest in the middle or back-part.—But in parks and other similar extensive grounds, these compartments should generally be formed principally with the larger hardy tree kinds, and larger sorts of hardy shrubs; and defended from cattle with open hurdles till of some considerable growth.

All the culture necessary to the various plants in these compartments, is to cut out any dead wood, and retrench or shorten very irregular branches, just to preserve them within some moderate regularity, and each sort distinct; and the ground between the plants to be annually dug, especially in small Bosquets, and hoed two or three times in summer to destroy weeds.

BOWLING-GREEN, a spacious level grass-plot in pleasure-grounds, designed both for ornament, and the recreation of bowling in summer.

This compartment is generally planned near the habitation, contiguous to the back or side-fronts, sometimes serving also by way of a lawn to that part; or it may be stationed at the termination of a grand walk or avenue of moderate extent, for it should not be far from the house; or it might be contrived amidst any contiguous detached plantation, or wilderness-work, serving also by way of a grand opening to such places, and should at any rate have the advantage of the shade of tall trees, so stationed on the boundary as to afford shade, which, at least, should be pretty considerable in an afternoon, that being the time of day company usually walk out to take the diversion of bowling.

As to the dimensions, where there is scope of ground, it should not be less than an acre; and as to figure, the most common is that of an exact square; but some are also

oblong, others are circular; though to suit the general plan or figure of the ground, it may be contrived either of a regular form, or any well-calculated rural design, when consistent with the other works of the garden; and its boundaries may be a spacious border, either straight or serpentine, embellished with the choicest shrubs and flowers.

The plane or surface of the Green should generally be of a horizontal level, or nearly so, according to the situation, and as high at least as the general level of the adjoining ground, so as to preserve it always free from standing water.

It should be levelled in an exact manner, and laid with the finest grass-turf that can be procured from a close-pastured common or downs. See **TURF**.

The dimensions and proper level of the Green should be set out with stakes, placed round the extremity or allotted boundary, fifteen or twenty feet asunder, and on these to mark the determined level of the ground; and from which, on the opposite sides, level in others cross-ways at the same distance; and then, according to the aforesaid determined level marked on the stakes, proceed by line and spade to form the ground to a proper surface, by making it up firmly in lines from stake to stake; and according to which, make up the pannels or spaces between equally firm and regular, not to sink in hollows hereafter; so rake the whole level, and finish it off evenly and smooth; and if, at last, two or three inches depth of light sandy soil, or any light dry poor earth is laid evenly over the general surface, all of one sort of equal quality, the grass will more effectually form regularly, an even fine sward.

The grass-work should most advisedly be effected by laying the surface with the turf, greatly superior to forming it by seed; and the turf for this purpose should be chosen of as a fine, a close smooth sward as possible from some downs or close-pastured common, as above intimated; and this should be cut in the usual way, each turf a foot wide, a yard long, and about an inch thick, and which should be laid with neat exactness, closely joining them edge to edge; and afterwards well beaten with large wooden beaters, and repeatedly rolled with a large heavy roller. See **GRASS** and **TURF**.

To keep the Bowling-Green in neat order, after being formed as above, it will require frequent mowing in summer; probably, once a week or oftener, to keep the grass very short, proper for bowling on; likewise will need occasional rolling to preserve the surface firm and

and even : also, when earthy worm-casts are thrown up considerably over the surface, it should be poled to break and scatter them about, and then rolled with a wooden roller, to which the scattered earthy particles will readily adhere, and the surface thereby will be rendered clean in the requisite orderly manner. See **POLING-GRASS**.

If any gross weeds appear in the Green, such as dandelion, &c. they should be eradicated clean to the bottom.

BRACTEA, a Floral Leaf, the botanic term for such leaves that are attendant on the flower, coming out with it on the same stalk, differing in size, shape, and colour, from the other leaves of the plant, and are often situated so near the flower as to be sometimes mistaken for the calyx.

BRACTEA is also one of the seven fulcra, or props of plants.

BRASSICA, the Cabbage, Cauliflower, Broccoli, &c.

This genus is very comprehensive in useful esculents of the kitchen-garden; it includes not only the numerous tribe of cabbages, favoys, borecole, and coleworts, but also the cauliflower, and all the varieties of broccoli, and, according to Linnæus, also the turnep; but to render every thing as intelligible as possible for practice in their cultivation, we shall treat of each article in a separate division, under the generic head *Brassica*.

Class and order, *Tetradynamia Siliquosa*.

Characters.] **CALYX**, four spear-shaped, concave, deciduous leaves. **COROLLA**, four oval plane petals placed cross-ways. **STAMINA**, four long, and two short filaments, and erect, pointed antheræ. **PISTILLUM**, a taper germen, short style, and headed stigma. **PERICARPIUM**, a long depressed pod of two cells, filled with round seeds.

Some botanists contend, that there is only one real species of cabbage, and that the original species is the wild perennial sea-cabbage, and the parent of all the different cultivated varieties of cabbage, favoys, borecole, coleworts, turnep-cabbage, cauliflower, and broccoli. Whatever the five former sorts may be, the cauliflower is apparently a distinct species of the same genus; and the broccoli is most probably a variety of the cauliflower.

But in the general botanic arrangements the *Brassica* comprehends fifteen or sixteen, or more different species, of which not more than three, considered as distinct species, and their respective varieties, are esteemable for economical culture either in gardens

or fields, and these are mostly, or the greater part, very valuable esculent plants, comprising in one species and varieties, all the heading cabbages, favoy cabbages, borecoles, common coleworts, turnep-cabbage, the cauliflower, and broccoli, and in the other two, the rape and turnep; the other species being but of little consideration either for use or ornament, or principally only for botanic observation, I shall therefore proceed only in the description and culture of the abovementioned useful species and their respective varieties; first, the said species and principal varieties in a continued arrangement; and afterwards, each sort, and its different varieties, together with their several methods of culture, will be fully described under separate heads, or distinct divisions.

The species and varieties for our purpose are,
I. *BRASSICA oleracea*.

Oleraceous, or Pot-herb Common Cabbage.] *Brassica*, or cabbage with a biennial root, upright, fleshy stalk, crowned with a large head of oblong-roundish leaves, in some varieties closely cabbaging in a large compact head, in others, spreading loose and open.

Varieties of this, according to the modern botanists, are,

BRASSICA oleracea capitata.

Heading Common Cabbage.] Producing a roundish and oblong closely-cabbaged head, of roundish and oblong plane, entire leaves,—comprising many valuable varieties. See *First Division*.

BRASSICA oleracea sabauda.

Savoy Cabbage, or SAVOY.] Producing a roundish and oblong closely-cabbaged head, of roundish, crumply-curled leaves,—Several varieties. See *Second Division*.

BRASSICA oleracea fimbriata.

Fimbriated open Cabbage, or BORECOLE.] Producing a tall stem, crowned by an open loose head, of oblong, cut, fimbriated-curled leaves, spreading open; never cabbaging.—Several varieties. See *Third Division*.

BRASSICA oleracea fabellica.

Siberian Borecole, Scotch Cole, or Kale.] Producing a strong stem, coronated by a large open head, of oblong, roundish, broad, thick, cut, curly leaves; not cabbaging; including some varieties. See *Third Division*.

BRASSICA oleracea viridis.

Green COMMON open COLEWORT.] Producing a short stem, crowned with an open head of oblongish plane leaves, not cabbaging. See *Third Division*.

BRASSICA oleracea Napobrassica.

Turnep-Cabbage.] The stalk and root swelling

ing turnep-shaped, crowned by a head of open oblongish leaves; never closing to cabbage. *See Fourth Division.*

BRASSICA oleracea cauliflora botrytis.

Clustered Brassica, or the CAULIFLOWER.] Producing an upright shortish stalk, crowned by an open head of oblong, narrow plane, entire leaves, not cabbaging; but having a large clustered flower-head in the centre. *See Fifth Division.*

BRASSICA oleracea Italica.

Italian Cabbage, called BROCCOLI.] Having, an erect, robust stalk, crowned by a large, open head of oblong, dark, and light-green plane leaves, not cabbaging, but having a clustered flower-head in the centre, in the manner of a cauliflower—Several varieties. *See Sixth Division.*

Thus far the systematic botanists suppose all the foregoing to be only accidental varieties of the *Brassica oleracea*, or common cabbage: there is, however, a very apparent, and seemingly permanent, difference in the general habit or manner of growth in several of the sorts; but conformably to the prevailing botanic system, I have ranged them accordingly under the aforesaid specific head *Brassica oleracea*; and shall describe each, and its respective varieties, under a distinct or separate division.—*See each in its place.*

But the following is considered as a distinct permanent species of the open cabbage tribe.

2. *BRASSICA Napus.*

Navew, Rape, or Cole Seed.] Brassica, with a spindle-shaped biennial root; and oblong, lyre-shaped, deeply-divided, sinuated smooth leaves, not cabbaging; the stem leaves oblong-cordate. *See Seventh Division.*

The next following is undoubtedly a distinct species, and, in its general habit, apparently a very different plant from the cabbage kind; but the systematic characters of its flowers being similar, the modern botanists range it as a species of Brassica.

3. *BRASSICA RAPA, (Rapa).*

The Turnep.] Produces a large, round, fleshy, annual root, crowned with oblong, cut-sinuated, rough leaves—many valuable varieties. *See Eighth Division.*

As the above articles are commonly considered as different plants among gardeners, and mostly requiring different culture, we shall treat of them, and their respective varieties, under separate heads, as before observed; and first of the Common Cabbage.

First Division.

1. *BRASSICA Capitata, Common Heading Cabbage, and varieties.*

The varieties of this sort are numerous, and are all denominated Cabbages; from the circumstance of their inner leaves turning in closely one over another, till by degrees they form a large, compact, globular, or oval head, some varieties of which obtain an enormous magnitude, and sometimes weigh fifty or sixty pounds.

As some varieties are in perfection in summer, others late in autumn, they are divided into different classes. viz. 1. Summer Cabbages, 2. Autumn Cabbages.

The Summer Cabbages are,

1. *Early Summer Cabbage.*

Varieties.] Small roundish early Cabbage—Larger oblong early Cabbage.—The first sort comes early in May, the second about the middle, or towards the latter end; both of which soon become very hard and crack; so there should not be any considerable quantity raised for private service.

2. *Sugar-loaf Cabbage.*

Varieties.] Early Dwarf Sugar-loaf Cabbage—Large Hollow Sugar-loaf Cabbage.—The first is a small, longish, pyramidal Cabbage, comes early in June, and is very sweet while young, but soon grows hard; the second is a fine, large, pyramidal, hollow Cabbage, comes the end of June, and is in fine perfection in July and August, seldom grows hard or cracks, and is a fine family or marketable Cabbage.

3. *Early Yorkshire Cabbage.]* A roundish-oblong heading Cabbage of a moderate size; close-growing, quick-hearting, cabbaging early in summer, May, June, or July, &c. and is an exceeding good, tender-boiling, sweet-eating Cabbage, proper to cultivate with the large sugar-loaf kind, &c. for a principal early, and general summer crop; and for autumn and winter, young, light Cabbages.

4. *Early Battersea Cabbage.]* A roundish-oval-heading, moderately-smallish Cabbage; heads quick, comes early; and is excellent for use while moderately young, or of middling light growth before it becomes very hard.

5. *Early Russia Cabbage.]* A small roundish Cabbage, comes in June and July, heads very fast, and soon grows hard; but if used while young and hollow, is very sweet and tender.

The following are autumn and winter Cabbages.

6. *Common Round White Cabbage.]* A larger middle-sized, roundish, very white Cabbage; is in perfection in August and September, gradually acquires a degree of hardness, and is hardy to endure the winter.

7. *Long-*

7. *Long-sided Cabbage.*] A large, oblong, somewhat hollow Cabbage, comes in for use in August or September, and continues excellent all October and November, and seldom grows very hard.

8. *Hollow Cabbage.*] A large oval and roundish hollow Cabbage, never grows hard, is exceeding sweet and tender eating, and is in high perfection in August, or September and October.

9. *Drum-head, or Great Flat topped Cabbage.*] A very large spreading Cabbage, generally cabbaging very broad, and flat at top, and pretty close and firm, is in perfection in September, and will continue till Christmas or after.

10. *Musk Cabbage.*] A middle-sized, roundish, hollow, very tender, crisp-eating Cabbage, of a musky scent; is in perfection from August or September till Christmas.

11. *Giant, or Great Scotch Cabbage.*] An admirable, large, roundish Cabbage, heading very close and hard, arrives to perfection in September and October, and will continue all winter; valued principally as a field Cabbage for feeding cattle; or eligible for family use occasionally.

12. *American Cabbage.*] A very large, roundish Cabbage; principally for field culture.

13. *Devonshire Cabbage.*] An exceeding large very good Cabbage, eligible both for the purposes of the two last sorts, and is a profitable domestic Cabbage, the end of autumn and in winter.

14. *Red Cabbage.*] A middle-sized, roundish, thick-leaved Cabbage, heading very hard, the whole as red as blood, and the darker the red, and the more thick and fleshy the leaves, without any white in the ribs and veins, the more valuable; is in perfection from autumn until the end of winter, and all the spring months till May; esteemed principally as a choice vegetable pickle: also to shred and eat raw as a salad, being seasoned with vinegar and oil, &c.

All these varieties of Cabbage are of the biennial tribe, being raised from seed, and attaining perfection one year, the next they shoot up into stalk for flower and seed, and soon after totally perish.

They are all raised from seed annually in beds of common earth, from which they must be transplanted; the time for sowing is autumn and spring; those raised in autumn arrive to perfection early the following summer and autumn, and the spring-raised plants cabbage the same year in summer and autumn;

and which in those denominated summer kinds will attain full perfection; but the larger autumn sorts sown in the spring will not generally cabbage so soon in autumn, equal in size, as the autumn-raised crop, planted out, some in the latter end of that season or beginning of winter, and the rest early in spring, and will be cabbaged in good perfection in August and September; however, it is always proper to sow some in both the above seasons, autumn and spring. See their CULTURE.

Culture of the Summer Kinds.

For the early and first general summer crops, the proper sorts to sow are the dwarf and other small earliest kinds in a smaller portion; a larger supply either of the Battersea, or principally the large Sugar-loaf and Yorkshire, or also some of the early Russia Cabbage; the smaller early kinds will come in soonest by some weeks, probably some in the latter end of April, or beginning or middle of May, &c. and will be succeeded by the others in June and July; and for which different crops should sow some both in the spring and autumn: the spring-sown plants come in for use the same year; but the autumn-raised plants, sown in August, are to stand the winter in young growth, to come in for the principal earliest and first general crops next summer; that is, being raised as above, some are planted out the same season in October or November, the others in the spring; the early kinds attain perfection in May; which will be succeeded by the Sugar-loaf, Yorkshire, and Russia Cabbage in June and July, furnishing a supply till autumn, when these will be succeeded by the spring-raised plants, either of the same, or large late sorts; but the large Sugar-loaf and Yorkshire Cabbage are what I should chuse to cultivate principally for the general summer crop, particularly for supply of a family, being the finest eating Cabbages, and continue the longest in perfection; for the small early kinds generally cabbage very fast, nearly together, or in quick succession, soon grow hard, and crack or split; and do not continue long in good condition.

So that, observing these two principal seasons of sowing these sorts,—autumn for the early and first main summer crops, and of which should generally sow some principal supply,—and the spring sowing for succession-crops, in which it is also essentially necessary to sow some tolerable supply in February, or March and April, of the best summer kinds, to come in for successional young summer and autumn Cabbages to succeed the earlier crops: and if omitted

omitted sowing in autumn for early Cabbage, should not fail to sow as early in the spring as the weather will permit, the beginning or any time in February, or early in March, in a warm situation.

Therefore, in order to raise an early and general summer crop of any, or all of these sorts, let some good fresh seed be procured for sowing the first or second week in August: mark the time; for if sown earlier, the plants are apt to fly up to seed in spring, and if sown much later, they will not acquire due strength before winter.

At that time prepare a spot of rich ground in an open exposure, digging it nearly one spade deep, and divide it into one or more four feet wide beds; directly sow the seed, each sort separate, and immediately rake it in evenly. If the season proves showery, the plants will rise in ten or twelve days; but if dry weather prevails, it is necessary to water the beds frequently, both before and after the plants appear, and keep them clean from weeds.

About the middle of September, or when the plants have leaves an inch or two broad, it is proper to prick out a quantity of the largest from the seed-bed into nursery-beds, to acquire due strength previous to their being planted out for good in October and spring. For this purpose of pricking out, dig an open spot of the best ground, divide it into four feet wide beds, and rake the surface smooth; here prick the plants in rows six inches distance, and three or four inches apart in the lines, giving directly a hearty watering, which, if dry weather succeed, should be repeated occasionally.

Here they are to remain, some till October or November, and the principal part till February or March, and April, at each of which times a quantity of the stoutest plants are to be transplanted for good into the places where they are finally to remain to cabbage; good ground in an open exposure must be allowed them; and if this is well dunged, it will be a particular advantage to the crop, digging in the dung one spade deep; then by line and dibble proceed to put in the plants in rows, the small early kinds two feet row from row, and about the same distance in the lines; but the large Sugar-loaf kinds, and Yorkshire Cabbage, should be set two feet and half distance every way; and a double quantity of these sorts should also be planted, if for the service of a family; for the small early kinds seldom continue long before they grow hard.

Or in planting these crops of early or summer Cabbages, either in autumn or spring,

some may occasionally be planted closer than the above-mentioned distances advised for the principal standing crops, in order to admit of thinning them for use, by degrees, in young, small cabbaged-hearts; and for which occasion, a portion may be planted in rows only eighteen inches asunder, by a foot in the rows; and so in the spring, or about April and May, when of some advanced growth, forming little closing-hearts, as above intimated, may begin cutting out some in a thinning order, as aforesaid, leaving a sufficiency at some regular distances to attain a larger growth, or some to form full-cabbaged heads, according to that of the respective varieties.

In the above crops, those of each sort that are planted in the autumn will generally come in for use the earliest: and the spring plantation will succeed them regularly; or, however, if omitted planting in autumn, about October, November, or December, should not omit planting in the spring, as soon as the weather is mild, and the plants in good condition.

Observe that, as the autumn plantation sometimes suffers by the severity of frost, or other causes, in winter, when this is the case, the deficiencies must be made good occasionally from those in the nursery-beds.

Those plants that have remained in the nursery-beds all winter, should be planted out finally in February, if settled, temperate, open weather; though, if they are much cut by the winter's frost, it is proper to let them remain until March or April to recover, planting them as above directed.

When the winter happens to prove so severe as to cut off most of the autumn-raised plants, recourse must be had to an early spring-sowing in February, or early in March; but the sooner the better.

But where a constant succession of perfectly young Cabbages are required to be continued through the summer and autumn seasons, it is eligible to perform a spring and summer sowing, to succeed those of the autumn-raising; therefore sow some of the large Sugar-loaf and Yorkshire Cabbage in February, March, or beginning of April, and a smaller portion in May, managing them as already directed; which will furnish a supply of young Cabbages in July, August and September, &c. or may also sow a small crop in June, or early in July, to plant for a succession of small young Cabbages, or good Cabbage Coleworts, in the latter end of autumn and early part of winter.

All the culture these crops require after being finally planted out, is to hoe the ground occasionally

occasionally between them in dry weather, to destroy weeds, and to loosen the surface of the earth to encourage the growth of the plants; and when they have advanced a little in growth, to draw some earth once or twice about the bottom of their stems, which will strengthen the plants, and forward them considerably, as probably, if a forward spring, the earliest sorts will make an effort for heading the latter end of April, or early in May, when if you are anxious to have them as forward as possible, some of the best may be assisted, by tying their leaves moderately close together with an osier-twig, or piece of bafs, which will forward their cabbaging, whiten them a little internally, make them more crisp and tender, and they will be ready for the table a week or ten days sooner.

In cutting the summer Cabbages for use, it would be proper to permit the stalks of some to remain to produce a crop of sprouts, which they will effect abundantly; and these may either be gathered while young and green, or some might stand to form little heads, either of which are in many families preferred to any other summer greens; for which purpose, therefore, of yielding sprouts, a quantity of the Sugar-loaf and Yorkshire Cabbage-stalks should be particularly left in summer and autumn.

Culture of the Autumn Kinds.

As already noticed, the autumn and winter Cabbages are, the Common Round White Cabbage—Long-sided Cabbage—Hollow Cabbage—Flat-topped Cabbage—Musk Cabbage—Giant or Scotch Cabbage, &c.—and the Red Cabbage.

Of these sorts shall first proceed in the culture of those commonly considered as white or green Cabbages, and then that of the red Cabbage separately.

These sorts are adapted principally for autumn and winter use, as they rarely attain tolerable perfection before August, and some of the larger kinds not till September and October, and continue in excellent condition till Christmas, or sometimes till the end of winter, some of which arrive at an enormous bulk, and if used while young, that is before they grow hard, are excellent eating.

The season for sowing all these late kinds is either in autumn or spring: but to have a large succession, it is proper to sow some at both seasons; those sown in autumn, i. e. the first week in August, arrive at perfection betimes the following autumn, that is, August and September; and the spring sowing come in about the beginning or middle of September, or towards Michaelmas, though they seldom

attain any tolerable perfection till the end of October, and are very fine in November and December, but rarely obtain so large a growth as the autumn-raised plants.

As before observed, the autumn sowing is to be performed in the beginning of August, and the spring sowing in March, or early in April.

The same method of sowing the seed, and pricking out the plants, is to be observed, as directed for the summer kinds; and the time for transplanting them finally is, for the autumn-raised plants, a few in October or November, but the principal part in February, or early in March, and the spring-raised plants will be ready to plant out in May or June; all of which must have an open exposure, well-dunged ground, and the plants set in rows two feet and half at least distance; but for the larger kinds, a yard distance each way should be allowed. All the culture they need is hoeing, to extirpate weeds, and drawing earth about their stems, which is an essential piece of culture to all the Cabbage kind.

The Red Cabbage, which is valued principally for pickling, and occasionally to shred small to eat by way of a salad, also sometimes for stewing in a particular manner, attains perfection in autumn and winter; and its culture is nearly the same as the former sorts; the seed may be sown in autumn and spring; but as being a late Cabbage, the spring-raised plants do not acquire the full size so soon in the proper season as those sown and raised in the preceding autumn; though it is generally proper to sow some in both these seasons, whereby to obtain a longer succession.

But it is most advisable to sow the main crop in autumn, i. e. beginning of August, and the young plants will be fit to prick out in September or October in nursery-beds, setting them four or five inches asunder, and watered, if dry weather; there to remain to acquire a proper growth for final transplanting, either some the same year, in November, or beginning of December, and the rest in the spring, or the whole or principal part remain till that season in February or March; observing, in either of these times of final planting, to allot them an open situation of good mellow ground, which, if manured with dung, will be of particular advantage: then drawing a quantity of the strongest plants from the nursery-beds, plant them in rows not less than two feet and a half, or more advisable a yard distance every way, if rich ground, that they may have proper scope for their large spreading growth in eligible strength to produce large, full-cabbaged heads by Michaelmas.

They being thus finally transplanted, give them the requisite culture in their advancing growth, in spring and beginning of summer, of occasional hoeing, both to destroy the rising weeds, and to loosen the surface of the ground, and, at the same time, to draw a little earth about the lower part of their stems: and they will thus advance in their usual growth, generally in a spreading open manner at first, then, towards autumn, gradually form closing hearts in the centre, and increase to large cabbaged heads in full perfection in September and October, &c. and continue five or six months or more, being very hardy to stand or resist severe frosts.

Next, with respect to a spring sowing before intimated, this is necessary both to have a succession to the autumn-sown main crop, ready, if wanted, in winter and following spring, and also to continue longer in the last-mentioned season before they shoot for seed; or, likewise, if omitted sowing a main crop in autumn, should not neglect sowing in proper time in spring; generally in February, or early in March, but not later than that month; and the young plants, in April or beginning of May, pricked out four inches asunder, and occasionally watered, and remaining thus a month or five weeks to obtain some tolerable strength, plant them out finally two feet and a half asunder, and watered; giving the necessary culture of hoeing as in the former-mentioned crops; they will cabbage in moderate heads, about September and October, and continue increasing in size in November and December, if open weather, proper for use in that season, and continue good late in the spring, till April and May.

Or to obtain a spring-sown crop as forward as possible for final transplanting, some may be sown in February in a moderate hot-bed; and the young plants pricked out in March or beginning of April in a warm situation, or in a frame, if an unkindly season, in order to have occasional protection with glasses, &c. in cold nights, and sharp cutting weather, to continue them forward in proper growth for planting out finally in April or beginning of May, and thereby cabbage sooner in greater perfection of size in autumn.

Cabbage Coleworts.

Cabbage Coleworts are now almost universally substituted in lieu of the common open green Colewort, which, though of estimation on account of its hardness, in being proof against frost, yet, as table-greens, is apt to boil tough and rank-tasted, and greatly inferior to the former. What was originally understood by Coleworts, are such Cabbage-greens

that never close or cabbage, but always remain quite open and green to the heart, so were formerly raised for autumn, winter, and spring, to use as open greens; and that by cultivating and raising cabbage plants as such, while they continue open and green, or just forming little central hearts, are commonly now denominated Coleworts, which are the most excellently sweet and tender greens that can be cultivated for autumn and winter eating, and continue exceeding fine all the spring, and supply the table till the arrival of summer Cabbages; so that for winter and spring supply a considerable quantity should always be raised every autumn, and occasionally in spring and summer, for summer and autumn Coleworts: which should generally be some of the early Cabbage kinds of the close-growing, quick-hearting sorts, as these, even in their young Colewort state, will generally have small closing hearts of the Cabbage nature; and what are not used in their young Colewort growth, being permitted to stand, will grow to proper full-headed Cabbages.

For this purpose of Cabbage Coleworts, any of the smaller or moderate-sized sorts of white or green, heading Cabbages may be cultivated: though it would be most advisable to adopt principally some of the early or summer Cabbage kinds, as being of a more close-hearting growth, more tender and sweeter than the larger kinds, to use as Coleworts; and of which early or summer kinds it would be most eligible to sow chiefly the larger sorts, such as the Sugar-loaf, Yorkshire, and Battersea Cabbages; though the Sugar-loaf kind generally surpasses all other sorts for delicacy of eating.

The proper time for sowing the seed of either kind, for the purpose of Coleworts, is any time in July, for the autumn and winter crop; but to have them continued, without running, for spring drawing, some seed should also be sown the beginning and middle of August, as observed of the Cabbages, and the plants will continue in a Colewort state all the spring months till May, when, such as remain, will advance in growth to heading Cabbages, either to cut young in small hearts, or some permitted to grow and form proper cabbaged heads, as may be required.

But where a succession of Coleworts are required in continuation, all summer and autumn, it is proper to sow some of the same sorts also in the spring, in February, March, or beginning of April, and in June and July, to plant out at different times; and they will thus furnish Coleworts and small-hearted young cabbages throughout the summer months.

As

As to the culture or order of raising these different crops of Coleworts, generally sow each crop in an open situation, sowing the seed moderately thick, and rake it in evenly: and when the plants have leaves two or three inches broad, transplant them where they are finally to stand, in rows a foot asunder, and half that distance in the rows; all the culture they require is to have the ground hoed, to kill weeds, and loosen it about the plants; and when their leaves are as large as a man's hand, or thereabout, they are of due size to begin to draw as Coleworts.

In drawing the Coleworts for use, especially the spring crop, where there is a large quantity, may draw every other row, permitting the intermediate ones to stand to cabbage, so cutting for use also every other one in the remaining rows, according as they form little hearts, leaving the others to cabbage more perfectly.

Saving Cabbage-Seed.

The common method to save Cabbage-seed is to plant some of the full-grown Cabbages in autumn or beginning of winter in a dry spot, trenching them in down to their heads at two feet distance each way; or otherwise, if deficient of full Cabbages for this occasion, may either permit a quantity of Cabbage-stalks of the respective sorts, from which the main heads have been cut for use, to remain, especially such as are well-furnished with strong sprouts, or transplant them, trenching them down to their tops in rows together, in some convenient compartment; and either of which permitted to remain for producing seed, which will answer nearly the same purpose as full Cabbages; but in this case observe, none of the large sprouts must be gathered from the said stalks; or may also occasionally for seed slip off a quantity of young sprouts from the stalks of early-gathered Cabbages in July, August, or beginning of September, in moist weather, and planted twelve or fifteen inches asunder, giving occasional waterings if dry weather; they will readily take root and grow; and in the spring will shoot up stalks for seed.

In the above business of planting Cabbages for seed, it is necessary here to remark, that in order to continue the respective varieties genuine, should generally select some of those for this purpose as are the most perfect in their kind; for without this precaution they will degenerate. Another thing of importance is, that if it is intended to save seed from more than one sort, the different varieties should be planted as far distant from one another as the extent of the garden will admit, to prevent as

much as possible the communication of the farina of the different sorts, which would fecundate each other, and the effect would be productive of a mongrel breed.

They will all shoot up in stalks the following spring, flower in June, and produce ripe seed abundantly, and in full perfection, towards the latter end of July, or early in August.

When the seed begins to ripen, watch the birds, which will attack it voraciously from every quarter.

As soon as it is fully ripe, which is very discoverable, cut the stalks off near the bottom, and after being exposed a few days in the sun to dry, let the seed be threshed out upon cloths, or a close, even floor, and spread it in a dry airy place a day or two to harden, then put it up in bags.

Second Division.

2. *BRASSICA Sabauda*, the Savoy-Cabbage, or Savoy.

The Savoy is a variety of the Cabbage, though with care it will always retain its difference from seed; it admits of some varieties, all of which have crumply-curled leaves, and they head or cabbage to a large size, which are fine eating from August till March.

The Varieties are,] Common Green Savoy—Large Green Dutch Savoy—Yellow Savoy—Round-headed Savoy—Oval-headed Savoy—Sugar-loaf Savoy.

These varieties are excellent for autumn and winter service; they cabbage to fine handsome heads, which never grow hard nor crack, greatly excelling any other sort of headed Cabbages for winter eating; and as they endure the frost better, they are most profitable both for family use, and the supply of markets during winter.

They are propagated by seeds sown at two or three different times; that is, if intended to have Savoys as early as possible, may perform a small first sowing in August, as directed for the common Cabbages, or as early in February as the weather permits, to come in for early heading the following autumn; and perform a larger sowing in March, and a principal sowing the beginning or middle of April, by which practice you will have a fine succession of large heads from about the middle of August to the end of winter; those of the autumn, or early spring-raised plants will be exceeding large, and in fine order for eating, part of August, all September and October, which will be succeeded by the others in September, October, and November, and which will continue through the winter, and part of the spring, till they run up for seed.

Each sowing should be in an open situation,

and raked in, and when the plants have leaves an inch or two broad, and that, if they stand thick in the seed bed, it is proper to prick out a quantity of them three or four inches distance, to acquire strength against the time for planting them out finally. Some of the autumn-raised plants may be planted out for good in October, November, or December, if open weather, or wholly in the beginning of spring; or any raised from an early spring sowing in February, &c. should be planted out finally as soon as the plants are of proper growth; and the general crops of the spring-raised plants of March and April are to be planted out occasionally as ground is cleared, any time in May, June, July, and August; those planted out early should be set two feet and half distance every way, and the next crop about two feet; but the latter plantations need not be planted more than a foot and half distance; all of which plantations should be in open exposures, the farther from trees, hedges, buildings, and the corners of gardens, the better, as the less liable they will be to the depredations of caterpillars, as is the case frequently with those in close situations.

It is customary to plant out the summer plantations of these plants between rows of forward beans, peas, kidney-beans, cauliflowers, early cabbage, and other crops that stand distant in rows, and are soon to come off the ground; by this practice some time is gained, though the plants are generally finest in the end, when they are planted in a clear spot of ground, previously dug for their reception.

In performing the summer plantations, it is of much advantage to chuse moist weather for that work, otherwise watering must be practised several times till the plants strike root.

All the culture they require, is to be hoed to kill weeds, and draw a little earth up to their stems.

To save Savoy-seed you may either plant down a quantity of the best sorts in winter, or beginning of spring, or permit the stalks to stand, or transplant them to a convenient place to produce seed from their sprouts, as observed of the common cabbage, which see.

Third Division.

Comprising the open Coleworts,]—Consisting of the *Brassica fimbriata*, or Borecole—*Brassica fabellica*, or Siberian Borecole, or Scotch cole; with the *Brassica viridis*, or Common Green Colewort—and some other sorts.

The Borecole, and the other plants of this class, are all varieties of Cabbage of the open kind, or such that never close to form a head or cabbage, but always remain quite open

and loose to the heart, all of which possess a peculiar degree of hardness, as almost to bid defiance to the severest winter weather; so a few of them merit culture, to stand as a reserve in case of a severe winter cutting off the other greens.

The varieties of Borecole are] Green Curled Borecole—Red Curled Borecole—Thick-leaved Curled Borecole—Finely-fringed Borecole.

All these varieties of Borecole generally rise each with a thick stalk a yard or more high, surmounted by a large head of thick leaves, in some spreading horizontally every way, which are finely fringed, and curled in a curious manner; others grow more contractedly, and also curled, cut and fimbriated; and in all of which the stems also produce numerous fine sprouts early in spring, closely surrounding the stem from bottom to top; which, as well as the principal or main top head, boil exceedingly green and tender: the main heads come in proper for use in October, November, and any time during the winter; the sprouts early in spring; and as the plants are extremely hardy, I should advise, for the service of a family, to cultivate a proper quantity every year, both for occasional use in the latter end of autumn and in winter; and a portion permitted to stand till towards spring, by way of a reserve, in case of a severe winter cutting off or greatly damaging the other cabbage-greens, as coleworts, favoys, &c.

They are raised from seeds sown annually in March, or not later than the beginning or middle of April for the main crops; or may sow a smaller portion in the beginning of May for a latter crop in succession; all sown in an open situation, not too thick, and raked in; the plants will come up in a fortnight, or probably in less time; a quantity of which, when the leaves are an inch or two broad, in April and beginning of May, should be pricked out four or five inches asunder, to remain four, five, or six weeks to obtain a proper degree of strength for final transplanting, then planted out finally in June and July, for the main crops, into a fully open exposure in rows, two feet or two feet and an half asunder; and finish a late planting early in August, as, if planted later, they will not obtain any tolerable size before winter, planting these in rows two feet apart, and eighteen inches in each row.

In planting these crops it would be of particular advantage to take opportunity of showery weather if possible; otherwise give occasional watering two or three times, until the plants take fresh root.

Those raised from the March and April sow-

sowings, and planted out early in summer, will advance with tall strong stems, and large heads; and the advantage of their large high stems, is, they furnish the greater supply of good full sprouts, which will come out numerously on every side, the whole length of the said stems, as before observed.

Or of those sorts might also sow a small crop in autumn, or the beginning of August, to stand the winter in young growth, for planting out early in the spring, to obtain some of largest full size in the following autumn, &c.

To save proper seed of the above Borecoles, mark some of the best sorts in winter with the main heads continued, and either permitted to remain, or taken up in autumn or winter, or early in the spring, and trenched down in some compartment together in rows, inserting the root and stem well into the ground, as near to the top as convenient—they will run up to stalks in the spring, and produce plenty of ripe seed in July or August.

The Siberian Borecole, or Scotch Cole, is also an open Colewort, and sort of brown Borecole; of which some grow with very tall stems and large open heads, others grow more robust, with shorter stems and larger heads, of large, broad, curly leaves, in some sorts spreading, and some standing erect, sometimes contracting a little inward, but never cabbage; and of which there are different varieties: such as—reddish-brown—dark-red—green, &c. all very hardy for winter; and are raised by the same culture as the Common Borecoles, both in the seasons of sowing and planting; arrive at full growth in September and October; and continue till the spring.

Though these sorts are not so generally esteemed as the Common Borecoles, to cultivate in any considerable crops in gardens; they, however, boil tolerably tender and good in winter, and the stem will furnish young sprouts after the main top head is gathered: so that a moderate supply might be eligibly admitted, by way of variety, to stand for winter and spring eating.

Of the Borecole kinds there are some perennial varieties, with variegated leaves, retained in some gardens as plants of ornament and for curiosity.

Some are also of a perennial, somewhat shrubby nature, rising with tall branchy stems, garnished with leaves all the year, of which some are curiously variegated; and the plants continue of several years' duration: and those with variegated leaves make an ornamental and curious appearance.

These sorts are propagated and continued,

principally by planting off-set slips, and slips of the side-shoots in the spring or summer.

The Common Green Colewort is a hardy, biennial plant, of the open-headed kind; hath a short stem, producing a head of largish, oblong, plane, entire leaves, generally always green, there being but one sort; which, if permitted to have full growth, the head of leaves will grow moderately large, and full in the heart; but never contracts, or forms any head, like a cabbage; is a very hardy plant, and was formerly cultivated in every garden for winter greens, and is the original garden Colewort; but till severely pinched by frost, it is tough and rank-tasted, and, at any rate, never boils so fine and tender as the Cabbage Colewort, for which reason it is rarely cultivated now for table, except by some of the farming gardeners, who raise large quantities in fields for the supply of markets.

On account, however, of its hardiness, it merits culture to stand till towards the end of winter, as a substitute, if the Cabbage Coleworts, and favoys, &c. happen to suffer considerably by severe frost, in which case it may prove a necessary plant.

They are raised, for winter use, by sowing the seed in July, as directed for Cabbage Coleworts, which see.

There is also the Anjou Cabbage or Colewort of the Borecole kind, grows remarkably tall, and produces very large open heads; is raised as the foregoing kinds, but must be planted at a greater distance.

Likewise the Brussels sprouts, or Chou de Milan, a dwarf perennial open Colewort, very productive of sprouts all the year; is raised from seed as the other open Coleworts; also by the perennial roots, the smallest bit thereof will grow and increase exceedingly.

Fourth Division.

4. BRASSICA, *Napobrassica*, (*CaULO-rapa*,) Turnep-Cabbage.

This is a singular variety of Cabbage, having its stalk swelled globularly like a great turnep, and is crowned by a large tuft of leaves, which never close or cabbage.

There are two varieties.] Turnep-Cabbage, with the turnep above ground - Turnep Cabbage, with the turnep under ground.

The plants rise and grow for some time like common open colewort plants, after which the stalk of the first sort begins to swell at bottom, and continues swelling upward, till by degrees the whole is swelled like a very large turnep, which, in the second sort, is almost wholly within the ground; both sorts are crowned by a cluster of open leaves, and they are sometimes used as esculents.

It

It is the globular or turnep-part of the plant that is used, being sometimes sliced in soups, and by some used as common turneps; but unless used when quite young, are intolerably rank and unpalatable, so are principally admitted in gardens as curiosities.

They are however recommended for culture in fields for feeding cattle, particularly sheep; their chief merit is their hardiness, as they will survive the hardest winter.

They are propagated by seeds, sown annually in March, April, and in June; and the plants are in May, June, July, &c. to be transplanted into an open compartment, in rows two feet asunder, keeping them clean from weeds, and draw a little earth about the bottom of the stem, and the turnep-part will be fully grown by Michaelmas, and continue all winter.

Or they may be sown where the plants are to remain, and hoed out to a proper distance.

Fifth Division.

5. BRASSICA (*Cauliflora*) *botrytis*.

The CAULIFLOWER, or clustered Brassica.] Brassica with a clustered central flower-head, rising into many branching flower-stalks.

Varieties.] Earlier Cauliflower—later Cauliflower.

The Cauliflower, as we formerly observed, is supposed to be a variety, accidentally obtained from the seed of some of the sorts of common cabbage, and brought to its present improved state by the effect of diligent culture, which improvement was first of all obtained in the island of Cyprus, from whence the seeds were introduced into the different countries of Europe; and our British gardens now boast the superiority, by exhibiting the plants in greater perfection than most parts of the world.

There is however an apparent specific difference betwixt the common *Brassica* and the Cauliflower, both in their general growth and eatable parts; the cabbage hath broad, roundish, thick leaves, which in the *capitata* varieties being numerous, closely infolding over one another, forming a large close head, and is the only eatable part: but in the *Cauliflora* the leaves are long, narrower, erect, and pointed, not so numerous, and never close to cabbage, remaining always open quite to the heart; and in the centre of which arises a compact collection of many short, young, tender shoots, the rudiments of advancing flower-stalks, crowned with the numerous flower-buds in a close, round, swelling cluster, increasing considerably in size, till forming a large, close, white curdly head, being the cauliflower, and the only or principal edible part of the plant;

and which central head, in its enlarged growth, remaining, for some short time, firm and compact, is then in the most useful state of perfection; but which, after a short period of a few days in full growth, opens, divides, and runs up into many flower-stalks for seed; so that while the head, in its full size as above, remains close, compact, and undivided, is in its best domestic perfection to cut or gather for the table.

From the above difference in the general habit of growth, &c. there is a great apparent distinction of two different species; besides the cauliflower is rather of an annual nature, as if sown in spring it attains perfection, produces flower-heads, and shoots up into seed-stalks the same year; whereas the cabbage is always biennial, never going to seed till the second year after sowing.

In respect to the two varieties of cauliflowers, they are alike in their growth and size, only the early kind will come in about a week before the other, provided the true sort can be obtained, of which however there is no depending, unless you save the seed yourself from the earliest sorts, as is the practice of the London kitchen-gardeners, who are always in possession of an early and later kind, of the former of which they are very choice.

Both the varieties are of a delicate temperature, being, for the general part, too tender to resist the cold of our winter without the aid of occasional shelter of glasses, &c.

Their General Culture.

The principal season of the Cauliflower is May, June, July, and August; however, by performing three or four different sowings and transplantations, they may be obtained from May until near Christmas.

The curious in Cauliflowers generally have three or four different crops annually, i. e. the early summer crop—main summer crop—late summer crop—and the autumn or Michaelmas crop.

The seasons for sowing the above different crops are,

1. The early and main summer crop is sown about the twentieth of August, and the plants rising the same season, are to be pricked out and preserved through the winter under bell or hand-glasses, frames, or in warm borders, &c. as hereafter directed, which being transplanted in spring, arrive at perfection the ensuing summer, some in May, but the principal crop in June and July, and some continue in succession until August.

2. The late summer crop to succeed the above, is sown in February, or early in March, but not later than the first week in April;

April; and planted out in May, as hereafter ordered, which come in for use in August and September, though they will be inferior to the former crop in size and beauty.

3. To have a Michaelmas or autumn crop, another sowing is performed about the 24th of May, which being planted out in July, come in after Michaelmas, arriving to perfection gradually in October, November, and part of December; but the Cauliflowers of this crop are never so large, fair, nor perfectly headed as the summer crops; but as they are always acceptable, it is necessary to have them, and the London gardeners always raise great crops at that season, which they commonly call Michaelmas Cauliflowers.

But we shall proceed to treat separately of the culture of each of the above crops.

First of the early and main summer crop.

As above hinted, the early and main summer crops are obtained from plants raised in autumn, and preserved through winter under bell or hand-glasses, garden-frames, or in warm borders. The time for sowing is, as before observed, some time between the 20th and 24th of August, though the London gardeners are punctual to the 21st day; for as they cultivate large quantities, have by long experience found that to be the most successful period for sowing this crop, which, if sown sooner in autumn, many of the plants are apt to button, as they term it, in winter, or early in spring, that is, they run to flower in their infant state, forming heads in the centre not larger than round buttons, so become useless; and if sown much later, they will not acquire due strength before winter, nor attain due perfection at the proper season; mark therefore the time of sowing as above.

Great attention is necessary to procure good seed, such that is not more than one year old, and that has been saved from the prime sorts.

At the proper time, therefore, prepare a bed of the richest light earth in the full ground in a free exposure, by digging it neatly one spade deep, and break the surface fine; then, directly, either sow the seed on the surface, and rake it in even and lightly; or may first rake the surface smooth, then sow the seed, and sift light earth over it a quarter of an inch thick; or, after raking the bed smooth, may, with the back of the rake, shove the earth from off the surface equally, near half an inch deep into the alley, and then sow the seed; then, with the teeth of the rake, draw the earth back again over the bed with a kind of jerk, to make it spread evenly in every part over the seed, and then with the rake lightly trim the surface smooth.

If the weather proves dry, gentle waterings in an evening are necessary, which will be eligible both before and after the plants appear; and if very hot dry weather, it would be advisable to shade the bed moderately with mats in the heat of the day.

The plants generally appear in a week or ten days; all the culture necessary is occasional water and weeding until towards the latter end of September, when their leaves will be an inch or two broad; then it is proper to prick out a quantity of the best plants, in four feet wide beds of rich earth, in rows three or four inches distance, rejecting all crooked and black-shanked plants, and, as soon as planted, give a moderate watering, which, if dry weather prevails, must be moderately repeated; there let them remain until the end of October, or beginning of November, then must be transplanted into their winter-quarters, some to be planted out finally under hand or bell-glasses for the earliest crop, (see HAND-GLASSES), others into garden-frames, to be occasionally shielded with glasses till spring, then planted out; or, in default of frames, some may be planted close under a south wall, where they will often survive the winter tolerably well:—or, in pricking out from the seed-bed the plants intended to be wintered in frames, they may occasionally be pricked at once into the said frames, to remain, or in beds of proper dimensions to be afterwards defended with frames, &c. either directly, or soon after pricking out the plants, or at the approach of bad weather: this, however may be more particularly eligible, where it happens the young plants in the seed-bed, at the above-mentioned time for pricking-out, are rather small, or of tardy growth, that being pricked at once into the frame-beds, they can have immediate occasional protection of the glasses, if needful; in cold nights, very wet, or other unkindly weather, thereby to forward them in some tolerable strength before winter; but must till then enjoy the full air in all mild dry weather; by the same means, in the above case, the plants for the early hand-glass crop, may be occasionally assisted, to have the plants of proper strength for transplanting under the said glasses by the beginning of November; though this may only be necessary in particular occasions as above.

However, with respect to the early crops, advisable to plant under hand or bell-glasses as beforementioned, the proper time for transplanting them finally to be defended under the said glasses, being the latter end of October, or beginning of November, should, for this occasion, allot a proper compartment of the richest

richest mellow-ground, in one of the best-defended warmest quarters of the kitchen-garden, in a free exposure to the full sun; and let this be well dunged, with the best rotten dung, such as that of old cucumber and melon-beds, or any other of similar quality well rotted; spreading it equally over the ground, at least three or four inches thick; and the whole then regularly trenched one good spade deep, burying the dung equally, then divide the ground into beds a yard wide, with foot-wide alleys between bed and bed, for the convenience of going in to raise, and set off and on the glasses, &c. this done, proceed to put in the plants, allowing three to each glass, though the London gardeners generally plant five: but if they all survive the winter, two of the best is enough to be left to come to perfection; however, at the time of planting them under the glasses, select for that purpose a quantity of the handsomest, straight, clear-thanked plants; these being ready, stretch your line along the middle of the beds, and at every yard distance put in three plants in a triangle five or six inches apart, or, if you plant five, set one in the centre, and the others regularly round it; directly give a little water, and put on the glasses, which keep close about ten or twelve days, when the plants will have taken fresh root; then prop them up on the sunny side about three inches high with forked-sticks, pieces of brickbat, or the like; or it would be convenient to have some wooden pegs about fifteen inches long, one for each glass; each peg having two or three notches an inch or two above one another, to receive the edge of the glass, so sticking them in the ground, one for each glass, and by which the glasses may be readily propped higher or lower on any side, as occasion requires.

During winter, the hand-glasses are to be kept almost constantly over the plants, observing, however, in mild weather, to keep them tilted on props, as above, on the warmest side, for the admission of air; and in fine mild dry days it is proper to let the glasses quite off, which, if your plants are rather forward in growth, should be practised at all opportunities, lest, by too constantly glassing, it draw them into slower untimely, in their small minor growth in winter, whereby the plants would be rendered wholly useless: but always put the glasses over the plants at night; and when cutting winds and frosty weather prevail, keep the glasses close down, only raising them in the middle of sunny days, but when extremely severe frost, keep them as close as possible, and, for the greater security at such

times, it is eligible also to lay some long litter close about the lower part of each glass, raising it higher as occasion shall require: all of which precautions are to be occasionally repeated from the time of planting them under the glasses until spring.

As to their spring culture, in the first place observe, that if all the plants under each glass have survived the winter, they must be thinned the beginning or middle of March, for one stout plant or two at most under each glass is sufficient finally to remain; though in large bell-glasses, the market-gardeners about London frequently leave two or three plants under each, for the sake of having the advantage of the glasses to bring as many as possible to early perfection, which, though smaller than if but one or two, yet by coming in two or three weeks earlier than those planted out, they sell at double or treble the price; but where the size of the Cauliflower is a principal object, should advise to leave but two of the best plants at most under each glass, and transplant the others into another place the beginning or middle of March, according to the temperature of the season, at which time a piece of rich well-dunged ground must be prepared to receive them; when this is ready, proceed to thin out the weakest plants as above, raising them with the point of a trowel, to preserve the fibres of their roots, being careful not to disturb, or leave any vacancy about the remaining plants, observing, if there are any deficiencies, to make them good, in the first place, with some of the best of those thinned out, and plant the rest in the place prepared for them, two feet and half distance each way, and give some water to settle the earth about their roots; but in planting out these plants, it is customary with gardeners, who have occasion to make the most of their ground, to sow a crop of radishes and spinach on the same plat, as directed for the main summer crop.

The remaining plants under the glasses should directly have the earth made good about them, and draw a little mould up about their stems, continuing to cover them occasionally with the glasses, which must be raised considerably on props, in proportion to the advanced growth of the plants, not omitting to let the plants enjoy the benefit of the full air in mild days, also that of warm showers, by setting the glasses wholly off.

Thus the glasses are to be continued occasionally over the plants until the middle or latter end of April, or longer, if it shall seem necessary, either according to the growth of the plants, or temperament of the weather, observing

observing, that, when the plants are so far advanced that their leaves press against the glasses, these should be raised, by forming a border or ridge of earth, round each hole of plants, three or four inches high, on which ridge of mould set the glasses, continuing to prop up one edge occasionally, as before: and according as the plants advance in growth, it is proper to prop up the glasses on every side three or four inches in height; for now, as the length of the days and warmth of the weather increases, the plants will grow freely, so must have as much free air and scope to grow as it is possible to allow them under the glasses, at the same time being careful to expose them also occasionally to the full air, as before observed, in fine days, and moderate warm showers; but continue to defend them with the glasses on nights, and in immoderate cold rains, and all boisterous weather, at least until the weather becomes warm, and the plants are grown too large for the glasses; then let them by degrees be fully exposed night and day, so that by the middle or latter end of April, the use of glasses may be wholly discontinued.

If the weather, toward the middle or latter end of April, and beginning of May, prove hot and dry, moderate waterings will be of utility in promoting the progress of the plants, as well as increasing their size and strength; for it is of importance to have the plants as large and strong as possible when arrived at full growth, otherwise we cannot expect them to produce large Cauliflowers.

About the middle of May some of the forwardest plants will probably shew flower, at which period examine your plants daily; and whenever a flower appears of some little advanced growth, it is advisable to turn down some of the inward leaves over the head to screen it from the sun's rays, rain, and full air, in order to preserve it more effectually white and close; for when fully exposed to the weather it generally changes the fine white colour to a yellowish hue, and occasions the head to open sooner, before it acquires full perfection.

The excellence of a Cauliflower consists not only in the size, but also in the whiteness and compact curdy-like growth of the head; such as assume a frothy loose appearance, are a degeneracy, and are in every respect inferior.

A Cauliflower is in its utmost perfection of growth when the outward parts of the circumference begin to open and expand; after which appearance the whole head soon divides, and shoots up fast for flower and seed: there-

fore watch the opportunity; for a day or two often makes considerable difference.

In gathering or cutting the Cauliflowers, according as they advance to proper growth, the flower-head should generally be cut off with several inches of the stalk adhering, together with most of the surrounding leaves, but these should be trimmed down nearly equal with the circumference of the head, especially if for present use; or if required to keep any a few days after being gathered, and such as are intended for market, should permit the full leaves to continue, and trim them according as wanted.

As the stalks of Cauliflowers never produce any sprouts, as those of cabbages, they are of no use to remain after the head is gone.

Thus far for the culture of the bell-glass crop.

As to the culture of the main summer crop, which I before advised to be wintered in frames, &c. observe the following directions.

These are designed to be protected all winter in frames, &c. in order to be planted out in the spring, to succeed the early crop which were finally planted out in autumn under the bell or hand-glasses; and even where there are no such glasses, it is essentially necessary to raise a quantity of plants in autumn, as before directed, and pricked in garden-frames, to be occasionally covered with the lights during winter, because they will come in much sooner than a spring-sown crop; or, in default of frames, prick a quantity in a bed arched over with hoops to be covered with mats, for, although some may be planted close under the bottom of a warm wall to take their chance, and will frequently struggle through our ordinary winters, yet they are not always to be depended on; and, at any rate, they come in later, and rarely attain the size and perfection of those occasionally protected as above.

Therefore, observing that if the plants were not pricked immediately from the seed-bed at once into the frame-beds in September (to remain for the winter, as before intimated), but at that time were pricked into a nursery-bed in the open ground, to forward in growth for a month or five weeks, they should now be removed from thence and pricked into the beds intended for wintering under frames; so that in the latter end of October, or beginning of November, proceed to prepare a bed or beds of rich light earth, in a dry sheltered situation, fronting the south to the full sun, for one, two, or more garden-frames, longways, raising the surface of the bed a few inches above the common level of the ground,

and rake the surface smooth; then mark out on the bed the width of the frame, or previously place the frame on at once; and prick the plants herein in cross rows three inches asunder, and about the same distance in each row; give a light watering, and directly put on the glasses, and continue them on eight or ten days, when the plants will have taken fresh root, and should then be exposed to the full air in mild dry weather, either by raising one end, or drawing down the glasses considerably, and, by degrees, take them entirely off every dry mild day, but put on every night.

Or in proceeding to prick the plants into the frame-beds at the above-mentioned time, (latter end of October or beginning of November), if they are rather of small growth and weakly, may make a slender-hot-bed of about fifteen or eighteen inches depth in dung, for one or more frames, earthed at top, within the frame, five or six inches thick, and to prick the plants therein; the bed will afford a moderate heat, just to forward the fresh-rooting of the plants, and set them off at first more freely in growth so as to acquire a proper degree of strength, before the commencement of severe weather; and in which bed they are to continue all winter, and managed as above, and according to the following general directions.

During winter, every day in mild, open, dry weather, expose the plants fully to the free air, by shoving the glasses entirely off, which, however, should always be drawn on again towards the evening, as also in time of excessive and incessant rains; though if this happens in the day, and the weather mild, raise one end of the glasses on props three inches high, for the admission of plenty of fresh air; for the plants must not be kept too close in mild weather, which would run them weakly and tender, or forward them too much in growth, and force them into small button flowers at this season, as observed of the hand-glass crop; so let them have the full air, as above, in all mild dry days, as they only need protection from frost and immoderate rains; observing also, during their residence in the frames, to pick off casual decayed leaves, and search for slugs, which often attack these plants in this season, both in frames and hand-glasses, and devour their leaves.

In frosty weather continue the glasses always on close to protect the plants; and if the frost is severe, give additional protection by covering the glasses at night with dry long litter, or garden mats: also if the frost proves very rigorous, lay some long litter likewise round the outsides of the frame, and augment

the covering over the glasses, to continue night and day in extremely severe weather; or only uncovered in the middle of a sunny day, two or three hours; but as soon as the weather changes moderately mild, give the plants full light, and admit air agreeably to the foregoing observations.

Towards the spring, in open mild weather, inure the plants by degrees to the full air, by taking the glasses off entirely every day, and gradually leave the plants fully exposed at night in the more advanced part of the spring, the latter end of February, or in March, according to the temperature of the season, so as to harden them in some degree for removal or final transplantation into the places where they are to remain to acquire full growth, as hereafter directed.

In default of frames, &c. as above observed, you may, at the before-mentioned time, prick a quantity of plants in a four feet wide bed in a sheltered situation, which arch over with hoops or rods; so on nights and all bad weather cover with large garden-mats, and in severe weather also with litter.

Likewise in the above cases of the want of frames, &c. a quantity may be pricked on a south border close under the wall, &c. and in default of other covering, they may be lightly covered in severe frost with dry long litter, by which assistance the plants will often survive the winter, and, at any rate, will come in earlier than spring-sown plants.

In the latter end of February, or beginning, middle, or latter end of March, or beginning of April, according to the temperature of the weather, and condition of your plants, all those wintered as above, either in the frames, arched bed, or warm border, are to be planted out, where they are finally to remain. Make choice of an open spot of the best ground, which should be previously dunged and dug, as directed for the early crop, and in which plant the Cauliflowers by line two feet and half distance every way, and give water at planting; and, if dry warm weather, it will be proper to repeat the watering two or three times till the plants have taken fresh root and discover a renewing growth.

In planting this crop of Cauliflowers, the market-gardeners, and others who have occasion to make all possible advantage of their ground, generally sow a thin crop of radish and spinach in the same compartment, between the rows of Cauliflower plant; or the general method is to sow them a week or fortnight before planting the Cauliflowers, mixing the radish and spinach seed together, and sow it broad-cast over the general surface, and raked in

in regularly. The radishes and spinach will come in for use in May, and be mostly all gathered by that time the Cauliflowers begin to advance considerably in growth.

Observe, however, in May and June, when the Cauliflower plants have attained some advanced state, and weeds rising numerous, the ground should be well hoed, cutting down all weeds, and draw earth about the stem of the plants; and if the month of June proves very hot and dry, occasional waterings will be of great utility, forming basons round each plant for that purpose; and in July this crop will be in full perfection, continuing in succession until the middle of August, when they will be succeeded by the late summer crop.

The culture of the late summer crop is—

In order to keep up a regular succession of Cauliflowers through the summer, it is necessary to raise a proper supply of plants in spring, to be planted out in the latter end of April, or in May, which will arrive at perfection in August and September, in due time to succeed the autumn-raised crop.

This crop may be sown any time in February, but not later than the first or second week in March; and, in order to forward the plants as much as possible, it is proper to sow the seed in a hot-bed of slender structure; let the hot-bed be made for a one-light box about eighteen or twenty inches depth of hot dung, covered with light rich earth four or five inches thick; sow the seed on the surface, and cover it a quarter of an inch deep with fine mould; put on the glass, and give occasional light sprinklings of water, raising the glass daily, for the evaporation of the steam, and admission of fresh air, and the plants will rise in a few days, at which time admit air freely by tilting the glass, and by taking it wholly off in fine warm days and moderate showers; and in dry weather give frequent light waterings. When the plants have leaves an inch broad, it is proper to prick them out; and if some are then pricked upon another hot-bed of moderate temperature, it will forward them considerably. In default of frames, may sow the seed and prick the plants on a hot-bed of the above substance, defended in cold nights and bad weather with mats or hand-glasses; or, for want of a hot-bed, may sow the seed, &c. on a warm border, and cover occasionally, as above.

About the latter end of April, beginning, or middle of May, some of the forwardest plants will be fit to transplant for good, which should be in an open spot of rich well-dunged ground, as directed for the former crops, and in dry weather should have frequent refresh-

ments of water till they have taken good root; their further necessary culture is only occasional hoeing to kill weeds, and when the plants are somewhat advanced in growth, draw some earth about their stems.

The culture of the Michaelmas crop is—

To have Cauliflowers after Michaelmas, and to continue from October till near Christmas, is, as already observed, effected by sowing about the 24th of May on a bed of common earth; and when the plants have leaves an inch or two broad, prick them out three or four inches asunder, to remain until the middle or latter end of July; then transplant them finally, as directed for the other crops, supplying them occasionally with water till rooted; they will begin to shew heads towards the end of October, which will continue coming in gradually all November; and if the season proves mild, they often continue great part of December, or sometimes in mild weather till Christmas.

This crop depends greatly on the temperature of the autumn after Michaelmas, which if moderately dry and warm, we often have tolerably large handsome Cauliflowers in November; but if very wet and cold, the heads, for the general part, are small, irregular, ill-coloured, and insignificant.

Saving the Seed of these Plants.

Every gardener who cultivates any considerable quantity of Cauliflowers, should be particularly anxious about saving his own seed from the most perfect sorts, as those who save great quantities for sale are not over careful in that point, which is the reason we often meet with so many irregular, ill-coloured, frothy, loose, and other spurious kinds, in private gardens, to the great disappointment of many gardeners.

Some of the earliest sorts of the bell or hand-glass crop are to be selected for seed; for those of the succeeding crops are rarely forward enough to ripen any; the most perfect, largest, compact, firm, white heads, are to be marked, and permitted to remain in the same place to run up to stalks, &c. which they will effect in July, when they will also flower, or in the beginning of August, and perfect seeds in September; observing, when the flower-stems are considerably advanced, to place three stakes triangle-ways, for the support of each plant; and by encompassing the stakes with pack thread, or other tying, it will effectually secure the stems, and all the lateral branches, in their due position, which is all the culture necessary, unless the weather proves very dry after the seed-pods are formed, when some moderate waterings all over the

plants will be very serviceable, not only in the growth of the seed, but also in preserving it from the mildew, an infection which often attacks these plants so severely in their seeding state, as either totally to destroy the greatest part of the seed, or retard its growth so much, that it never ripens perfectly, and is the reason of good Cauliflower-seed being often so dear, which in the shops is frequently sold from two to four shillings per ounce.

In the middle of September the seed will begin to ripen, though in cold wet autumns it is sometimes Michaelmas before that is thoroughly effected; observing, at this time of the seed beginning to ripen, should be very careful to watch the birds; for as all other similar seeds ripen sooner and being now generally all got in, the green-finches, chaffinches, and other small birds, will attack this the more numerously, and make great devastation, if not prevented as much as possible, by placing scare-crows, and frequently attending to chase them away; for which, the London gardeners, who raise considerable quantities of this seed, generally have a boy or two constantly attending from early in the morning till evening.

According as the seed advances to perfection, should be careful to cut off the branches on which it is produced, from time to time, as it attains maturity, for the seed does not all ripen together; so tie it in bunches, and hang it in the sun to harden, then beat it out, and put it up in bags for use.

A fresh parcel of seed should be saved annually; for this seed is not to be depended on when more than one year old, though two year old seed will frequently grow.

Sixth Division.

The Broccoli is another supposed variety of the common cabbage, though, if we admit of the cauliflower as a distinct species of *Brassica*, the Broccoli is more apparently related to that species than the cabbage, so that we have reason to suppose all the sorts of Broccoli varieties of the *Brassica Cauliflora*, as the plants, both in their general growth, habit, and eatable parts, greatly resemble that species; for, as we observed of the *Cauliflora*, all the varieties of Broccoli form roundish heads in the centre of their leaves, composed entirely of a compact collection of numerous buds or ends of advancing shoots, and which, like the cauliflower, are the chief eatable parts of the plant; that being used while they remain in a compact firm head, are most excellent eating, but after having attained a certain state of growth they divide, assume a seedy-like appearance, and soon fly up to stalks for flower and seed.

There are several varieties of the Broccoli, as purple-headed, blue, brown, green, black, and white, each described as below; all of which are annual-biennial plants, as they both attain perfection the same year in the early-sown crops, and later sowings stand till the second season, then, after producing their heads, shoot up to stalks, ripen seed, and then wholly perish.

They are cultivated principally for autumn, winter and spring eating, these being the general seasons of their production in best perfection, though the spring heads are generally superior in size, being obtained in the different crops, by a spring and summer sowing in March, April and May; those of the two former months' sowing generally furnish heads in autumn and winter, October, November, December, &c. and that of the latter principally after Christmas, and all the spring months, in which they are commonly rather superior to the foregoing in the production of larger perfect heads, in greatest perfection in February, March and April; but as a regular succession may be obtained from Michaelmas until May-day, and being the most excellent winter and spring vegetables of our gardens, their culture highly merits our nicest attention, to obtain a regular supply during the above period.

All the varieties are hardy enough to resist the cold of our ordinary winters, though very severe frost often affects such that are weak or grow in exposed cold soils, but more particularly the sort called Cauliflower-Broccoli, as was the case last winter, (1795) when almost all the sorts of Broccoli were killed by the frost.

6. *BRASSICA Italica*, Italian *Brassica*, commonly called Broccoli.

The principal sorts, and their respective varieties, are,

1. *Early Purple Broccoli.*] A moderate-growing darkish-green plant, producing smallish purple heads, but comes earlier by a fortnight or more than any other, and of which there are, the purple, the green, and the blue, all often rising from the seed of the same plant. This sort is proper for the first crop, which, if sown the latter end of March, or more generally in April, and a succession crop in May, and planted out in June and July, come in for use from Michaelmas till Christmas; and when the heads are gathered, the stalks produce plenty of fine sprouts of excellent eating.

2. *Late Purple Broccoli.*] A large, robust-growing, darkish-green plant, producing a large purplish head like a cluster of buds, being generally much larger and more perfectly headed

headed than the former sorts, and is very delicate eating, of which there are, the common Purple-headed Broccoli—Dwarf Purple Broccoli—Blue Broccoli—Brown Broccoli—Green Broccoli—Yellowish Broccoli—all of which frequently rise from the same seed, though that of the true purple kind is superior both in size and perfectness of heading, as well as delicacy of eating: and with care in saving the seed, the sorts may be continued; and this, and all its varieties, by sowing in April, May, and beginning of June, and planting out the plants in July and August, may be obtained for use from about Christmas until the beginning or middle of May, but are always in greatest perfection in regard to size in February or March and April; and after the main head is cut, the stalks produce abundance of side shoots or sprouts, terminated by small heads, which eat as sweet and tender as the main ones.

3. *White, or Cauliflower-Broccoli.*] A very curious variety of Broccoli. The plants are of robust growth, and lightish-green colour, each forming a close white head in the centre, sometimes as large as a middling cauliflower, and greatly resemble them in every state of growth, and for delicacy of eating equal to the finest summer cauliflower whatever. This sort admits of no varieties, except in different degrees of whiteness, though the whitest generally assumes somewhat of a yellowish hue; by sowing seed in March, April, and May, and planting out the plants in June, July, and August, you will obtain heads for use all winter and spring; but those that appear about March, and beginning and middle of April, are considerably the largest and fairest heads. The stalks of this sort rarely afford any sprouts like the purple kinds.

4. *Black Broccoli.*] A tall-growing plant of a blackish-green colour, which, for the general part, produces smaller and less perfect heads, being somewhat open and seedy-like, but possesses the property of being so hardy, as seldom to be injured by the severest frost. There are of this the Black or Dark-headed Broccoli, the Brown, and the Blue, all sometimes from the same seed, and are proper to cultivate to stand the winter, by way of reserve for spring service, sowing the seed early in May, and planting out the plants in July and beginning of August.

Their General Culture.

All the varieties are propagated by seed annually in the common ground, sowing them in spring and early part of summer in an open situation, and the plants to be transplanted into

an open exposure, as hereafter directed, to grow to perfection.

The principal season for sowing the main general crops of all the varieties of Broccoli is March and April for the autumn and winter production, and May and beginning of June for the principal successive crops, to come in for general spring supply from December or January or February till April or beginning of May.

Or may occasionally sow some so early as February or beginning of March of the Cauliflower Broccoli; as also any of the Purple kinds, whereby to obtain an earlier autumn production of small heads in the latter end of August, or in September and beginning of October.

So that from the above times of sowing we may obtain different crops of Broccoli advancing progressively in regular succession six or eight months; the plants raised from the different sowings being planted out finally in summer, in June, July, and August, &c. into open compartments of good ground two feet to two and a half distance, they advance to perfection in full growth and gradual successive production of good middling heads in October, November, and December, &c. of the March and April sowings, continuing coming in all winter, if open weather; and these are succeeded by the later-sown plants arriving to production in January, February, March, and April, and which generally attain superior perfection in the size of the heads, especially those of the principal successive sowings at the time above mentioned.

Therefore observing that, agreeably to the above intimations, this Broccoli may be sown in two or three successive crops of the different sorts, according to the times they may be required in perfection, as for instance to obtain a production of heads in October, November, December, &c. may begin to sow some both of the early and late Purple kinds and the White or Cauliflower Broccoli, the beginning or any time in March and beginning of April; or for the more general principal crops, may perform a larger sowing any time from about the 20th of March to the 10th or 15th of April, and about the beginning or middle of May, by which you will obtain the greater chance of succession and variety; the early Purple will come in first, and they will be regularly succeeded by the others; but for the main spring crops, to come in for use in January and February, and continue in succession until May, the season for sowing them is from about the fifteenth of April until the middle or latter end of May, generally performing

forming a sowing in each of those months to arrive to production in regular succession; and, for which crops, may sow both of the Purple kind and Cauliflower Broccoli; and likewise, at the same time may also sow some of the Black Broccoli, to stand by way of reserve, in case the others are injured by the winter's frost; and if you would continue a longer succession, a third sowing may be performed the end of May, or beginning of June, particularly of the late Purple and Cauliflower Broccoli.

By observing the above different times of sowing the seed, a succession of Broccoli may be obtained for use from September or October until the middle of May.

The seed, as before observed, should be sown in an open exposure, where the plants will rise much stronger than on narrow borders, under walls, &c. Sow each sort separate, scattering the seeds moderately thick on the surface, and rake them in lightly; the plants will come up in ten or twelve days; give occasional waterings in dry weather, and when they have leaves an inch or two broad, it is proper to prick out a quantity of the best in a nursery-bed three or four inches apart, giving water as soon as planted, and occasionally till they have taken root, in which bed let them remain a month, or five or six weeks, where they will acquire due strength: their stalks will be short and of robust growth, and will hereby be considerably better prepared for transplanting where they are finally to stand, than those which remain in the seed-bed.

The time for transplanting them where they are finally to remain, is June, July, August, and beginning of September, according to the time they were sown, or are desired for use.

The plants should have an open situation, and as good ground as any the garden affords, which, if it has the addition of dung, will be a particular advantage, digging it in neatly one good spade deep, and directly put in the plants, for which work a moist time would be highly beneficial; they are to be planted in rows two feet and half asunder, and two feet distant in the lines; but for those planted late in August and September, two feet at most between row and row is sufficient, and eighteen inches distant in the rows. Let them, as soon as planted, be watered; and if dry weather prevail, repeat the watering every other day, till the plants have got root, which work should be particularly attended to in transplanting these plants.

After the plants have taken root and begin to grow, their further culture is to keep them clear from weeds, by hoeing the ground occa-

sionally, and when they have advanced a little in growth, draw some earth with an hoe about their stems, which work of earthing, if repeated once or twice, will be of singular advantage to the plants; it will promote their rooting more firmly in the ground, and encourage their progress of growth, and greatly forward them, so as to acquire due size and strength before winter, which is very essential; for if the plants do not by that time arrive to a tolerably large growth, they will yield but small and trifling heads.

Some of the earliest plants will probably shew heads for use in the end of September, but more generally in October and November, which however are rarely so large and fine as those that appear towards and after Christmas.

Previous to gathering the Broccoli for use, attention must be had that the heads be permitted to have their full growth, which, however, should be cut while they remain close, and before they begin to divide and assume a seedy-like appearance, and should be cut with about six inches of the main stalk to each head; for the upper part of the stalk eats exceeding sweet and tender, which, previous to its being dressed, must be peeled or divested of the outer rind, and which, when dressed, as well as the heads themselves of the Purple and Black Broccoli, always assume a fine green colour; but the Cauliflower-Broccoli retains its natural whiteness, which if boiled in a clean linen cloth, as sometimes practised for cauliflowers, it will preserve the heads compact, firm, and more delicately white; and will not be inferior to the best cauliflower in goodness of eating, when served to table in the same manner.

After gathering the main heads of all the sorts of Purple and Black Broccoli, the stalks should be permitted to remain for the production of sprouts or smaller heads, which they will afford plentifully, and which are as fine eating as the principal heads; but as to the Cauliflower-Broccoli, the stalks afford but very few sprouts or side-shoots.

Of saving the Seed of the different Sorts.

When it is intended to save the seed of Broccoli, some of the largest and most perfect heads of the respective sorts of those which appear in February or March should be marked when in perfection, which of the first and second sorts, those only of the best purple colour and close knobby-like heads should be selected; and of the cauliflower or white sort, those that have the largest, closest, and whitest heads, are to be chosen; and of the black kind, always chuse those with the largest, most compact,

compact, and darkest-coloured heads; all of which should remain untouched, only taking off the side-shoots, so leaving only the principal head to shoot up for seed.

To preserve the principal varieties as pure in their kind as possible, the seedling plants of the different sorts should be at a considerable distance, lest they fecundate each other, and occasion a degeneracy.

Those persons who cultivate purposely for seed should sow in the end of April or beginning of May, and plant them out in July; and the following spring, when they shew their heads, pull up all those that are degenerated, or vary from their respective kinds, which should be punctually attended to, otherwise it will be impossible to preserve the sorts.

All the sorts generally ripen seeds as plentifully as any of the sorts of cabbages.

The plants generally run up to stalk in April or May, flower in June, and the seed ripens in August, which is to be managed as directed for that of cabbages, favoys, &c.

Seventh and last Division of Brassica.

7. BRASSICA RAPA, the Turnep.

The Turnep, as we have already observed, is a distinct species of *Brassica*, or Cabbage, which till lately was always ranged as a separate genus, under the title of *Rapa*; but its general characters being the same as *Brassica*, modern botanists have now ranged it as a species of that genus.

Class, order, and characters, the same as *Brassica*.

The botanists allow but one distinct species, which however furnishes several eminent varieties, all of which are annual and biennial; as, if sown early in spring, they attain perfection, run up to flower, ripen seed, and totally perish the same year; and sown in summer and autumn, they also attain perfection the same seasons, and stand without running to stalks till next spring; then wholly run for seed, and terminate their growth finally in autumn.

The species is,

BRASSICA RAPA.

Rapa, the Turnep.] *Brassica* with a large, orbicular, depressed, fleshy root, crowned by many long, rough leaves, and when the plant spindles, rises with a strong, erect stem three or four feet high, dividing into many branches, covered with numerous yellow flowers in May and June, succeeded by plenty of ripe seed in July or August.

Varieties of this are,

1. *Early Dutch Turnep.*] An orbicular, moderate-sized, handsome, white Turnep, valuable for its early perfection, very sweet and tender while young, and a very fine garden

Turnep for the early and summer crops, though when old it is apt to become stringy.

2. *Early White Stone Turnep.*] A round, moderate-sized, neat, white Turnep; comes early; and is very good in its young and middling growth: proper to sow in gardens, for an early and first general crop.

Varieties.] Large later Stone Turnep—Early Red Stone Turnep.

3. *White Round Turnep.*] A globular, large, white Turnep, proper both for the garden and field culture, and succeeds the two former sorts in its time of attaining perfection.

4. *Green-topped Turnep.*] A large round Turnep, remarkable for having its outer coat green at top, and great part of the root growing above-ground; is exceeding tender and palatable eating at almost every period of its growth, obtaining in size from about four to eight or ten inches diameter, though, when allowed considerable room to grow, it often arrives at a much greater magnitude, and is excellent for the general crop in gardens, to draw for the table when moderately young or of middling growth; and is valuable to cultivate in fields for feeding cattle.

5. *Red-topped Turnep.*] A large globular Turnep, having its outer skin red at top; a fine, soft, sweet-eating root; and as it acquires a very large size, is also particularly well adapted for field-culture.

6. *Yellow Dutch Turnep.*] A moderately large, and frequently oblong Turnep, the skin and flesh of a yellow colour; is tolerably sweet and palatable eating, though the colour renders them disagreeable to some, whilst others esteem them equal to any of the other varieties for the table.

7. *Oblong White Turnep.*] An oblong, largish, white Turnep; strikes considerably into the ground, often assuming the form of some parsneps; boils soft and sweet while young, but soon becomes stringy and rank-tasted.

8. *Tankard Turnep.*] An exceeding large, oblong-cylindrical, thick Turnep, of quick growth, with the root generally standing considerably above ground; and which in a middling young state boils tender and good, though it is not essentially proper for any principal crop in gardens, as some of the other sorts; but is a good field Turnep.

9. *Large Norfolk Turnep.*] An exceeding large, round, white Turnep, most generally cultivated in fields for cattle.

10. *Hardy Russia Turnep.*] A middle-sized, dark-coloured Turnep: remarkably hardy to endure severe weather, and continues long in spring without running: proper to sow in a moderate

a moderate garden crop for winter and spring.

11. *Long-rooted French Turnep.*] A long, small, spindle-rooted Turnep, of but little merit except for soups, and should be used while young, otherwise it becomes stringy and hard.

12. *Purple Turnep.*] A roundish, small, early, purple-coloured Turnep, considered more as a curiosity, than for any economical purposes.

There are some other varieties of less consideration; and it may be observed of those here enumerated, some are preferable to others for principal culture.

Of the above varieties, therefore, the first four or five sorts are generally the most preferable for garden culture; though any of the other kinds may also be cultivated occasionally; even the larger sorts, when in young or middling growth, are good for use in a family; but the larger sorts, however, are more commonly esteemed for field cultivation for sheep and cattle; and those of moderate or middling sizes are the most estimable for general culture in gardens, both for the supply of a family and for markets; and of which the early Dutch Turnep demands notice for the early and first general summer crops, as it generally arrives to perfection, or of proper size for drawing, a fortnight at least sooner than most of the other varieties; and, by an early sowing in spring, may be obtained the beginning or middle of May, when about the breadth of a half-crown piece; thinning out some by degrees, the others will increase in size, gradually, to full growth: next to this is the early stone Turnep, for an early and first general summer crop: and the common round white Turnep is eligible to sow for a main summer crop of a larger extent; all of which may be continued in good perfection all summer and autumn, by performing three or four different sowings from March until July, so as to have crops of young roots succeed one another regularly; but for the autumn and winter crops, the white round Turnep, the green-topped, and the red-topped kinds, are the hardiest, and very fine family Turneps, though the green-topped sort claims precedence for sweetness of eating, as well as durability of perfection; likewise, as the three last-named varieties attain considerably the greatest magnitude, they are to be preferred to all the others for field-culture, for the feed of sheep and black cattle in winter, and spring; and for the general supply of table in autumn and winter, it is eligible to cultivate a good crop of the white-round, or green-topped kinds, &c. by sowing at the seasons hereafter directed.

Turneps may be obtained for use eight or ten months in the year; that is, from about the middle of May, until the beginning or middle of March, after which time they begin to shoot up into stalk for seed; and although the roots are often continued for use until the latter end of April, yet they, after the month of March commences, soon shoot, become stringy, dry, hard, and very indifferent eating for the table.

General Culture.

The propagation of all the varieties is by seed in an open situation, in the place where the plants are to remain, for they are never transplanted like the preceding species of *Brassica*.

The season for sowing is any time from the beginning of March until the latter end of July; though, to have a long and regular succession for the table from the earliest to the latest period, it is necessary to perform four or five different sowings at proper intervals, from the middle or latter end of February until the middle of August, observing it is not advisable to sow earlier than the middle of February, because the too early sown plants would fly up to seed the same year before the roots apple, or at least, attain a quarter their usual size; indeed, even those sown any time in February are very apt to run; but those sown in March more generally stand longer before they shoot for seed; and the April sowings will continue still longer without running, and acquire a greater degree of perfection in size before they push up to stalks, or probably not at all, especially those not sown before the middle or latter part of that month; and generally all those sown after that time, in May, June, July, &c. wholly stand without running the same year, and attain full growth in summer and autumn; and as to the main greater crops for autumn and winter, they being generally sown in June and July are obtained in full perfection, from August or September, and October, throughout the winter till spring following; or a smaller final crop sown in August come in for later standing Turneps in the spring: but this crop should generally be sown in the first or second week, or by the fifteenth or twentieth of that month, as above noticed, otherwise the roots will not have sufficient time to grow to any tolerable bigness before the winter's cold puts a period to their growth; it is, however, proper to sow late as well as early for family use; and, although the roots will not acquire any considerable size, they being reserved for spring, stand three or four weeks longer before they run, than those of the summer-sown crops;

crops; by which means we obtain them so much the longer for the table.

But for the general summer, autumn, and winter crops, the principal periods for sowing are April, June, and beginning of August, as before observed; though, where a constant supply of young roots are required, sowings may be performed in any of the intervals between these times, or those before mentioned.

An open situation, and a moderately light soil, is the most eligible for the culture of Turneps; as, in confined places, they draw up greatly to tops, and form but inconsiderable roots, and in strong land the roots frequently acquire a stringy texture, and rankness of taste.

The necessary space of ground to sow at a time for the supply of a family is from about two to six, eight, or ten rods, making the calculation according to the extent of the family.

The proper quantity of seed for each sowing in private gardens, for the supply of a family, may be from one to two or three ounces, or less; and for large field crops, the common allowance is generally at the rate of about two pounds to an acre; so the calculation is easily made for a smaller or larger extent of ground.

The ground is to be prepared for the seed, by digging or trenching it one spade deep; and the seed should, if possible, be sown while the ground is fresh stirred, especially in summer, when it is hot or dry weather: but a moist season for summer sowing is of great importance in the culture of Turneps, for reasons hereafter explained: the seed is to be sown broad cast on the general surface, scattering it moderately thin with a regular cast, and even-spreading hand, and directly tread it in evenly, and rake the ground. Thus far is the method of sowing Turneps in gardens; but in the field culture, the plough, harrow, and roller, are used. See the *Field Culture*.

This seed being of quick germination, the plants appear in a few days after sowing, especially in moist weather; and in eight or ten weeks after they appear, we may expect Turneps fit to draw.

As we above observed, a moist season is of great advantage in sowing the general crops of Turneps in summer; and should not omit that opportunity when it occurs favourably at the proper time, either moderately showery, or in great prospect of rain, or immediately after, if possible; or, however, not to omit the proper season, sow while the ground is fresh turned up and a little moist, which promotes a quick germination in the seeds, and free growth in the young plants; for when they come up freely, and continue a luxuriant growth, it

secures them from the fly, which, in very dry weather, when the plants rise straggling, and grow stuntedly, while in the seed leaf, often proves a mortal enemy to these crops, frequently destroying whole fields of them in a few days; but when the weather is showery at their first appearance, the plants advance so fast in growth as soon to be in the rough leaf: when the plants are a little advanced, they may be considered to be past danger; so that the greatest danger is the first week or fortnight after the plants come above ground: therefore in gardens, where there are only small quantities, it would be highly beneficial to water them plentifully at that period of their growth.—Many receipts have been recommended to prevent the attacks and devastations of this common enemy to our Turneps, such as steeping the seed, previous to sowing it, ten or twelve hours in water, wherein has been boiled or infused a good quantity of tobacco-stalks and dust, mixing therewith flour of brimstone, foot, juice of hepatic aloes, &c. also by strewing foot or lime over the ground after the plants come up, likewise drawing elder branches along the ground, over the young plants, the effluvia of which often prove noxious to these small devouring insects; which expedients frequently have some effect, though far from being infallible; for, in spite of all the methods, the fly will often devour whole crops, if ever so considerable; and when this is the case, nothing more can be done than to prepare the ground, and sow it again as soon as possible.

As to the general culture of Turneps, the plants, as before observed, are always to remain where sown; and all they require is, when about a month old, to be thinned to from about six or eight to ten or twelve inches distance, and cleared from weeds; which work of thinning, &c. is the most effectually done by the hoe, and is called hoeing Turneps.

This work of hoeing Turneps is to be performed when the plants have two or three leaves about an inch broad, which should always be done in dry weather, (see HOEING), having a common garden hoe, three or four to five or six inches broad, with which cut down the superabundant plants, singling out the others to about six or eight inches distance, which may be room enough for the crops of Dutch Turneps, and others of similar moderate growth; though the larger sorts, and if to stand to have full growth, should be thinned at least about eight, to ten or twelve inches; observing at the same time in general, as you proceed in the hoeing and thinning the plants, to cut down all weeds,

and stir every part of the ground; for this proves highly beneficial to the growth of the crop; and if the work is properly performed in dry weather, the cut-down weeds and superabundant plants will be more effectually destroyed, and the plants will require no further culture; for they, after the operation of hoeing, will advance so fast in growth, that their leaves will soon spread and cover the ground, so as to stop the future progress of weeds.

With respect to the above distances of thinning the Turneps, it is principally to be understood of such as you intend shall grow to a tolerably large size before any is drawn; but as to the earliest crop, they need not be thinned to more than five or six inches distance, especially if it is intended to begin drawing them as soon as they begin to turnep of some moderately small size, as frequently practised, gradually thinning out the largest for use; observing, however, always to thin them regularly at first, as above, at the time of hoeing.

In three or four weeks after hoeing, the plants will begin to turnep; and in five or six weeks, some will be fit to draw young for use: but it will be two months from hoeing before they attain tolerable perfection, though, as above observed, we often begin drawing the earliest crop as soon as the roots begin to turnep, which, although not larger than middling walnuts, are always highly acceptable at an early season, as a rarity at table; they also sell well at market, and those of London are generally supplied with them so early as the beginning of May.

The quantities of these roots consumed for family use almost the year round, in London and its vicinity, are amazing, when we survey the vast crops in the extensive garden-grounds and fields eight or ten miles round the metropolis; also Covent-garden, and the other gardener's markets of that city, early in a morning, to see the prodigious quantities that are daily brought by cart and waggon-loads, all clean-washed and neatly bunched, from about twelve to fifteen or eighteen, &c. according to their size, in each bunch, and which the gardeners sell to the retailers by the dozen of bunches.

Of the Field Culture.

In the field culture of Turneps for autumn and winter service, either for the supply of markets or for feeding cattle, the common season for sowing is any time from the beginning of June till the middle of August.

The ground is to be prepared for the seed by proper ploughing, and should also be once or

twice well harrowed, to render the surface level and fine, that the seeds, when sown, may be more equally covered; the seed is then to be sown immediately, allowing not more than a pound and half or two pounds to an acre, sowing it by broad-cast, and directly harrow it in with a short-tined harrow, and afterwards roll the ground with a large wooden horse-roller to smooth the surface, and the seed will thereby be covered more effectually, the plants will rise more regular, and it will be much easier to hoe them, than if the surface is left rough.

When the plants have leaves an inch or two broad, they are to be hoed in dry weather, to destroy weeds, and thin the plants to about ten or twelve inches distance, as before observed; but when it is designed the roots shall grow to their utmost size for feeding cattle, it is proper to set them out to about fifteen inches distance at least.

The crops of the above times of sowing come in for use in September, October, and November, and continue good all winter, either for the table, or for feeding, at which time they are admirable food for sheep and cattle, and are excellent for milch-cows, for which purpose the cow-farmers about London use vast quantities, many of whom have several hundred cows; but as their land consists chiefly of grass, they buy whole fields of them of the ploughing-farmers ten or fifteen miles round the city, and bring them home in waggons, and give them to the cows whole, which they eat greedily, to the great increase of the quantity of their milk.

Saving the Seed.

To save Turnep-seed, a due quantity of the roots of the autumn or winter crops may be permitted to stand where they were raised; and they will shoot up in March, and produce plenty of seed in June, July, or August, without further trouble; but if you are curious to preserve the different varieties in as great perfection as possible, it is advisable in February to transplant a quantity of the finest roots of each sort in separate pieces, at a distance from each other, placing them in rows two feet asunder; and the necessary culture is, to hoe the ground occasionally to destroy weeds, and to watch the birds when the seed begins to ripen, which will be in June or July, and some time in these months, or beginning of August, will be fully ripened, when the stalks should be cut up from the bottom; and after it has been exposed to the sun a few days to dry and harden, thresh it out, and put it up in bags for use.

BROMELIA, the ANANAS, or Pine-Apple, and the PENGUIN, or Wild Ananas.

This genus comprehends most curious exotics

tics for the hot-house, herbaceous perennials of robust aloaceous-like growth, rising with numerous, long, erect, sharp-pointed leaves from the bottom; in the midst an erect stalk from one to three feet high, crowned by an oblong-ovalish fruit; and being natives of the hot parts of Africa and America, they consequently, in this country, require the constant shelter and temperature of our best stoves.

Class and order, *Hexandria Monogynia*.

Characters.] CALYX, a small, trigonous, three-parted, permanent cup. COROLLA, three small, narrow, erect petals, having at the base a three-parted nectarium. STAMINA, six short filaments, inserted into the receptacle, crowned by sagittated antheræ. PISTILLUM, a germen below the receptacle, and filiform style, surmounted by an obtuse bifid stigma. PERICARPIUM, a large, roundish, umbilicated, baccaceous fruit, furnished with numerous, small, oblong, obtuse, smooth seeds, which in the Ananas are lodged in the knobs or tubercles of the fruit.

There are of this genus four or five species, the principal of which is that celebrated plant, the Bromelia Ananas, which produces the so much admired fruit the Pine-Apple, and which now constitutes the principal furniture of most of our hot-houses, for the sake of the said fruit, which certainly deserves the appellation it has universally obtained, that of king of fruits, as, in beauty, delightful fragrance, and deliciousness of taste, it greatly surpasses all other fruits of the world.

The species are as follow: and first of the Pine-Apple and varieties.

1. BROMELIA Ananas.

The Ananas, or Pine-Apple Plant.] Bromelia with a thick, fibry, perennial root, crowned by many long, erect, narrow, serrate-prickly-edged, sharp-pointed leaves, growing two or three feet high; from their centre a robust round stalk, supporting at top a large, oval-oblong, erect fruit, composed of numerous tubercles, and beautifully adorned at top with a crown of leaves; and the fruit in its advancing young growth produces many small bluish flowers, rising singly from all the knobs or tubercles; and as the flowers fade, the fruit enlarges, becomes a fleshy substance, and as it ripens, assumes a golden colour, imparting a most fragrant odour.

Of the above species are several varieties, differing in the shape, size, and colour of their fruit, &c.

The varieties of note are,] Oval-shaped Pine-Apple with whitish flesh, or Queen-Pine—Pyramidal, or Sugar-loaf Pine-Apple with yellow flesh—Green Sugar-loaf Pine-Apple—

Black Antigua, or Ripley Pine-Apple—Olive-green-fruited Pine: superior flavoured—King-Pine; a large fine fruit; shining-green leaves, almost spineless—Granada-Pine with marbled leaves and very large fruit—Bogwarp-Pine with broad green leaves—Smooth, long, narrow-leaved Pine—Gold-striped-leaved Pine—Silver-striped-leaved Pine.

Of the above varieties there are two principal sorts in esteem amongst us in England, which are the two first-mentioned, viz. the Oval Pine-Apple, and the Pyramidal, or Sugar-loaf Pine-Apple, the latter of which is superior in flavour, and is distinguishable by having the inner side of the leaves marked with purple stripes. Several of the other sorts are also most excellent, rich-flavoured fruit, equally deserving of culture; and some are cultivated in many of our curious stoves, both for the sake of the variety of their leaves, as well as that of their fruit, all of which attain due size, and ripen freely in our hot-houses, though preference is generally allowed to the two first varieties, and the King-Pine, and Olive-coloured.—The two striped-leaved kinds, i. e. the Gold-striped Pine, and Silver-striped sort, are the most rare of any sort in England, and are esteemed principally for the singularity of their striped leaves.

The four following species, not producing fruit of any consideration, are only cultivated in some curious hot-houses, for the sake of variety.

2. BROMELIA Pinguin.

Pinguin, or Wild Ananas.] Bromelia with many long, sharp-pointed, prickly leaves from the bottom, and in the centre rises an upright thick stalk, half a yard or two feet high, terminated by a cluster of very small fruit, resembling a Pine-Apple.

3. BROMELIA Karatas.

Karatas, or stalkless Wild-Pine.] Bromelia with many very long, narrow leaves from the bottom, strongly armed with sharp, crooked thorns; and in the midst of the leaves rise a cluster of fruits near the ground, each about four inches long, and one broad; somewhat resembling the Pine-Apple.

4. BROMELIA nudicaulis.

Naked-stalked Bromelia.] Bromelia with erect, narrow, aloe-like leaves from the bottom, armed with black spines; and amidst them an erect flower-stem near a yard high, having lower entire leaves, and at top a loose spike of flowers succeeded by a cluster of small ovate fruit.

5. BROMELIA lingulata.

Lingulated Bromelia.] Bromelia with many erect leaves from the root, narrow at their base,

base, widening gradually to the top, and with serrated spinous edges; and in the midst of them the stalk, dividing into branches, sustaining alternate spikes of close-fitting flowers, succeeded by small, oval-pointed fruit.

These four species are propagated by seed; also by suckers like the Ananas, and must always be kept in the stove.

Culture of the first Species, Bromelia Ananas, or Pine-Apple.

The *Bromelia Ananas*, or Pine-Apple, and all its varieties, are herbaceous perennials of the evergreen kind, being perennial not only in root, but also in foliage, so may be said to be herbaceous evergreens; and being raised from bottom suckers, and the crowns at top of the fruit, they, until arrived at a fruiting-state, consist principally of an erect cluster of long leaves standing on the crown of the root, growing two or three feet high: the whole plant increasing in substance and stature about two years, when they commonly produce fruit, each plant one, appearing first in the centre of the leaves, generally in spring, crowning a robust stalk, which, as well as the fruit, grows perfectly erect, gradually advancing in height, and the fruit increasing in magnitude till July, August, or September, then acquires maturity, obtaining in size from about three or four to six or seven inches in length, and three or four diameter, always crowned at top with a beautiful tuft of erect leaves called the crown, serving not only as an ornament to the fruit, but also for propagation; as when detached from the fruit and planted, it strikes root and becomes a proper plant similar to the parent; also, at the same time of the maturity of the fruit, the plants always emit suckers or offsets for the like purpose of propagation, issuing both from between the leaves at bottom, and frequently at the base of the fruit, likewise sometimes small suckers at top, arising at the base of the crown of leaves; and after these productions of ripe fruit, suckers, &c. for propagation to perpetuate the species, the old or parent plants become useless or incapable of future fruit-bearing, and are only sometimes preserved as stools, to produce suckers; so that a succession of young plants is always annually raised for fruiting, which is effected with great facility by the above-mentioned crowns and suckers: these being planted separately in pots plunged in the bark-bed in the hot-house, &c. as hereafter directed, where they soon strike root and grow freely, or may even be struck in a tan or dung hot-bed, made in a pit under a deep frame, or in hot-beds, under a common cu-

cumber or melon-frame, and afterwards removed to the stove to remain to come to perfection; though the plants are by some reared by the benefit of tan or dung hot-beds only, under a deep glass frame, hereafter described; but their culture is generally effected with greater facility and certainty in a hot-house, having the aid of bark-beds and occasional fire-heat.

The appellation, Pine-Apple, given to this plant, is from the resemblance of the figure of the fruit to the cone or fruit of the Pine-tree. See *CONUS* and *PINUS*.

This plant being a native of some of the hottest parts of Africa and South-America, in this country it requires the continual temperature of a hot-house, having the constant aid of bark hot-beds, &c. assisted occasionally in winter by actual fire, or in some kind of glass departments, where we can employ such artificial aids of heat, as sufficiently to imitate the temperature of the native climate of this plant; which is now so well effected in our stoves, that we raise the fruit in almost as high a degree of perfection as it usually attains in the above hot countries where it naturally grows.

It is raised in great abundance in most parts of the British West-Indies, and most other of the hot parts of America, where the plant grows freely at all times in the open ground, and from which country we were formerly supplied with many young plants; but our hot-houses being now plentifully stocked with them, furnish considerably better plants than any procured from thence; for those we receive from that country are often collected from good and bad sorts indifferently, and these frequently almost perished through the length of the voyage, and ill-management; so that the practice now of procuring plants from so great a distance is hardly worth the trouble, unless for the sake of some valuable new variety that shall happen to be discovered.

Holland was the first European country where the culture of this plant was attempted, and the temperature of heat discovered to bring it to a proper fruiting state: and from that country we here in England were supplied with the first plants, and hints for their culture, in which we have so greatly improved, as to equal, if not excel, all other countries of Europe.

The principal season of obtaining this fruit in perfection in England is from June until October, they generally shewing fruit in February or March, which advances gradually to perfection, acquiring maturity at different times;

times; for the fruit of the same time of appearance are often a month or six weeks difference in their times of ripening; but the time of their greatest perfection is August and September, though some plants are sometimes so backward in shewing fruit, that it ripens stragglingly in winter, and even some not until spring; but their flavour is inferior to that ripened at the afore-mentioned times; so that in their culture we ought to promote their shewing fruit early in spring, that they may have the summer to effect their growth, by which they will obtain their due substance, beauty, and deliciousness of flavour.

Of the Hot-house or Stoves, &c. wherein to raise them.

Having before observed, that to cultivate these plants in England, or any part of Europe, they require the constant accommodation of hot-houses; with respect therefore to these departments, requisite particularly for these plants, it is further necessary to remark, that to effect their culture more commodiously, and so as to be well supplied with proper fruiting plants annually, it is proper to be furnished with two orders of such hot-houses or stoves; a smaller one to raise the plants, and a larger one to fruit them; each having a cavity or pit within-side, the whole length, six or eight feet wide, and three deep, wherein to make the bark-bed, i. e. a hot-bed formed of tanner's-bark, in which to plunge the pots containing the plants; for this kind of hot-bed is most necessary in the culture of pines; and each of those departments to be also provided with flues, in which to make occasional fires in winter. See HOT-HOUSE.

The former of these departments, i. e. the smaller stove, is by gardeners sometimes called the pit (see BARK-PIT) or if of a more capacious dimension, the succession-house; and its use is by way of a nursery-stove to the main stove or fruiting-house, it being designed solely for the reception and rearing the young plants, that is, the crowns and suckers before-mentioned, which being planted singly in small pots in autumn, as hereafter directed, are plunged in the bark-bed of this small stove, to remain about a year, or until they attain a proper size and substance for fruiting, without encumbering or taking up the room in the principal fruiting-stove just mentioned; by which means you will be able to fruit many more plants therein, than if the young and old were crowded together in the same department; besides, you can regulate the heat in this nursery stove as the plants shall require, for they must not be much forced in their infant state, lest it drive them unseasonably into fruit; for if this happens when

the plants are less than fifteen or eighteen months old, the fruit, besides coming at an untimely season, will be small and trifling; so that the intention is to rear the plants in this nursery-stove till they are a year or two old, when they will be nearly full-grown, or, at least, most of them will have acquired such size and strength, as to be capable of producing tolerably large fruit next year, and are therefore, at the above state of growth, to be removed in autumn in their pots to the main or fruiting-stove.

And as to the fruiting-stove just mentioned, it is intended principally for fruiting the plants, after being reared from crowns and suckers in the nursery pit or succession-stove a year or two, till they obtain the size or bearing state above mentioned, which being removed in their pots the beginning or middle of October to this main or fruiting-stove, and plunged in the bark-bed thereof, where, by the management hereafter directed, they commonly shew fruit the spring following, and which gradually arrive to perfection the ensuing summer and autumn.

For the proper dimensions of each of these stoves or hot-houses, see HOT-HOUSE, BARK-PIT, &c.

But where large quantities of these plants are cultivated, should, besides the above-mentioned stove departments, have also what is commonly called a bark-pit, formed either by a deep frame of wood, or of brick-work, six feet wide, the length at pleasure, five or six feet deep behind, and four and half in front, having the top glazed (see BARK-PIT), and is designed principally wherein to make a bark or dung hot-bed, for the immediate reception of the crowns and suckers from the parent-plants, as an ease to the succession-stove, by not crowding it too much, which is often at that time entirely filled with large succession-plants for next year's fruiting; but, by the time the crowns, &c. in this pit have struck root and begin to grow, the succession-stove will be thinned of the largest plants, to furnish the fruiting-house, which is generally in October, when the suckers and crowns in their pots may be removed to the succession-stove; though when that department is still crowded with larger plants, these small ones of the same year are often continued in the bark-pit all winter, or longer, if necessary, especially if the walls which form it are of brick, having internal flues arranged in the back wall for fire-heat in the winter (see BARK-PIT); or even, if without flues, or that it is constructed entirely of wood, the temperature of heat may be continued by the aid of strong dung linings against the outides of the

the back of the frame ; for it is also very possible to strike the crowns and suckers, as above noticed, by the aid of dung hot-beds only, either in the above bark-pit, or under common cucumber or melon-frames, covering the top of the dung with tan, wherein to plunge the pots containing the plants.

It is also even practicable to rear and bring these plants to produce ripe fruit by the benefit of dung-heat only, under deep frames, hereafter described ; which, however, though attended with considerably less expense, requires more trouble, and the success never so certain, nor equal to that of proper stoves, aided by bark hot-beds and fires in winter.

Crowns and suckers, however, as already observed, immediately from the parent-plant, may be readily struck and set to growing in tan or dung hot-beds without fire, under common garden-frames and glasses ; and even if the bed is composed of dung, with tan at top, wherein to plunge the pots of plants, they, by the aid of two new beds, with occasional strong dung linings, might be continued there all winter, or, by the additional aid of a more capacious frame, in width and depth adapted to the height of the plants, they might be carried on to a due size for the fruiting-stove. *See Raising them without Fire.*

In many places, however, the whole culture of these plants is performed by the aid of one stove only, not having the convenience either of a succession stove or nursery-pit ; and the plants are raised and fruited all in the same department, though by this practice not above one half of the hot-house can be commodiously occupied at one time with fruiting-plants, the other half must consequently be employed in containing the succession-plants and crowns and suckers, unless you fill the whole pit of the stove with the fruiting-plants, so crowd the pots of young ones in between them, as frequently practised ; however, at any rate, when the young plants are raised in the same stove with those that are fruiting, and that we keep the stove in a due temperature to fruit them in full perfection, there is no certainty of keeping your crowns and suckers, and the succession-plants in general, from running to fruit unseasonably in their infant or half-grown state ; hence the necessity is apparent of having a small stove solely for these young plants, or, at least, a bark-pit, or deep frame, which we above observed.

However, the most commodious and certain culture of this curious plant and fruit, is, by the convenience of two orders of stoves, at least, as we at first advised, having the constant aid of bark hot-beds.

Of the Tanner's-bark for the Bark-bed.

In regard to the tanner's-bark for the bark-bed, we formerly observed, that each of the above stove departments, &c. should have a pit or cavity formed within-side the whole length, wherein to make a hot-bed of tanner's-bark, in which to plunge the pots of plants, and which is commonly called the bark-bed ; this kind of hot-bed is composed entirely of tanner's-bark, which diffusing a peculiar agreeably-moderate, durable, and nourishing heat to these plants, that without it we cannot bring them with certainty to fruit in any tolerable perfection ; for fire-heat alone will not answer the purpose, as, when the plants are not plunged as above, it dries and hardens the extreme fibres, and the plants become stunted, producing small ill-nourished fruit, ripening unseasonably late ; whereas, by plunging the plants in the above hot-bed, the constant moist warmth it imparts to the mould and roots is excellently well adapted to the nourishment and growth of the plants and fruit : and that of the tanner's bark is preferable to any compost of dung hot-beds for this purpose, and being also not only of three times longer duration in its heat, it never, like dung hot-beds, sends up noxious steams ; and as to duration, the same bed, with a little assistance, will support a growing temperature almost a year.

In respect to the time of duration just mentioned of the bark-bed, observe, it is commonly made in autumn, i. e. September or October, that it may be in good condition all winter, and it upholds a fine growing heat about three or four months, which, if then forked up to the bottom, renews its fermentation, and continues two or three months longer ; then if in April you add about one third of new tan, the whole being again forked up to the bottom and mixed together, revives the heat substantially, and continues it in fine order till towards autumn ; and by September and October it will be considerably exhausted, when the whole must be screened, and all the small earthy substance cleared away, levelling the larger in the bottom of the pit, and a large quantity of new is then to be procured from the tanner's, to fill up the pit again to the proper height, three or four inches above the coping, to allow for settling ; at the same time stir up and mix the old and new together, and this work of screening the old, and renewing the pit with fresh bark at the above time in autumn, is to be practised annually to each bark-bed.

For the choice of the bark, and some other particulars relative to this material, see BARK-BED.

Of the proper Soil for the Plants.

In respect to soil proper for the growth of those plants, they prosper freely in any rich, moderately light garden-mould; such as that of the kitchen-ground, where it is of a rich, fat, pliable temperature; and if somewhat of a loamy nature, of mellow texture, it will be an advantage; for nothing heavy, very wet, or stubborn, must be admitted; this mould may be got in readiness in a heap several months before-hand, adding thereto, if necessary, some thoroughly rotten dung; and if the soil is very light, it is proper to add about one half or a third part of fine pliable loam from the surface of a common or other pasture-ground, turning the whole over several times.

Or a compost may be prepared thus:

Procure from a rich pasture-field, or common, some mellow loamy earth, taking the top spit, not digging it out of deep pits, which is harsh and sour; to every load of this add about one third of rich garden earth, and a fourth-part of a load of perfectly rotted dung of an old dung hot-bed; mix these well together, and form the whole in a ridge or long heap in the full air, in a sunny exposure, to lie at least six, but if ten or twelve months, or more, the better, turning the whole several times, that the parts may be properly incorporated, and receive equal benefit of the sun and free air: at each time of turning, break all turfy lumps and clods; and when it is to be used, break it fine with the spade, but not sift or screen any, which would render it too compact.

Of these composts it is proper to provide as much at first as will serve two or three years, since by lying together it will be much improved for the purpose intended, provided it is turned over three or four times annually.

Be careful never to use the earth at any time too wet.

General Method of Propagation.

As to the propagation of this plant, all the varieties, as before noticed, are propagated with great facility by the off-sets or suckers issuing from the lower part of the plant and at the base of the fruit, as well as by the crown or leafy tuft that decorates the top of it; all of which suckers, off-sets and crowns, though devoid of roots when separated from the mother plant, they being planted singly in small pots of light rich compost, plunged in the bark hot-bed in the stove, &c. as hereafter directed, readily emit fibres, and grow freely, and, as already noticed, they after, two, or, at most, three years' growth, produce ripe fruit, equal in size and quality

to that of their respective parent-plants, observing that the same individual plant produces fruit but once; so that after they have fruited and produced a supply of suckers for increase, which is commonly at the time of fruiting, they are good for little afterwards, except as stools to produce a few more suckers; hence it is apparent the necessity there is of raising an annual succession of fresh plants for fruiting, by the above means of suckers and crowns.

Each plant generally yields from two or three to five or six suckers at a time, but rarely more than one crown upon each fruit.

The season for propagating, both by suckers and crowns, is according to the time the plants and fruit produce them, which is principally July, August, and September, according as the fruit ripens, though they will grow at almost any time; observing, however, that both suckers and crowns are always fit to be taken off for propagation when the fruit is ripe, and not sooner; and as to the suckers, it is a sign of perfection when they appear brownish at bottom; they are to be flipped or drawn off carefully with the hand, not cut; the crown at top of the fruit is to be taken off also with a gentle twist; but this latter is not to be done till the fruit is served at table. When they are taken off, both the suckers and crowns should be divested of a few of the lower outward leaves at the bottom, where they are to strike root, then laid or hung up in a dry part of the house or stove four or five days, that the wound or moist part of the base, where they adhered to the plant or fruit, may heal and dry up before they are planted, otherwise they would be apt to rot; but in some of the stools you will often find suckers which assume a brown colour at the bottom, as above hinted, and forming little knobs round the edge at bottom, which are the embryos of future roots; these suckers being ripe, or having had their full growth on the mother plant, do not require to be so much dried as those which appear greener, and may even be planted directly, or, at least, taken off one day and planted the next; but the crowns of those fruit which do not ripen till late in September or October, require to be dried more than those before mentioned, and if suckers of those plants that produce their fruit later do not appear brownish at bottom, it is advisable to suffer them to remain upon the stools longer, or sometimes till March following, for they are very apt to rot at bottom, not only when taken off very succulent, but also when taken off later than October.

We

We have commonly the greatest quantity of crowns and suckers from the beginning of August to the middle of September.

As to the mother-plants or old stools, if you are disposed to have as great an increase of young plants as possible, the stool, after the fruit is gathered, and the suckers taken off, may be trimmed, i. e. cut down all the leaves near the bottom, and then plunge the pots directly in a hot-bed of tan or dung under frame and glasses, and let them be duly watered; they will soon after produce another supply of suckers, though those of the first production are rather preferable.

And, as sometimes particular plants produce ripe fruit and no suckers from the bottom at that time, in this case, which, as soon as the fruit is cut for the table, may trim down all the leaves to stools, as above directed, and plunge them in a hot-bed of brisk heat; it will dispose them soon to send forth several suckers.

Method of planting, and their Management in the Nursery-stove, &c.

To proceed to the manner of planting the crowns and suckers, and general culture the first year, to prepare them for the fruiting-stove, observe as follows.

Having the bark-pit in the nursery-stove or frame, &c. filled with tanner's bark (see BARK-BEDS), and of a proper brisk temperature of heat, for the reception of the crowns and suckers, as they are collected from the mother-plants, at the times and manner above mentioned, and having the proper compost in which to plant them, pots, and every other requisite in readiness as they shall be wanted, these young plants, according as they are procured and prepared, as before advised, are to be planted singly in small pots of the size called forty-eights (see POTS), which, at the time of planting, are to be filled with the aforesaid compost or mould, taking previous care to put a shell or piece of tile over the hole at the bottom of each pot, to keep the mould hollow, that the water given the plants may, when settled to the bottom, pass off freely; the pots being thus filled, one plant, i. e. crown or sucker, is to be planted in each pot; in doing of which, be cautious not to plant them too deep, for the earth to get between their leaves; neither should they be planted too shallow, for so they would be liable to be displaced by watering, or doing any other necessary culture; observing to press the earth close about each plant.

According as the plants are thus potted, they are to be directly plunged in the bark-bed of your succession-stove or nursery-frame, &c. above described, observing that the bed be previously arrived to a due degree of

moderate heat; in which the plants are to be arranged according to their different sizes, placing the largest next the back-part, and the smaller in front, and the others in proportion; and being thus regularly disposed, it will add to the beauty of them, and every single plant will more easily receive an equal benefit of the sun; being careful to plunge each pot up to the rim in the bark.

As soon as they are plunged give them a gentle watering; and, if the weather is sunny and hot, shade them moderately in the heat of the day, till they are firmly rooted.

Having thus planted and plunged the plants in the bark-bed, &c. they will in a week or two strike root and begin to grow, when air must be pretty freely admitted; for at this period it is advisable to promote but a moderate temperature of heat, that is, not to increase it considerably by keeping the stove or frame too close while the heat of the bark-bed is strong, which would not only draw up a vehement heat in the bed at first, and force the young plants too much in growth, but, by being too closely confined, would draw them up weak, with long, feeble, whitish, sickly leaves: fresh air must therefore, at this time, be daily admitted, at least at all opportunities, when the days are warm and calm, by sliding or tilting the glasses a little open, which must always be proportioned in a judicious manner, for there are no precise rules to be given for it; but by making use of your own observation and experience, added to these directions, you will soon attain a due knowledge in this point. From about nine or ten, to four or five o'clock, is the proper time of day for the admission of air.

Watering also is requisite, though very moderately, about once a week, especially until the plants begin to grow, when they may be watered more freely, and in fine warm weather should be sprinkled all over their leaves.

As the winter advances, be careful that the bark-bed, wherein these young plants are now plunged, uphold a constant temperature of heat, which is readily promoted by forking up the bark once or twice during this season, according as the heat shall decline; likewise keep the internal air of due temperature, by the aid of occasional moderate fires on nights, provided the department is furnished with flues, or, in default thereof, by linings of hot dung against the outsides: fresh air must also be admitted from without, judiciously, at all favourable opportunities, in sunny calm days, by sliding or tilting some of the glasses or sashes a little open; and moderate

derate watering is necessary about once a week, especially if the plants are in a stove or pit where fires are made; in other cases it must be applied seldom, and very sparingly.

In respect to the bark-bed, it generally supports a good temperament of heat till January or February, when, if the heat is found much abated, take up all the pots, and with a fork stir up the bark, as before observed, quite to the bottom, plunging the pots again directly, and this will promote a fresh fermentation, and greatly revive the heat, so as to maintain a due temperature the remainder of the winter.

And as to the fire-heat above noticed, for warming the internal air, observe, that, if the plants are in the nursery-stove or succession-house, or any other department, having flues for making fires, it is proper to begin to make moderate ones on nights, the beginning or towards the middle of November, or a little sooner or later, as the frost or other very cold or dark foggy weather shall render it necessary, being cautious never to make the fires too strong for these young plants, lest, by occasioning them to shoot too fast, it force them into trifling fruit the same winter, or ensuing spring or summer, which would be a great disappointment in respect to having proper-sized plants at the due time for the fruiting-stove; for if once these young plants draw up with long leaves, appearing white at heart, it is generally the sign of a too forward growth, and the consequence of their untimely fruiting; therefore never be too eager in forwarding their growth at this season.

In severe weather the glasses of the stove should be defended on nights with the proper covers, either of thick canvas, oil-cloths, or tarpaulin, let down by a roll and pulleys, or by large garden mats.

Where these young plants are wintered in any detached bark-pit, or any kind of frame devoid of flues for having fires, I advise, in this case, when the winter advances, that the pit or deep frame, wherein the bark-bed is made, be lined around on the outside with hot dung, as practised to cucumber or melon-beds, quite from the bottom to the height of the internal bark-bed: on top of the lining lay old hay, fern, or other similar dry litter, continuing either of which materials from the top of the lining to that of the frame all around, which will preserve the heat of the linings the longer, and prevent the frost from penetrating the sides of the frame, observing, that when the lining declines its heat, remove the litter, and add a sufficient quantity of fresh dung on the top of the former to the height of

the frame; or, if the heat is considerably abated, stir up the whole with a fork, old and new together, to the above height, which will renew the heat quite from the bottom; and this stirring or turning over the linings, with the occasional addition of fresh dung, in lieu of such that becomes exhausted, is to be repeated as often as it shall appear necessary during the winter or continuance of cold weather, which will not only communicate its heat to the bark-bed, but assist greatly in warming the internal air of the frame, observing also to cover the glasses every night and severe weather, and give but very little water to the plants in this department during winter.

Having in either of the above departments conducted the plants safe through the winter, it now remains to give directions concerning their spring culture.

As to their spring culture, the necessary care of preserving heat in the bed, and in the internal air, together with the admission of fresh air from without, every fine day, and occasional waterings, as already directed, is still to be observed with strict attention; for it is of importance to remark, that from the month of March until September, is the principal growing season of these plants; so must begin to encourage it as much as possible, though by no means force them; but that when there is a good heat in the bed, indulge them freely with fresh air, and refreshments of water, by the rules already laid down, and hereafter directed.

At this season the plants, for one thing, require their first shifting into pots a size larger, and the bark-bed to be stirred up again, and refreshed with about one-third of new tan.

This first shifting may be performed any time in April, though about the middle of that month is a very good time for that work, and the proper sized pots are those called thirty-twos (see POTS). The proper time being arrived, and the pots and proper quantity of compost mould brought ready, proceed to take up the plants out of the bark-bed, and turn each singly out of its present pot, with the ball of earth entire around its roots, unless any appear very unhealthy, or any ways defective, when it is eligible to shake the earth from the roots, and trim off all the long fibres and any parts that appear not alive; also decayed leaves on the plants in general must be stripped off, not cut; then, having put a piece of tile or oyster-shell over the holes at bottom of each pot, put in a little fresh compost, and on this place your plant, and fill up around the ball or root with more

new mould almost to the brim of the pot, pressing the earth moderately firm about the body of the plant; and when the whole is thus shifted, directly prepare to plunge them again in the same bed; previous to which, observe, as above, to add about one third, at least, of new tan to the old, or as much as will sufficiently raise the bed as much as it has sunk since autumn, previously clearing away any very crumbly or exhausted earthy part at top or outsides; then, having filled up the pit to the usual height with the new tan-bark, immediately proceed to work the whole, old and new, up together, with a fork (see BARK-BED), and directly plunge the plants as before, the tallest at back, continuing the lowest gradually to the front; and as soon as the whole is thus plunged, give a moderate watering all over the leaves and mould of the pots, to cleanse the plants, and settle the new earth close about their roots.

The plants having thus had their first shifting, and the bark-bed its spring renewal by a little new tan and fresh forking up, the principal future culture during summer is the necessary supply of fresh air and water; for the bark-bed will now maintain a proper heat till towards autumn, or time the plants require shifting again.

As the summer comes on, the plants must be indulged more freely with air and water; air must be admitted every day, whensoever the weather permits, by opening some of the lights, more or less, which should be done the most freely when the days are sunny and the wind quiet; and in July and August, if the weather is very hot, the plants should be permitted to enjoy a very large share of air, even so much as to be sometimes almost fully exposed in the middle of such days; for as they will now grow freely, if they are too closely confined they will draw up long and slender, and become feeble and less able to produce fruit in full perfection of size and flavour; and likewise, by too close confinement in summer, they will be in danger of going into fruit early in winter. Water during this season in warm sunny weather is necessary, in moderate quantities, about twice a week, applying it in a morning until June; and during the hot months of June, July, and August, an evening is the most eligible time, sprinkling the water occasionally all over their leaves; which works of admitting fresh air, and giving water, are the principal culture necessary to these plants in summer, until the time of their second shifting into larger pots in August.

Observe, however, if the bark-bed is much

crowded with plants, and that by the beginning of July they have advanced considerably in growth, it would be of much advantage to remove some of the smallest plants in their pots into a bark-bed, under any common frame, till October; so re-plunge the larger ones at a more eligible distance in their present department, which is the most necessary culture to encourage them to bottom well.

In regard to their second shifting, the plants in general will require it in August, at which time a quantity of the strongest plants are to be shifted into proper sized pots, wherein they are finally to remain to produce their fruit.

This second shifting is to be performed about the beginning or middle of August; the pots proper for their reception now are called twenty-fours, but not larger than sixteens for the stoutest plants: in the execution of this work observe to turn the plants out of their present pots, one at a time, with the ball of earth entire about the roots, and may carefully trim off a little of the outside mould as also some of the extreme fibres of the roots on the outside of the ball, still preserving the ball of earth about them; then having tiled or shelled the holes of the new pots, and put some fresh earth at bottom, proceed in the planting one plant in each pot, placing it upright, and fill up the pot around the ball with more compost almost to the top, and when they are all shifted, stir up the bark-bed to enliven the heat: or also, if necessary, add a little fresh tan; and instantly plunge the pots again, and give a moderate watering all over the plants: here they may remain six weeks or two months, or longer; for if the bark-bed at this time of shifting is well forked up to the bottom, it will uphold a heat proper to support the plants in a growing state till October, when most of them will have obtained a large size, and the fruiting-stove is to be got ready for the reception of the largest that appear capable of fruiting in perfection the ensuing year: in the mean time be careful, after this second shifting, to continue the admission of a due portion of fresh air daily, to strengthen their growth, to dispose them to produce handsome fruit at the due time; supplying them also with gentle refreshments of water, once or twice a week, or according to the temperature of the season, and as it may seem requisite by the earth in the pots appearing less or more dry, so giving water in proportion, always moderately.

Removing them to the Fruiting-stove, and Culture there.

Towards the end of September, the above plants

plants in the nursery-stove or succession department will be grown to a considerable size, when the fruiting-stove, &c. must be got ready, and its bark-pit filled with entire fresh tan, for the reception of the largest plants; and such as have not yet acquired due strength for fruiting in perfection next year, may be permitted to have another year's growth in the succession-stove.

If the fruiting-stove is now occupied with plants in fruit, the succession-plants cannot be moved thither till the fruit is mostly all cut, which for the general part is pretty well cleared by October or beginning of November, at which time a sufficient quantity of fresh bark or tan must be procured from the tanner's to fill the bark-pit of this stove, for the bark-bed must be always renewed annually almost entirely with fresh tan at this season, at same time previously screening all the old tan to separate the larger from the small exhausted parts, and all the small earthy stuff that passes through the screen taken away, and levelling the other along the bottom, provide as much new tan as, with this, will fill up the pit to the proper height.

As to the choice of the new tan-bark, it should be fresh, i. e. having been but shortly thrown out of the tan-vats, and rather large than small, for the latter soon becomes earthy, and loses its fermentation: when it is brought from the tanner's, it is frequently wet and unfit for immediate use; in which case it would be necessary, previously to applying it in the pit, to prepare it to a proper state, either by forking it up in an heap, to drain off the too copious moisture, or rather spread it thinly on some clean level ground for a day or two; then, if thought necessary, may cast it together in a heap to ferment a little, to acquire some moderate degree of advancing heat, or if apparently of a good lively state, carry it immediately into its destined pit in the stove or hot-house, laying it upon the remaining old tan; but, observing that as you proceed in applying the new tan in the pit, beginning at one end, fork up the old and new together, raising the whole three or four inches higher than the top of the pit wall, to allow for settling; then, the bed thus finished, permit it to remain a week or ten days, to acquire a due temperature for the reception of the plants from the succession-stove; for they must not be plunged in it before it is capable of imparting a proper warmth to the mould in the pots.

Having thus prepared the pit of this stove, as above, with good fresh bark, and it has obtained the due degree of heat, then im-

mediately bring your largest plants from the succession stove in their pots, and plunge them with the same regularity I before advised, and allow them room, that they may bottom well, for this is of importance in respect to their producing large fruit: the plants being plunged, it is proper the next day, or as soon as the bed has communicated a proper warmth to the earth in the pots, to give them a moderate watering, both to the pots and all over the leaves, which will be a considerable refreshment to the plants; or, in the first night or two, if cold weather, may make a moderate fire to heat the flues, which will assist in drawing the heat in the new bark-bed.

They being now placed in the fruiting-stove, are called fruiting-plants.

Their culture in this department, i. e. the fruiting-stove, differs little from that in their former repository.

All winter the internal air of the stove must be sufficiently supported by the aid of fires on nights, and severe frosty weather. As to the heat of the bark-bed, it will support a due temperature till January or February, when forking it over will revive it for two months longer. Fresh air during this season must still be admitted with discretion at favourable occasions in sunny mild days, and moderate waterings will be needful about once a week.

With respect to the time to begin to make the fires, is some time in November, either sooner or later in that month, according as the cold advances, for we must be very careful to observe this as soon as frosts, or very foggy or cold wet weather renders it necessary; but, unless sharp cold or frosts happen, gentle fires only on nights should be made until December or the beginning of January, when they should be gradually increased more brisk, in order to prepare the plants for shewing their fruit in February or beginning of March, being always careful to regulate your winter's heat by the thermometer (see THERMOMETER); observing the fires are to be made principally on nights, except in frosty or very cold or foggy damp weather, then it is proper to continue them also moderately in a morning.

Generally light the night fires about four or five o'clock in the evening, in the winter, keeping up a good moderate degree of heat till nine or ten; when, if necessary, give the last augmentation of fuel, sufficient to support a proper internal heat during the night.

When very rigorous frosts prevail, the fires must also be continued in the morning and all day.

Likewise in very cold foggy damps, or sharp cutting weather, should also make moderate fires in a morning, or occasionally continued in the day time.

But in quite mild open weather, should make the fires principally of nights, or continued very moderately in a cold morning occasionally.

In very severe weather it is also eligible to cover the glasses on nights with such covers as the stove is furnished, either by large thick canvas cloths or tarpaulins on rolls, to let down and up by pullies; or with large mats; but the first-mentioned is the most ready covering for the top glasses (see HOT-HOUSE); though this is sometimes attended with inconvenience by tempestuous winds blowing it up and down with violence against the glasses, and breaks them considerably, also sometimes apt to be frozen that it cannot be drawn up without damaging the glass-work; therefore many use no other covering for their stoves, where fires can be made, than nailing strong mats at top in very severe weather; also occasionally against the front and end glasses.

During this season give air discretionally in fine, mild, sunny days, from ten or eleven till about two or three o'clock, as favourable opportunities shall then offer.

Give also moderate waterings about once a week, and not much over their leaves at this time of year, using the tin pipe hereafter mentioned.

Towards spring, when the plants begin to shew fruit, be still careful to promote a due degree of heat in the bark-bed, and continue the fires regularly on nights, and occasionally in the morning, or sometimes all day, according to the above intimations; and give air and necessary waterings. If, in January or February, as above hinted, the bark-bed decreases much in its heat, fork it up, as directed for the succession-plants, which will renew the fermentation, and continue it in fine order until April, when a little new tan must be added, and the whole again well stirred up together to the bottom.

In the beginning of April, therefore, prepare to add some new tan, and stir up the bark-bed again, to promote such a durable heat as will carry the plants through the summer, and till the maturity of the fruit now advancing in growth: to do this the more effectually, provide about one third of the pit full, or a little more or less, of new tan, prepared, as before, in making the bed; and after taking up all the pots of plants, throw this in upon the old tan, filling up the pit to

the full height, then fork the whole up to the bottom, mixing the old and new well together; this done, level the top, and directly re-plunge the plants, and the effect of this operation will soon appear in the growth of the fruit; for after the fruit begins to advance, it is good culture to promote a good heat in the bark-bed, as well as sufficiently to preserve a proper temperature of fire-heat in the internal air, according to the degrees marked on the thermometer, that you may more freely apply the necessary aids of fresh air and water; and that by proportioning the heat, air, and water, depends the whole success of having large and well-flavoured Pine-Apples.

One caution in respect to watering is, that after the fruit begins to appear, I advise not to water too freely all over the plants, but more especially when they are in bloom, lest you wash off the farina of the antheræ, before it has sufficiently performed its fecundating function, and thereby prevent some of the knobs or tubercles of the fruit from swelling, which would render the fruit unfitly; therefore, in watering at this period of their growth, it is proper to use the tin pipe hereafter mentioned, which is also very convenient for watering at all other times, and more especially in winter, when the plants should never be so much wetted as to occasion water to stand in their hearts.

As the summer and warm weather advances, gradually decrease the strength and use of fire heat, and by degrees use it only occasionally, so as to leave it wholly off in May.

Continue during summer to admit fresh air daily into the stove, by opening some of the front or top lights more or less, according to the power of the sun's heat, observing, that from about eight or nine in the morning, till four or five in the evening, is the proper time for doing this: also continue to give water freely all summer, about twice a week, at least, in hot weather, performing it either in a morning or an evening, which, after the blossom of the fruit is past, and it advances in magnitude, may be given in occasional refreshments all over their leaves, as this will promote a lively appearance in the plants, and encourage the free growth of the advancing fruit; for the heat of the bark-bed being promoted by the means advised to be practised in April, if you are careful during the hot weather to indulge the plants freely with fresh air and refreshments of water, agreeable to the preceding rules, the fruit will increase freely in bulk, and advance fast to perfection, so as those which appeared early in spring will probably arrive to maturity in June or July.

They,

They, however, in respect to the times of ripening, generally come dropping in from June or July to October or November, but are commonly in greatest perfection in August and September.

The first sign of perfection in most sorts is, their assuming a singularly beautiful golden yellow, though some discover different tints peculiar to them; but the most certain sign of full growth and ripeness in this fruit is its delightful fragrance: observe therefore these tokens of perfection, and let the fruit be gathered before it becomes soft; for it would then be greatly diminished in its perfume and delicate poignancy of flavour.

The manner of gathering this fruit is, to cut it from the plant with several inches of the stalk, preserving also its crown of leaves at top.

To have it eat in the highest perfection of flavour, it should be cut in a morning before nine o'clock, and laid in a cool dry place till dinner-time, or till wanted; but its juice is always more poignant and rich when eaten the same or next day, though they will keep a week or longer, if required upon any particular occasion.

It is always served to table with its crown of leaves on, and when the fruit is to be eaten, the crown is twisted off and reserved for planting, to become a new plant, which, in its turn, produces a fresh fruit, as well as suckers for future propagation.

If too many of these fruits are like to arrive to maturity together, their ripening may be retarded by removing some of them to one end of the stove by themselves, and so shade the glasses with mats in sunny days.

As to the old plants, after the fruit is gathered, they bear no more, so are only fit for stools to produce suckers, if thought necessary to retain them for that purpose: having their leaves trimmed down close, and plunged in the bark-bed, or any other brisk hot-bed, as we have before directed.

Necessary Observations.

In respect to the tin pipe before recommended to be used occasionally in watering these plants, it is extremely useful and convenient, for the more ready conducting the water, in the quantity intended, to any particular plant in any part of the bark-bed: its dimensions may be six feet long, an inch and half diameter at the upper end, the other about half an inch, and should generally be formed of two or three separate detachable joints to lengthen or shorten at pleasure; at the largest end should be a kind of funnel, either fixed, or to take off and on occasion-

ally, to receive the water from a watering-pot. By the assistance of such a pipe, the water is readily conveyed to all the plants separately in any quantity, without pouring any into the hearts of them when not intended, or without wetting the bark-bed more than what is necessarily applied to moisten the earth in the pots, &c. This pipe should be particularly used in winter; also occasionally in spring during the bloom of the fruit.

Soft water should always be used for watering these plants, either that of a river, pond, or rain-water, being careful in applying this article never to give it in too great quantities, to wet the mould considerably, especially in winter.

In winter it would be proper to have a cistern, or some other conveniency placed in the stove to contain water, that the chill may be a little taken off previous to watering the plants therewith.

With regard to the fuel for making the fires in the stoves, several sorts are used.

The best fuel for this use is coal, or coal cinders, which make the most ardent, regular, and durable fires of any other material whatever, and therefore, where it can be obtained at a moderate expense, I should particularly recommend it for this purpose: but, in default of coal, wood is next to be preferred, and the larger the principal part is, the better for the duration of the fires. Next to wood is ground peat and turf, but these are soon exhausted, unless the fire-place is purposely constructed (see HOT-HOUSE). There is a sort of fuel by some used, to be had at the tan-yards, made of old tan, &c. into square lumps, which is also called peat; but all these are inferior to coal, though, where this article is scarce, one or other of these must suffice.

It is to be observed, the fires in each department are to be made chiefly from November until April or beginning of May, and should be made every evening about four, five, or six o'clock, which should be attended twice or thrice till bed-time, so as to warm the flues sufficiently to support a due temperature in the air of the stove till morning, when, in very cold or frosty, and very wet or foggy damp weather, a moderate fire should also be made; but in mild dry weather none is necessary at that time of the day.

To regulate you in regard to the strength of the fires, and proper times to make them, it is proper to have a good thermometer always hung up in the middle of the stove, having the proper degree of heat marked *Ammanas*, never permitting it to be more than five or six degrees above, nor less than that

below

below the mark. See THERMOMETER and HOT-HOUSE.

Raising these Plants without Stoves and Fire-heat.

We having occasionally observed, that it was possible to raise and fruit this favourite plant without the aid of stoves or fire-heat, by the heat of hot-beds only, under proper frames: the hot-beds for this purpose are either of tanner's-bark, assisted by occasional dung linings, or may be composed of dung, having a foot of tan or saw-dust at top, in which to plunge the pots, and assisted also by proper linings of dung.

This method, however, though apparently considerably the least expensive, is attended with much more trouble and uncertainty than the stove culture already treated on, having the constant aid of bark hot-beds, and fire-heat in winter.

However, for the advantage of those who cannot easily obtain a plenty of tanner's-bark, and who have no mind to go to the expense of erecting stoves, and burning fire six months in the year, and are disposed to make trial of raising Pines by the above methods, we shall proceed to give some hints for the manner of effecting it, though we do not recommend it as a generally successful practice.

I before noticed in the stove culture, that the crowns and suckers immediately from the mother-plant may be readily struck, i. e. rooted, and set to growing in a tan or dung hot-bed, under a common cucumber or melon-frame, or one or more of similar construction and larger dimensions in width and depth, to give more room both ways for the plants to grow.—The dung-bed having ten or twelve inches depth of tan at top, or, in default thereof, saw-dust (but tan is best), in which to plunge the pots containing the plants; and by shifting them into one or two new such substantial hot-beds, with the addition of occasional linings of the same material, the plants may be continued there all winter, or even until the following autumn, provided the frames were of due depth for the plants to grow.

But for this purpose it is proper to be provided with two different sized wood frames, furnished with suitable glass lights, particularly for this method of culture, one by way of a nursery-frame, to strike and rear the plants, and another of a greater depth, for fruiting them, as advised for the stoves.

The first of these frames being intended as a nursery-frame for rearing the crowns and suckers, its dimensions may be ten or twelve feet long, four to six wide, three and a half deep at

back, and two and half in front, with three sliding lights at top, and if half the depth of the front was glazed it would be an advantage; which frame, at the proper time for planting the crowns and suckers, i. e. August and September, is placed upon a bark-bed, or substantial dung hot-bed covered with tan, to plunge the pots in, or, for want of that, saw-dust, but the former is greatly preferable; observing, if you use dung-beds, three or four different new ones, with occasional linings, as hereafter described, will be required to support the growth of the above young plants a year, or till fit for the fruiting-frame, being careful to supply them at due times with fresh air and water, as directed in the stove-culture; though, in this place, as having no fires to dry the damps, they must be very sparingly watered in winter.

The fruiting-frame being intended to fruit the plants, must be deeper than the former, and the whole front and ends, as well as the top, glazed, and may be made to place on the top of a raised pit of the same width and length, and three feet and half deep, formed either by a wall of brick or strong inch plank-ing, in which to make the hot-bed; which pit is more particularly eligible, if you intend to have a bark hot-bed: but as to the dimensions of the frame, it may be twelve feet long, four to six in width, four and half deep in the back, and two and a half to three depth in front, having three sliding sashes in the front, and one at each end, and the whole covered at top with three glass lights to shove up and down; the glazing at top done imbricatum, as directed for the hot-house (see HOT-HOUSE); having also large mats, painted canvas, old sail-cloth, or other covering, to use on nights, to defend the glasses; or also when extremely cold weather, or severe frost, should likewise add a thick covering of dry straw litter. As to the pit, it may be sunk eighteen inches, if dry ground, allowing width and length enough to build a nine-inch brick wall on every side, to form the cavity of the pit of proper dimensions to receive the frame at top, which wall is to be three feet six inches high from the bottom; or, if the back part was of inch deal, would be more convenient to admit the benefit of lining, to renew the heat; or, instead of brick, a pit formed entirely of post and plank-ing; or a moveable wood one would answer the same purpose: upon this pit, or frame, the glass frame of the aforesaid dimensions is to be placed, and the hot-bed is previously to be made in the pit to its full depth. To render it still more convenient, one such frame might be made to serve two pits, making it to slide

slide from one to the other, having a partition between; and when one bed has declined its heat, make a fresh one in the spare pit, so slide the frame over it, and move the plants therein; the utility of this will be very obvious in practice, especially if the hot-bed is composed of dung, which will require renewing three or four times in the course of the year.

This is the general construction of the fruiting-frame.

In the pit of this frame, a hot-bed of tan, or of dung covered with tan, &c. before hinted, is to be made the latter end of September, for the reception of the plants from the nursery-frame, observing, if the bed is of dung, make it substantial enough for the top surface to be within eight or ten inches of the top of the pit when fully settled, upon this lay the tan or saw-dust above mentioned, and in which plunge the plants in the same order as in the hot-house, giving fresh air and water, agreeable to the directions in the stove-culture, but being still careful to water with great moderation in these frames during winter, and cover the glasses every night in that season and in the spring as long as the cold season continues; either with large thick garden mats or dry long litter, or both occasionally, especially in severe weather, in which should lay the covering very thick to keep out the frost; and when this is rigorously severe, should continue the covering occasionally in the day.

If the hot-bed of this frame is of tanner's-bark, it, by the aid of dung linings at back of the pit, will support a due temperature till February; then stirring it up, as directed in the stoves, renews the heat till April; and then, by adding a little new tan, and another forking up, and occasional linings, it will support a sufficient heat to bring the fruit to maturity; but if the bed is of dung covered with tan, &c. two new beds, with occasional linings, will be requisite to carry the plants through the winter; that is, one bed when the plants are first placed in the frame in September, and another new one in December or beginning of January; and at least one more to bring the fruit to perfection: hence the utility of having two pits, as you can then conveniently make a new bed in the spare pit in due time, to acquire a proper temperature to be ready to receive the plants in their pots immediately from the declined hot-bed, at the same time shoving the frame from thence over the new one. Observe, in the mean time, during winter, that as soon as you perceive the heat of the bed, either that of tan or dung, begins to abate, you begin to

line the back part of the pit and frame on the outside with hot-dung, both to enliven the heat of the bed, and assist in warming the internal air of the frame: this lining should be laid two feet wide, at least, at bottom, and a little sloping at top, that the wet may pass off freely; neither should it be raised to the full height at first, but a little at a time, as the frost or severe weather increases, till at last it become as high as the whole back-part of the pit and frame together, continuing it also, as the cold advances, round the ends and front of the pit, at each time laying hay, fern, or other dry litter upon the lining, which preserves the heat the longer, and prevents the frost from penetrating the frame; and by thus gradually lining the beds, as the severity of the weather shall demand, it will maintain the due temperature of heat much longer, and more regular than if the whole quantity was to be added at once; observing, when the heat of these linings is much decreased, it must be renewed by the addition of some fresh dung, and the whole forked over to the bottom, which is to be repeated as you shall see occasion.

By observing the above directions in the management of the hot-bed, and giving fresh air at all due opportunities consistent with the rules laid down in the stove culture, and moderate waterings at times in fine sunny weather, the plants will shew fruit in February or March, which will ripen at the usual time in as good perfection as can be expected by this method of culture.

BROOMS, for the use of gardens.

In pleasure-grounds, Brooms are almost daily wanted, especially in summer, and the best sorts for this use are those of Birch, made of the finest brush-wood, that will not soon become stubbed; nor should they be made very large and clumsy, which would tear up and deface the grass and gravel.

Heath Brooms are sometimes used; but these are not near so good as Birch ones for gardens.

In default of Birch, Beech-Brooms are also sometimes used, which being made flat, spreading, and light, they will answer tolerably for sweeping the mowings of short grass, and fallen leaves off grass-ground; but are not so fit for use on fine gravel, except lightly to whisk it from fallen leaves.

BROWALLIA, (*Browallia*.)

A genus of tender stove Annuals, producing beautiful, monopetalous, wheel-shaped flowers.

Class and order, *Didynamia Angiosperma*.

Characters.] **CALYX**, a dentated monophyllous cup. **COROLLA**, funnel-shaped, monopetalous,

petalous, with a plain equal border cut in five laciniae. STAMINA, two long and two short filaments placed in the throat of the corolla, and simple antheræ. PISTILLUM, an ovate germen, slender style, the length of the tube, crowned with a broad, four-lobed stigma. PERICARPIUM, an oval blunt capsule of one cell, containing many small seeds.

The species are,

1. *BROWALLIA demissa*.

Spreading Browallia.] With lanceolate-linear leaves; and peduncles one-flowered: bright blue purple.

2. *BROWALLIA elata*.

Upright Browallia.] With spear-shaped leaves; long, erect racemi; peduncles one and many-flowered; and the tube of the corolla long and slender: deep-blue.

Both species are very ornamental annuals, particularly the second species; the seeds may be sown on a hot-bed, and when the plants are about two or three inches high, may be planted in single pots of rich earth and plunged in the stove, giving occasional waterings; where they will flower a good part of the summer, and ripen their seeds.

BRUNIA.

This genus comprehends several elegant, shrubby, green-house plants.

Class and order, *Pentandria Monogynia*.

Characters.] The flowers are aggregate. CALYX, the common cup multiflorous roundish and imbricated: the proper cup consists of five oblong villous leaves. COROLLA, five petals, narrow at their claws, with a spreading limb. STAMINA, five capillary filaments inserted in the claws of the petals. PISTILLUM, a small germen, style simple, and stigma bifid: there is no pericarpium; the seeds are solitary and bilocular, produced on the germen receptacle.

The species are,

1. *BRUNIA nodiflora*.

Knot-flowering, imbricated Brunia.] With three-cornered, imbricated, acute-pointed leaves.

2. *BRUNIA lanuginosa*.

Woolly, heath-leaved Brunia.] With linear leaves opening at the top, and the branches surrounded with a woolly down.

3. *BRUNIA abrotanoides*.

Thyme-leaved Brunia.] With linear-lanceolate, spreading leaves, hard and triquetrous at their top, and the flowers conglobate.

4. *BRUNIA radiata*.

Radiated Brunia.] With linear three-cornered leaves, the cup radiant, and the folioles coloured within-side.

All these species are durable in stem, root,

and branches, but being natives of the Cape of Good Hope are a little tender, and require a green-house for their protection, and flower annually.

Their propagation is by cuttings or slips: in the spring a quantity of young cuttings or slips of the younger shoots may be taken off and planted in pots of rich earth, and plunged in the hot-bed or stove, frequently giving them water; they will strike root, and may afterwards be planted in separate pots, and treated as other green-house plants.

BRUNSFELSIA.

There is but one species, a shrubby exotic of the stove, garnished with simple leaves and funnel-shaped flowers.

Class and order, *Pentandria Monogynia*.

Characters.] CALYX is monophyllous, bell-shaped, five-parted, and permanent. COROLLA, a funnel-shaped petal, the tube long, but spreading and five-parted at top. STAMINA, five filaments inserted into the corolla, and oblong antheræ. PISTILLUM, a roundish germen, slender style, and thick stigma. PERICARPIUM, a globular berry of one cell, having numerous seeds.

The species is,

BRUNSFELSIA Americana.

American Brunfelsia.] Brunfelsia with a woody, branching, rough stem six or eight feet high, garnished with oblong, entire leaves on foot-stalks, and large whitish flowers by threes or fours at the ends of the branches, succeeded by round, saffron-coloured, soft fruit.

This plant may be raised here from seeds in the spring, sown in pots, and plunged in a bark-bed; and may also be propagated by cuttings in the same season planted in pots, plunging them also in a bark-bed or other hot-bed under glasses; and the plants must always remain in the stove.

BRYONIA, the White Briony, or Wild White Vine.

The plants are herbaceous climbers, consisting of annuals and perennials; of the latter are about two species that merit notice by way of variety; one a hardy plant of English growth, the other an exotic that requires shelter in winter.

Class and order, *Monœcia Syngenesia*.

Characters.] CALYX, male and female flowers apart on the same plant, having a monophyllous bell-shaped cup, five-parted at top. COROLLA is bell-shaped, five-parted, and adheres to the calyx. STAMINA, the male flowers have three short filaments, two of which have double antheræ, the other one. PISTILLUM, in the female flowers a germen under the corolla, a trifid patent style, and spreading

spreading emarginated stigma. PERICARPIUM, a smooth oval berry, having oval seeds adhering to the skin.

The species are,

1. *BRYONIA alba*.

Common White Briony.] Briony with a very large, thick, fleshy, white root, sending up annually very long climbing stalks and branches, garnished with large, palmated, rough, callous leaves, and numerous clusters of white flowers in May and June, succeeded by bright red berries.—With black berries.

2. *BRYONIA africana*.

African Tuberous-rooted Briony.] Briony with a large tuberous root, sending up annually several slender rambling stalks, having palmated, five-parted, smooth leaves, their lobes cut and pinnatifid, and clusters of greenish flowers, sometimes succeeded by berries having ripe seed.

Both species have perennial roots, but the stalks of the first die annually in autumn.

The *Bryonia alba* is a wild plant of England, inhabiting dry banks under hedges, where the roots acquire a monstrous size, sending up strong climbing branches, running many feet long, and attach themselves to the bushes, or the first thing they encounter in their progress, and make a singular appearance, but it is seldom admitted in gardens, though a plant or two for variety merits a place in large grounds as climbers.

The root of this species is also in great request for medical uses.

Its propagation is easily effected by sowing the berries in spring in a dry light soil where the plants are to remain; and when they come up, thin them to a considerable distance.

The African sort must be kept in pots to be moved under shelter of a frame or greenhouse in winter.

It is raised by seeds in a hot-bed in spring.

BRYONIA NIGRA. See *TAMUS*.

BUBON, Macedonian Parsley.

This genus comprises herbaceous and shrubby plants; the former have little merit, but of the latter are two species proper to be admitted in the green-house collection.

Class and order, *Pentandria Digynia*.

Characters.] CALYX, umbelliferous flowers, having a five-leaved involucre; the general umbel composed of about ten smaller; each smaller one of fifteen or twenty rays, and a small permanent calyx to each floret. COROLLA, each floret of the umbel consists of five spear-shaped inflexed petals. STAMINA, five filaments and simple antheræ. PISTILLUM, an oval germen below the corolla, two reflexed styles, and blunt stigmas. PERI-

CARPIUM, none; an oval two-parted fruit, having two seeds.

The species of note are,

1. *BUBON macedonicum*.

Macedonian Herbaceous Bubon.] Bubon with many compound leaves from the root, on longish foot-stalks; each leaf composed of many oval rhomb-shaped indented lobes, and in the midst a branching flower-stalk about fifteen inches high, having all the branches terminated by white umbels in July, and ripe seed in autumn.

2. *BUBON Galbanum*.

Shrubby Galbanum-bearing Bubon.] Bubon with an erect woody-stalk growing eight or ten feet high, having a purplish-coloured powdered bark, leaves at the joints, composed of many rhomb-shaped, indented smooth folioles, and the stalks surmounted by yellow umbels in September, but no seeds in England.

3. *BUBON gummiferum*.

Shrubby Gummiferous Bubon.] Bubon with an erect woody stem, garnished below with leaves composed of many rhomboid, sawed, smooth folioles, those above pinnatifid, narrow, and tridentate, and the stalks crowned by white umbels in September, but rarely any seeds here.

These two shrubby kinds, on breaking any part of them, impart a gummy cream-coloured matter, of which is prepared the *Galbanum* of the shops.

The *Bubon macedonicum* is cultivated in some gardens for variety. It is propagated by seeds in spring, sown in a bed of common earth, and in autumn transplant the plants into a warm border, and some in pots for occasional shelter. In two or three years they will flower and perfect seeds, then generally perish.

The two shrubby Bubons are natives of Africa, and require shelter of a green-house here in winter, so must always be cultivated in pots.

They are raised from seed procured from Africa, sowing it as soon as possible in pots of light earth, to be occasionally sheltered from frost, and in spring plunge them in a hot-bed, where the plants will rise, and be fit to plant in separate small pots in May or June, plunging them also in a moderate hot-bed, and supply them with occasional shade, water, and fresh air, to which fully expose them in July, and in October remove them to the green-house.

BUCHNERA.

A genus of African shrubby plants garnished with evergreen spear-shaped leaves and monopetalous flowers.

Class and order, *Didynamia angiospermia*.

Characters.] CALYX monophyllous, slightly indented and permanent. COROLLA, monopetalous, the tube long, slender, and bent, with the border cut in five heart-shaped segments. STAMINA, four very short filaments, topped with oblong antheræ. PISTILLUM, an oval-oblong germen, slender style, and obtuse stigma. PERICARPIUM, an oval-oblong pointed capsule, having two cells, containing many angulated seeds.

There are several species of this genus; the principal sort for our purpose is,

BUCHNERA viscosa.

Clammy Buchnera.] Rises with a shrubby upright stalk branching upwards, garnished with linear spear-shaped leaves slightly indented; the branches are terminated by spikes of purple-red coloured flowers, appearing great part of the summer.

This plant being a native of the Cape of Good-Hope, requires the protection of a green-house in winter; it is easily propagated from cuttings in the summer, observing to water and shade them till they are rooted, when they must be planted singly in pots.

BUDDING, or Inoculating, a principal mode of propagation in trees and shrubs.

It consists of the operation of inserting a bud of any particular tree into the stem or stock of another by incision, introducing it between the rind and wood thereof, which uniting with the said stock or stem, the head of which being then cut off, the inserted bud shoots forth into a strong shoot, that in process of growth becomes a new tree, the same in all respects as the parent tree from which the bud was detached: and thus all our choice sorts of fruits are propagated, and many other curious varieties of trees and shrubs:—but for the particulars, and general method, see INOCULATION.

BUDDLEA, *Buddlea*.

It comprises three shrubby plants of the stove and green-house, decorated with simple leaves and monopetalous flowers in spikes.

Class and order, *Tetrandria Monogynia*.

Characters.] CALYX is small, divided into four parts, and permanent. COROLLA, a bell-shaped quadrifid petal. STAMINA, four short filaments in the divisions of the corolla, and short antheræ. PISTILLUM, an oval germen, short style, and blunt stigma. PERICARPIUM, an oblong capsule of two cells, and numerous seeds.

The species are,

1. *BUDDLEA americana.*

American Buddlea.] Buddlea with a woody, whitish stem and opposite branches, growing

eight or ten feet high, garnished with oval, sawed, opposite leaves, downy underneath, and yellow flowers in branching spikes from the ends of the branches.

2. *BUDDLEA occidentalis.*

Occidental Buddlea.] Buddlea with a woody, rustety-barked stem, growing fifteen or eighteen feet high, sending out many slender branches, adorned with spear-shaped, pointed, entire leaves, placed opposite, and large, loose, whorled spikes of white flowers at the end of every branch.

These two plants are of American growth, and preserved here in our stoves for variety.

They are propagated by seeds procured from America, which sow in pots of light earth; plunge them in a hot-bed, and give light waterings thrice a week, and the plants are to be transplanted into separate pots, and placed again in the hot-bed, or in that in the stove, where they must be always continued.

To these two species may be added,

3. *BUDDLEA globosa.*

Round-headed Buddlea.] With a woody, quadrangular stem, furnished with large lanceolate leaves slightly indented and placed opposite in pairs: from the junction of the leaves arises at each joint a cluster or little round head of beautiful yellow flowers supported by a long quadrangular foot-stalk. This species may be kept in a green-house, though it will succeed in the open ground in warm, well-sheltered situations, producing abundance of blossoms, but must be well protected from the frosts:—the flowers come out in May and June, and the propagation is by cuttings or layers.

BULBOCODIUM, Mountain-Saffron.

Two species only belong to this genus, small bulbous-rooted, flowery perennials of the common ground, having funnel-shaped, hexapetalous purple flowers three or four inches high, six stamina, and one style.

The species are,

1. *BULBOCODIUM vernum.*

Spring-flowering Spanish Bulbocodium, with spear-shaped concave leaves.

2. *BULBOCODIUM scrobinum.*

Late-flowering Mountain Bulbocodium, with narrow rush-like leaves.

They may be propagated by off-sets at the decay of the flower and leaf every second or third year; also by sowing the seed in pots in autumn, sheltering them in a frame from frost, and the plants will appear in spring, which, at the decay of the leaves, may be taken up for planting in the borders in October, where they will flower the year following.

BULBUS, a Bulb, or Bulbous root, *Ra-*
dia

dix Bulbosa; or, according to naturalists, a kind of great bud produced under-ground upon the crown of the root of certain herbaceous perennials, such as the onion, lily, tulip, &c. hence denominated Bulbous-rooted plants.

In Bulbous plants, what we commonly call the root is defined to be only a sort of large bud, composed mostly of the rudiments of leaves, which inclose and secure the embryo of the future shoot of the flower; for, at the lower part of this bulb, may be observed a fleshy knob or tubercle, from which proceed a number of fibres attached thereto, is properly speaking the true and genuine root from which the flower-stem immediately rises, and that the upper part or bulb is, as before hinted, in most sorts, a compendium of the herb, and rudiments of the future leaves, before they begin to grow, serving for a certain time as a cradle or nursery to defend from the injuries of weather the embryo plant, that is, the leaves and future flower-stem in miniature, which, after being repaired a certain number of times annually, the whole bulb and root perishes, not, however, till it has produced from its sides annually several smaller bulbs, off-sets, or suckers, for perpetuating the species; for each sucker becomes an individual, producing flowers and seed like the parent; forms also new suckers, which, in their turn, produce others, and in this manner multiply the species as certainly as the seed: for it is observable, that the remains of the former leaves sunk below, and the rudiments of the future ones, forming several coats or rinds, whereof the bulb consists, successively perish and shrink up into so many dry skins, betwixt which, and in their centre, are formed other leaves and rinds, and thus the bulb is perpetuated, till arrived at a certain state of growth.

Bulbous-roots differ essentially from tuberous-roots, which consist of an entire solid fleshy substance, as turnep, potatoe, carrot, radish, &c. See TUBEROUS ROOTS.

Of Bulbous-roots there are three principal tribes or kinds, distinguished under the appellation of—Tunicated Bulbs—Solid Bulbs—Squamous Bulbs.

Their descriptions are,

1. **BULBUS TUNICATUS**, Tunicated, or Coated Bulbs, composed of several tunics, or coats, closely enfolding each other, as in the *Allium Cepa*, or onion, &c.

2. **BULBUS SOLIDUS**, Solid Bulbs, such as consist of a solid, compact substance, without any divisions, or coats, as in tulip.

3. **BULBUS SQUAMOSUS**, Squamous, or

Scaly Bulbs, consisting of many scales, or thin plates, or small oval parts placed over each other imbricatum, i. e. in the manner of scales of fish, or tiles on an house, as in the *Lilium*, or lily.

The above three kinds of bulbs comprehend some esculents of the kitchen-garden, such as garlick, onions, leeks, shallots, &c. and a numerous train of flowery plants, mostly herbaceous perennials, producing beautiful garden-flowers, and most of them hardy enough to succeed in beds and borders in the full ground; some in a stove and green-house.

The principal Bulbs of the flowery tribe are of the following genera:

Amaryllis, including the Guernsey lily, bella-donna lily, Jacobæa lily, &c.—Narcissus, or daffodil, including jonquils—hyacinth—tulip—fritillaria, and crown-imperial—Lily, including martagons—ornithogalum, or star of Bethlehem—galanthus, or snow-drop—leucojum, or great snow-drop—scilla, or sea-onion—colchicum—albuca, or bastard star of Bethlehem—muscaria, or musk and grape hyacinth—iris, the Bulbous and Persian—hæmanthus, or blood-flower—Allium, or moly—crocus, including spring and autumn kinds—bulbocodium—pancratium, or sea daffodil. For the different species and varieties of each sort, see their respective genera.

Most sorts of Bulbous-roots multiply exceedingly by off-sets, by which every particular sort is continued, and new varieties are obtained from seed. See the culture of the respective sorts.

Bulbous-plants for the most part may be said to be perennial, for, although the same individual root exists but for a certain time, some not more than a year after having attained a flowering-stalk, others longer, they, previous to their dissolution, afford from their sides a supply of suckers or off-sets to perpetuate the respective kinds; so that, at the end of many years, what is still often considered as the same individual root, is, in reality, another, as to every particle thereof.

All Bulbs renew their leaves and flower-stems annually, and their principal season of flowering is at different times, from February and March to October, some producing their flowers at one time, and their leaves at another, as in some species of amaryllis and colchicum; others produce their flowers and leaves together, as the hyacinth, tulip, narcissus, &c. and the leaves and flower-stem of all the sorts perish annually, at a certain period after flowering, at which time the root begins its period of rest, drawing no nourishment from the ground, remaining in that inactive state six weeks

weeks or two months; within this period of inactivity of these roots, before they put out new fibres to prepare for the future flower, is the only proper time to remove them, either to separate the off-sets for propagation, or to plant the roots in fresh prepared earth, or remove them to any other part of the garden, or to send to any distance; or likewise to reserve the Bulbs out of ground for autumn and spring planting, when the beds or borders can be more conveniently prepared again for their reception; for most sorts, taken up at the above-mentioned period of rest, may be kept out of ground several months; or, if occasion requires, some sorts will admit of keeping out of the ground, from the time the flowers and leaves decay in May, June, or July, until the following spring, as often practised, when intended for spring planting, to obtain a longer succession of bloom, by succeeding that of the autumn plantation: though Bulbs may remain several years unremoved; and, when greatly increased by off-sets, then taken up at the proper period, as above, to separate the increased progeny, and replanted again either directly, or kept longer, as above.

It is, however, particularly necessary to take up all the choice kinds of Bulbs annually, to separate the off-sets for increase, as well as to fresh prepare the earth of the beds and borders, to promote the merit of the succeeding year's bloom; this is particularly proper for the curious tulips, hyacinths, narcissus, &c. as to the more inferior sorts of Bulbs in general, they should also be removed every other year, or as often as their off-sets are considerably increased in number, which, if permitted to remain so long as to increase into large bunches, they will cramp each other in growth, and produce but small ill-nourished flowers.

It is also proper to remark, that all Bulbs taken up at the above period of rest in summer, I should advise, where practicable, to plant the principal part again the following autumn, in October or November, as they will flower much stronger than those kept out of ground till spring.

BULBUS CAULINUS, a Cauline, or Stem-Bulb, i. e. Bulbs growing on the stem or stalk, opposed to those before described, which grow only under-ground upon the root.

These Stem-bulbous plants have also a Bulbous root under-ground, from which springs the stem that produces the Cauline Bulbs here alluded to, which plants are denominated bulbiferous, or bulb-bearing; of this kind are several species of *Allium*, such as common garlick, rocambole, tree onion, and several others of that genus, bearing several Bulbs, or

small cloves, on the summit of the stem, at the origin of their umbel of flowers, which, being planted, freely grow, become plants, and bear Bulbs as above; so that these kinds of bulbiferous plants are increased both by the off-sets from the root or main Bulb under ground, as well as those elevated upon the stem: the same obtains in some species of lily, such as the *Lilium bulbiferum*, the bulb-bearing and fiery lily; also often in ornithogalum, or star of Bethlehem, and some other liliaceous plants, which emit bulbs at the wings or angles of the leaves.

By the situation of these kinds of Cauline Bulbs, on different parts of the stem, furnish essential marks for distinguishing certain species.

BUPHTHALMUM, including the *Asteriscus*, or Ox-Eye.

This genus furnishes herbaceous and shrubby plants, proper for the embellishment of the pleasure-ground and green-house, all of which are garnished with simple leaves, and compound, radiated, and mostly yellow flowers.

Class and order, *Syngenesia Polygamia Superflua*.

Characters.] **CALYX**, a compound radiated flower, having an imbricated general cup, inclosing numerous florets. **COROLLA**, many hermaphrodite and female florets; the former compose the disc, the latter the radius. **STAMINA**, in the hermaphrodite florets five filaments, having cylindric antheræ. **PISTILLUM**, in the hermaphrodite florets, an oval germen, single style, and stigma; in the females a double-headed germen, simple style, and two stigmas. **PERICARPIUM**, none; a single naked seed in each floret.

The species of most account are as follow: the first three are hardy herbaceous perennials of the full ground.

1. **BUPHTHALMUM helianthoides.**

Helianthus-like American Ox-Eye.] Buphtthalmum with a perennial root, and annual stalks four or five feet high; oval-heart-formed, three-veined, sawed leaves, placed opposite; and the branches terminated by large, radiated, yellow flowers, in leafy cups, appearing in July and August.

2. **BUPHTHALMUM salicifolium.**

Willow-leaved Alpine Ox-Eye.] Buphtthalmum with a perennial root, and annual stalks about two feet high; spear-shaped, sawed, hairy leaves, placed alternate; and the branches ending in radiated, bright, yellow flowers, in naked cups, appearing in June, July, and August.

3. **BUPHTHALMUM grandiflorum.**

Great-flowered smooth Willow-leaved Ox-Eye.]

Eye.] *Buphthalmum* with perennial roots; annual stalks two feet high; narrow, spear-shaped, smooth, slightly-indented leaves; and radiated yellow flowers, in naked cups, at the end of the branches.

The three following are of shrubby growth, and require shelter in winter.

4. *BUPHTHALMUM maritimum.*

Maritime Sicilian Ox-Eye.] *Buphthalmum* with a perennial root; very branching, perennial, firm stalks, about a foot high; wedge-shaped, hairy, alternate leaves; the branches crowned by radiated yellow flowers in blunt leafy cups, peduncled;—flowering most part of the year.

5. *BUPHTHALMUM frutescens.*

Shrubby Jamaica Ox-Eye.] *Buphthalmum* with woody stalks and branches, rising eight or ten feet high, adorned with spear-shaped, silvery, hoary leaves, of very different sizes, placed opposite on foot-stalks, having two teeth near the base of each leaf, and pale yellow flowers in scaly cups from the ends of the branches, appearing from July until October.

Variety.] Shrubby Ox-Eye with thick oblong leaves, having no teeth on the foot-stalk.

6. *BUPHTHALMUM arborescens.*

Tree Bermudas Ox-Eye.] *Buphthalmum* with several shrubby stems directly from the root about a yard high, ligneous below, and succulent above, garnished with spear-shaped, thick, succulent, smooth, green leaves, placed opposite, and bright yellow flowers on longish foot-stalks at the ends of the branches, in July, August, and September.

Variety.] Shrubby Bermudas Ox-Eye with hoary leaves.

All these six species are exotics, though the three first are hardy, the other three are tender; all of which flower here very ornamentally in summer and autumn, but rarely any but the three first sorts afford seed in this country.

The first three species being hardy flowering perennials that prosper in any common soil, are proper furniture for the ornament of large gardens, in spacious borders, or in vacant spaces towards the fronts of the shrubbery compartment, where they will effect variety, and appear very ornamental several months in summer.

The fourth sort, *Buphthalmum maritimum*, or Sea Ox-Eye, requires shelter from frost, so must be cultivated in pots, and in winter placed in or near a green-house or garden-frame, to have occasional shelter thereof in bad weather.

The fifth and sixth sorts and varieties require constant shelter of a green-house in winter, so must be always continued in pots, and

placed to accompany the exotics of that department.

Propagation of all the Sorts.

The three first herbaceous kinds multiply freely by their roots, and by which they may be propagated abundantly in autumn or spring, either by taking off some slips from the roots, or to take them up, and divide them wholly into several parts, planting the slips in the places where it is designed they shall remain.

They may also be propagated plentifully by seeds, in a bed of common earth, in spring or autumn.

The Maritime sort, and the other two shrubby kinds, are propagated easily by cuttings of their branches, any time from April to July, planting them in pots of light earth, which, if plunged in a moderate hot-bed, will facilitate their rooting greatly, though those planted in June and July will frequently emit roots tolerably well without that assistance, allowing occasional shade and waterings.

After they are struck, and advanced a little in growth, plant them in separate pots, and let them remain in the full air till the end of October, then move them to the places of shelter before mentioned.

BUPLEURUM, Hare's-Ear, and Shrubby Æthiopian Hart-wort.

This genus retains both herbaceous and shrubby plants; the former possess little merit, but of the latter are two or three beautiful evergreen shrubs, one for the shrubbery, the others for the green-house.

Class and order, *Pentandria Digynia.*

Characters.] *CALYX*, umbelliferous flower, having a many-leaved involucre to the general umbel, and to the smaller umbels but five leaves; the main umbel composed of about ten smaller ones, and scarce any calyx to the florets. *COROLLA*, each floret composed of five whole inflexed petals. *STAMINA*, five filaments, and roundish antheræ. *PISTILLUM*, a germen below the corolla, two reflexed styles, and minute stigmas. *PERICARPIUM*, none; a roundish compressed two-parted fruit, having two oblong seeds.

The species that merit culture are,

1. *BUPLEURUM fruticosum.*

Shrubby Hare's-Ear, or Æthiopian Hart-wort.] *Bupleurum* with a shrubby stem, dividing into numerous branches, forming a bushy head five or six feet high, adorned with oblong-oval, entire leaves of a pale-green colour, placed alternate, and yellow flowers in umbels at the ends of the branches, in July and August, sometimes succeeded by ripe seeds.

2. *BUPLEURUM difforme.*

Difform-leaved Shrubby Cape Hare's-Ear.]

Bupleurum

Bupleurum with a shrubby branching stem, growing five or six feet high, garnished with two-formed leaves, the spring leaves being decomposed of many plane finely-cut lobes, succeeded in summer by others that are long, narrow, rush-like, angular, and trifid, growing in clusters, and greenish flowers in spreading umbels at the ends of the branches in July, succeeded by seeds in autumn.

3. *BUPLEURUM fruticosum*.

Under-shrubby, grass-leaved Ethiopian Hare's-Ear.] *Bupleurum* with a shrubby branching stalk of moderate growth, with narrow-linear leaves, and small umbels of flowers at the ends of the branches in July.

The first of these species has great merit as a hardy evergreen for the shrubbery, though it was formerly retained as a green-house plant, being deemed too tender to prosper in the full ground; but experience has proved it to be of a tolerable hardy temperature, so as to succeed in the open air all the year in a dry soil; and being a handsome bushy shrub, makes a fine appearance in the fronts of the shrubbery clumps.

The second and third species being tender, must always be retained in pots, to have the shelter of a green-house in winter.

Propagation.

All the sorts may be propagated both by seeds and by cuttings.

The seeds may be sown in autumn, soon after they are ripe, in pots of light mould, placing them in a frame, to have shelter from frost in winter, and in spring plunge them in a hot-bed, particularly the two green-house kinds, which will soon bring up the plants; these are to be inured to the full air, and transplanted into separate small pots, giving shade and occasional waterings all summer; and in October placed in a green house or frame; and in April following those of the first sort may be planted in the nursery.

By cuttings they may be raised in spring in pots of light earth, plunging them in a moderate hot-bed, where they will readily take root.

But the common Shrubby *Æthiopian Hartwort* may also be raised by cuttings in the common ground, planted in July, August, or September, and sheltered occasionally from frost during winter; or they may be planted in pots at the above time, and placed in a garden-frame for occasional shelter from frost; and in either method the cuttings will emit roots in the spring, giving water freely all summer, and shelter again in winter; and in spring following plant them out in a sheltered place in the nursery, to obtain proper growth for the shrubbery.

BUTOMUS, Flowering Rush, or Water Gladiolus.

There is but one species, an herbaceous, flowery, perennial aquatic, of tall growth, crowned by umbellate flowers.

Class and order, *Enneandria Hexagynia*.

Characters.] **CALYX**, umbellate flowers in a single umbel, having a three-leaved involucre. **COROLLA**, each floret of the umbel is composed of six roundish concave petals. **STAMINA**, nine awl-shaped filaments, and double lamellated antheræ. **PISTILLUM**, six oblong-pointed germina, and single stigmata. **PERICARPIUM**, six oblong-pointed capsules, having single cells filled with oblong seeds.

The species is,

BUTOMUS umbellatus.

Umbellated Butomus.] *Butomus* with a thick, oblong, fibry root, crowned by many long sword-form leaves, and a thick, strong, smooth flower-stalk, from three to six feet high, ornamented at top by a large umbellate cluster of flowers, in June and July, succeeded by abundance of seed.

Varieties of this are,] White-flowering *Butomus*—Red-flowered *Butomus*—Deep-purple-flowered *Butomus*.

These plants are aquatics, and adorn our river-sides, and other watery places, in most parts of Britain; but as they produce very ornamental flowers, all the varieties merit culture in gardens, accommodated with situations properly adapted for their growth, such as in very moist places, by the sides of any piece of water, rivulet, or any place of copious moisture, where the roots may be mostly in water, particularly any boggy or marshy part, where these and several other of the aquatic tribe may be introduced, which will flourish, and render such places very ornamental.

Their propagation may be effected by seed, or by the roots.

By seed, it may be sown thick in any watery or boggy place, as above, as soon as it is ripe, and left to nature. By roots, they may be removed any time after flowering, and such that admit of it, may be divided, planting them at once in the places allotted them, where they will abide for years, and flower annually.

BUXUS, the Box-tree.

The plants of this genus are hardy evergreen shrubs, well calculated for ornamental purposes in shrubbery works, &c. of which there are but two species, one of them a large shrub, that admits of several beautiful varieties proper for evergreen plantations; the other is also a pretty evergreen of very dwarfish growth, but its chiefest merit is for forming

edgings

edgings to flower-beds and borders, for which purpose it is superior to all other plants.

The wood of the large sort is also of singular value for innumerable different sorts of curious utensils.

Class and order, *Monœcia Tetrandria*.

Characters.] CALYX, male and female flowers; the males have a three, and the females a four concave-leaved cup. COROLLA, in the males two, and the females three small concave petals. STAMINA, the males have four filaments, and double antheræ. PISTILLUM, the females have a roundish trigonous germen, three short styles, and hispid stigmas. PERICARPIUM, a roundish trilocular capsule, each cell having two oblong seeds.

The species are,

1. *BUXUS arborescens*.

Tree-Box.] *Buxus* with a tree-like stem, dividing into numerous branches, forming a regular head, growing twelve or fifteen feet high, and very closely adorned with small stiff shining leaves.

Varieties of this.] Tree-Box with oval leaves, or Broad-leaved Tree-Box—Tree-Box with narrow leaves, or Narrow-leaved Tree-Box—Silver-striped-leaved Tree-Box—Silver-edged-leaved Tree-Box—Gold-striped Tree-Box—Gold-edged Tree-Box—Gold-tipped Tree-Box—Curled-leaved Striped Tree-Box.

2. *BUXUS suffruticosa*.

Dwarf Shrubby Box.] *Buxus* with many small, short, very branchy stems, immediately from the root, rising a foot and half high, closely adorned from the very bottom with small, round, stiff leaves.

Varieties.] Dwarf Shrubby Green Box—Dwarf Shrubby Striped Box.

The flowers of all these plants are very inconsiderable, so that the beauty of the shrubs consists in their numerous, closely-placed, shining, evergreen leaves.

All the sorts are so hardy, that they prosper in any exposure and soil, and no weather injures them.

The first species, *Buxus arborescens*, and its varieties, being of beautiful growth, are elegant furniture for the shrubbery plantations, for having numerous branches, very closely garnished with their small shining leaves, effect a very striking and agreeable contrast at all seasons, in assemblage with the larger-leaved evergreens.

This shrub is also sometimes used in forming low evergreen hedges for ornament, and is likewise sometimes planted as single objects, trained into pyramids, globes, &c.

This sort merits culture also for its wood, which, being very hard, is of singular use to

the mathematical-instrument-makers, engravers, and turners, for making innumerable small utensils.

The wood is so compact and heavy, that it will sink in water.

If, therefore, any one would cultivate this tree for its wood, may plant it on almost any dry poor soil, even on the declivities of chalky or gravelly barren hills, where they will grow freely, as is evident by the vast numbers that adorn Box-hill in Surry, about twenty miles from London, which bring a considerable income to the owner; and what is remarkable, the wood is sold by weight, at so much per pound, which renders it still more valuable to the cultivator.

The second species, Dwarf Shrubby Box, is a valuable little plant, for its usefulness in forming edgings to beds and borders, for which use there is no plant so proper; it fixes its roots so firmly in the ground, and its branches coming out so thick and close to the very surface, that it answers effectually the purpose of a beautiful edging, and of securing the earth of the beds or borders from being forced out, either by heavy rains, or doing the necessary work; so that as an edging, it is both useful and ornamental.

It may also be trained as a dwarf shrub, permitting it to take its natural growth, when it will make proper furniture for the fronts of small clumps.

This sort is also, by the gardeners about London, trained in different figures, as globes, pyramids, and the like, for market, which, as it bears the smoke, is proper to plant in pots, to adorn court-yards and balconies.

Propagation of all the Sorts.

The Tree-Box and varieties may be raised abundantly by seeds, layers, and cuttings, though the two latter are the methods by which they are most commonly propagated, and indeed is the only method of propagation for the variegated sorts, so as to continue the different kinds with certainty.

If it is, however, intended to raise the common green sort by seed, sow it in autumn soon after they ripen, in a border of light earth half an inch deep, and the plants will come up in spring, and in two years will be fit to plant out in the nursery-lines.

To increase them by layers, it may be done any time in the year; but the spring is the most eligible season, any time in March or April; or in the autumn, in September or October: they will be rooted for planting off the autumn following.

Cuttings of all these tree sorts may be planted in autumn, or any time in the spring, but the

the sooner the better: chuse shoots of one or two years' wood, about six or eight inches long; plant them in a shady border half way in the earth, and six inches distance, and give water in dry weather.

The Dwarf Box propagates very plentifully by numerous off-sets or suckers from the roots, which may be parted any time from September to April, or even later, upon occasion; observing, those of them you intend to train as shrubs, are to be planted singly in rows in the nursery a foot asunder; but when intended for edgings, they are to be planted close to one another, in the following manner.

Of planting the Dwarf Sort for Edgings.

As before noticed, the Dwarf Box is the best plant for edgings, and its propagation is effected abundantly by dividing the plants into as many parts as are furnished with fibres; also the slips of the branches, having no roots, will grow: but as the plants increase greatly from the bottom, furnished with plenty of fibres, and are easily parted, it is most advisable, for edgings, to use entirely those slips that are provided with roots.

For the purpose of edgings, such plants as are short and bushy are to be preferred, rejecting such as have long, naked, sticky stems and branches, and preference is to be given to those whose roots are short and very fibrous.

The plants are cultivated for sale, purposely for edgings, in many places, particularly in the nurseries and other gardens about London, which being planted in close rows in the manner of edgings, is commonly sold by measurement, generally about six-pence per yard, running measure, and one yard of good close Box will, when parted, plant three or four.

In slipping or parting the Box for edgings, it is not proper to divide it into very small slips, and, if possible, let each slip be furnished with fibres; for although the naked or rootless slips will grow, they are improper to be planted with the rooted plants, because many may fail, and occasion gaps in the edging. The plants when slipped should be trimmed at root and top, cutting off or shortening long sticky roots, and only trim the straggling tops even; but by no means cut them too close to appear stubby.

The manner of planting the edging is this.

To plant a close regular Box-edging, the edge of the bed or border which is to be planted must be made up full and even by line, then a slight trench must be cut about six inches deep, in which to plant the Box almost to the top, according to the following directions.

In the first place, proceed to stake out the intended width of your border, walk, &c. and

place for the edging; then, if not done before, dig the edge along full and regular, and directly tread the top evenly all the way, to settle the earth equally, that it may not sink in hollows hereafter; then, having previously marked on the stakes the proper height and level for the edging, stretch a line, if for straight work, along the edge, agreeable to the said mark of level, and with a spade make up the ground even to the line, finishing it level and smooth about a spade's-breadth all the way along the top; this done, strain the line tight, and proceed to cut out a slight neat trench for the reception of the edging: the trench must be cut on the walk-side of the line, about six inches deep, cutting the side next the line nearly perpendicular, and as even as possible, turning the earth thereof towards the walk or alley, and it is then ready for the plants.

Or for a serpentine edging, where a line cannot be used, make up the edge as above advised; then with the point of your knife edge-ways draw along the top the serpentine form intended, in a small very thin score as lightly as possible, not to loosen the top surface in that part; and then with the spade cut out a trench accordingly, in the manner as above.

The Box being trimmed, as before directed, proceed to planting, placing the plants close against the upright side of the trench, and so close together, as at once to form a close and regular edging, with the tops all of an equal height even with the line. As you proceed in planting, draw with the hand a little earth up to the plants, just to fix them in due position till the line or row is finished, then with the spade trim in the remainder of the earth almost even with the tops of the edging, and press it evenly thereto with the foot, to fix the plants as they are to remain, and the work is finished.

When the edging is planted, observe, if there are any irregular parts, projecting either on the sides or top, go over it lightly with the garden-shears, or knife, and trim off any such irregularities.

If these edgings are planted late in the spring, or early in autumn, while the dry hot weather continues, it will be necessary to give occasional waterings, but more particularly those planted late in spring.

As to the general culture of these Box-edgings, it consists principally in clipping or shearing them with garden-shears once a year at least, to continue them in regular order, and within due bounds, in respect to height and breadth, for they should not be suffered to grow above three inches high; nor more than about two broad, for if more than that, they assume a clumsy appearance, and make the beds

beds or borders seem hollow: besides, when permitted to grow high and thick, they afford harbour for slugs, snails, and other destructive vermin.

The most proper season for clipping these edgings is May or June, or occasionally any time in summer: this is to be understood of those that are cut only once a year: but, to have them continued perfectly neat, they should be cut twice every summer; first in May, or beginning or middle of June, and the second cutting in August or September; or, where edgings have been omitted clipping in summer or autumn, and remained rough all winter, they may be cut regular in the spring, in March or April.

It is advisable, in the summer, to clip them in

moist weather, as they then cut freer, and the beauty of the edging is better preserved, than when shorn in a dry and hot time, which is apt to occasion the leaves to turn brown, and have a rusty, unsightly appearance for a long time. The same also happens when cut early in spring while frosty nights prevail.

When any of these edgings are grown very broad and clumsy, they should be taken up, flipped or parted, and replanted in a compact neat edging as above directed. The same should likewise be practised to such edgings as have large gaps in different parts, and such also as are irregular by having high and low places, and where the plants have become naked and stubby.

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CACALIA, Foreign Colt's-foot.

This genus furnishes some hardy, herbaceous, tall, flowery perennials of the common ground, and some of shrubby growth for the green-house, garnished with simple leaves, and compound flowers in umbels at the ends of the stalks and branches.

Class and order, *Syngenesia Polygamia Æqualis*.

Characters.] **CALYX**, compound flowers, having many florets included in an oblong, scaly, general cup. **COROLLA**, several tubulous funnel-shaped florets, five-parted at top. **STAMINA**, five small filaments, and cylindric antheræ. **PISTILLUM**, an oblong germen, slender style, and two oblong revolute stigmas. **PERICARPIUM**, none; a naked seed in each floret, crowned with down.

There are many species; the principal and most noted sorts that merit culture in our gardens, consist of three hardy, herbaceous, ornamental, flowering perennials, and four shrubby, succulent green-house plants.

Hurdy Herbaceous Kinds.

1. **CACALIA alpina.**

Alpine Purple Cacalia.] Cacalia with fleshy, spreading, perennial roots, kidney-heart-shaped, acute, indented, thickish leaves, on long foot-stalks; and upright, herbaceous

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stems, a foot and half high, branchy upward, with all the branches terminated by a broad thick corymbus of purple flowers, in June, July, &c.

Varieties.] Smooth green-leaved—Hoary-leaved—Hairy thick-leaved.

2. **CACALIA suaveolens.**

Sweet-scented Canada Cacalia.] Cacalia with creeping, spreading, perennial roots; strong, erect, herbaceous stems, six or seven feet high, garnished with triangular, halbert-shaped, arrow-pointed, indented leaves, placed alternately; and the stalks terminated by corymbi of white sweet-scented flowers in July, August, &c.

3. **CACALIA atriplicifolia.**

Atriplex-leaved Virginia Cacalia.] Cacalia with a thick perennial root, composed of many spreading fleshy tubers, sending up strong, herbaceous, annual stalks, four or five feet high, garnished with roundish-heart-shaped, indented-sinuated leaves, placed alternate; and the stalks crowned by umbellate bunches of yellow flowers, having five florets in each cup, appearing in July, &c.

The above three herbaceous species of Cacalia flower annually in June, July, and August: succeeded by plenty of ripe seed in September and October; then their stalks soon

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after die to the ground, and new ones rise from the roots in the spring.

Tender Shrubby Kinls.

The four following are shrubby, succulent, African exotics for the green-house.

4. *CACALIA Ficoides.*

Ficoides-leaved African Cacalia.] *Cacalia* with shrubby, strong, round, succulent stems and branches, growing seven or eight feet high; compressed, fleshy, succulent, taper leaves, ending in a point, covered with a mealy powder; and the branches terminated by small umbels of white flowers, in autumn, winter, or spring.

5. *CACALIA Kleinia.*

(Kleinia)—or *Oleander-leaved Canary Cacalia*; or *Cabbage-stalked-tree*, sometimes called *Carnation-tree*.] *Cacalia* with a thick, upright, succulent, compound stem, composed of many oblong, swelling divisions or joints, dividing above into irregular branches of similar growth; long, narrow, flat leaves; their foot-stalks, as they fall off, leaving obsolete scars, as in a cabbage stalk; and the branches terminated by large clusters of carnation-coloured flowers, from July or August till October.

6. *CACALIA papillaria.*

Papillarius, or *Rough-stalked Cacalia of the Cape of Good-Hope*.] *Cacalia* with a shrubby, large, succulent stem, branching irregularly, and narrow succulent leaves, which falling from their foot-stalks, these remain truncated on the stem and branches like thorns.

7. *CACALIA Anteuphorbium.*

(Anteuphorbium)—or *Oval-leaved Cape Cacalia*.] *Cacalia* with several slender succulent stems, dividing upward into many irregular, similar branches; ovate-oblong, flat, succulent leaves, placed alternate; the footstalks having three lines at the base underneath, running along the branch on which they are situated.

The first three species and varieties are very hardy herbaceous perennials of the flowery tribe, which, although not of any striking beauty, are proper furniture for large pleasure-grounds, to increase the variety in spacious borders, or in the clumps between deciduous shrubs, or the borders of shady walks, &c. they will flower in summer and autumn, terminating the stalks and branches in corymbose umbels, white, greenish, and purple, in the different species, and succeeded by ripe seeds in autumn.

Their propagation is by dividing their roots any time in autumn or spring.

They may also be raised abundantly by

seeds, either sown, or permitted to scatter, which, by means of their downy pappus, are often waisted to a considerable distance, and where they fall come up freely.

The four shrubby succulent sorts, requiring a green-house here all winter, must always remain in pots of light sandy earth, giving moderate waterings in summer, but as little as possible in winter, as being of a very succulent nature.

These plants, being singular in their growth, merit a place in every curious collection.

Their propagation is easily effected by cuttings of their branches, any time from March to July. Let the cuttings be five or six inches long, permitting them to lie a fortnight to heal the cut part; then plant them in pots of light mould, which you may plunge in a moderate hot-bed; though those planted in summer generally take root freely without such assistance.

CACTUS, Melo-Cactus, Melon-Thistle; includes also the *Cereus*, or Torch-Thistle, and Creeping Cereuses, &c. and the *Opuntia*, or Indian Fig.

This genus furnishes a curious collection of succulent exotics, of singularly strange and different growths, inhabitants mostly of the hot parts of South America, and the West-India islands, and retained here for curiosity in our stoves and green-houses.

Class and order, *Icosandria Monogynia*.

Characters.] *CALYX*, a monophyllous, tubular-concave, deciduous cup. *COROLLA*, many broad obtuse petals, the exterior ones short, the inner ones largest and connivent. *STAMINA*, numerous filaments inserted in the calyx, and erect antheræ. *PISTILLUM*, a germen below the receptacle, cylindric style, and headed multifid stigma. *PERICARPIMUM*, an oblong baccaceous fruit of one cell, having numerous seeds.

As the *Melo-Cactus*, or Melon-Thistle, assumes very different structures and appearances from the *Cereus*, or Torch-Thistle, and Creeping Cereuses, and the *Opuntia*, or Indian Fig, many still consider them as three different genera; but their characters being the same, Linnæus ranges them all in the genus *Cactus*, under which we shall also place them, though, for distinction sake, in three different classes, i. e. the *Melo-Cactus*, or Melon-Thistle; the *Cactus-Cereus*, or Torch-Thistle, and Creeping Cereuses; the *Cactus Opuntia*, or Indian Fig.

First Class, the Melo-Cactus, or Melon-Thistle.

The species of *Cactus*, called Melon-Thistle, are plants of very singular structure, being shaped like a great melon, having neither visible

visible stem, branches, nor leaves, but appear like a large roundish fleshy mass or lump, sitting close to the earth, growing a foot to a yard high, some deeply ribbed longitudinally, and all of them closely armed with robust thorns; and some are crowned with a large tuft of downy matter, intermixed with sharp spines.

There are but two real species of this sort, which are,

1. CACTUS, *Melo-cactus*.

(*Melo-cactus*)—or *Great Melon-Thistle*.]

Caetus, with a large, roundish, melon-shaped, fleshy, green body, ovate-globular form, growing one to two or three feet high, and half as thick, or more, having fourteen or fifteen longitudinal angles or ribs, closely beset with strong thorns along the ridge of each angle; and at top, a large prickly crown or cap, from which, round the upper part, are produced the flowers and fruit in circles.

Varieties.] *Great Melon Thistle*, with straight angles—with fifteen angles spirally twisted, and erect spines—with fourteen angles, and long recurved spines—with fifteen angles, and broad recurved spines—with fourteen angles, and white spines.

2. CACTUS *mamillaris*.

Mamillary Smaller Melon Thistle.]

Caetus, with a roundish-oblong melon-shaped body, growing a foot high, closely covered with ovate, bearded, downy tubercles, armed with bundles of reddish-brown spines; and between the tubercles issue the flowers round the middle of the plant, in July or August, succeeded by small crimson or scarlet fruit in autumn, continuing and ripening in winter, furnishing many seeds.

Varieties.] *Smaller Melon Thistle* with white spines—with red spines—Proliferous or childing, producing young plants from the sides.

Both the above species, and their respective varieties, are wholly perennial in root and top, and of many years' duration; they are of most singular appearance in their habit of growth: natives of the hot parts of South America and the West-Indies, growing in the crevices of rocks, having scarcely any earth for their support, where they obtain a large size, particularly the first sort, which grows three or four feet high, and half as much in diameter.

In this country they are preserved as plants of curiosity, and require the constant accommodation of our best stoves, and must be planted in pots of light sandy earth, placing them upon the top of the flues or shelves in winter, and in the bark-bed in summer, giv-

ing but very moderate watering in the hottest weather, and none at all in winter, they being of themselves very succulent and replete with moisture.

Their Propagation.

The propagation of these plants in England is by seed, in pots of light sandy earth, plunged in the bark-bed, where they will soon come up, which, after having advanced a little in growth, should be pricked in separate very small pots, plunging them also in the bark-bed, and they will make great progress, though it will be some years before they acquire any considerable size.

Young plants sometimes issue from the sides of the old ones; these may be taken off and planted, managing them as above.

But some, to have large plants as soon as possible, procure them from the West-Indies in tubs of dry rubbishy compost, being careful during the voyage to guard them from cold and every sort of moisture, and as soon as they arrive, plant them in pots, and plunge them in the bark-bed till rooted.

Second Class.

CACTUS CEREUS, the *Cereus*, or *Torch-Thistle*, and *Creeping Cereus*.

This class consists also of succulent perennial exotics of America, of singular structure in various different growths, and retained here for variety in our stoves, and some in green-houses.

Class, order, and characters, the same as the *Caetus Melo-Cactus*.

The Caetuses of this class are vastly different in structure and general habit from those of the preceding; those of this class advance with long, angulated, naked, succulent stalks; some erected singly like a column ten to thirty or forty feet in height, having neither branches nor leaves; others are of creeping growth, with long, climbing, rooting stalks, branching and mounting themselves upon support to a great distance, and some trail upon the ground; all of which are for the most part leafless, but most of them produce most elegant multipetalous flowers, which, in some of the climbing kinds, are of wonderful size and beauty, spreading like an umbrella a foot or more in diameter; and what is more remarkable in these, they appear only on nights, and are so extremely fugacious, that, opening fully about ten or eleven o'clock, they continue expanded only three or four hours, then begin to shut and fade, and by six or seven in the morning are quite closed, hang drooping, and in a manner withered and decayed, never opening any more, though they are often succeeded by fresh ones on the same plant the

following night; and those of all the sorts, in their native soil, are succeeded by a large, roundish, eatable fruit, but it rarely attains perfection in this country.

They are preserved here in many of our hot-houses as curiosities, and, as such, highly demand the attention of the curious.

The species of this class are,

1. *The Upright, or Torch Thistle kinds.*

Consist of very singular and curious perennial plants, growing each with a strong, erect, angulated, fleshy, succulent stem, armed with thorns, and of many years' duration in growth; some jointed, and some without either branches or leaves; others a little branched, some rising to a considerable height, twenty, or thirty, to forty-feet in an upright, naked growth, like a column, especially in their native soil, South-America and the West-Indies; and some have grown many feet high in this country in our hot-houses, &c. others are of more moderate stature, three or four to eight or ten feet in the different species; and in all the sorts the stems have several ridged angles longitudinally from the bottom upward, as follow:

1. *CACTUS-CEREUS hexagonus.*

Six-angled Greater Torch-Thistle of Surinam.] Cactus-Cereus, with an upright, strong, six-angled, succulent, branchless stem, growing like a column, twenty or thirty to forty feet high, the angles armed with spines in radiated clusters, and from the sides of the stem at the angles, large white flowers in prickly cups, on thick fleshy peduncles; sometimes appearing in this country in July or August, but rarely succeeded by fruit.

2. *CACTUS-CEREUS pentagonus.*

Pentangular, or Five-angled Jointed Torch-Thistle.] Cactus-Cereus with an upright, five-angled, jointed, slenderer, succulent stem, growing several feet high; and the angles armed with spines.

3. *CACTUS-CEREUS tetragonus.*

Four-Angled Smaller Torch-Thistle.] Cactus-Cereus with an upright, four-angled, succulent stem, growing four or five feet high, the angles distant, compressed, armed with spines, and emit several side shoots growing erect.

4. *CACTUS-CEREUS heptagonus.*

Seven-Angled Shorter Torch-Thistle.] Cactus-Cereus with an upright, shorter, oblong, seven-angled stem, the angles armed with spines.

5. *CACTUS-CEREUS repandus.*

Repandous or Waved Octangular Torch-Thistle.] Cactus-Cereus with an upright somewhat slender, eight or nine-angled suc-

culent stem, the angles compressed, repandous or waved, armed with clusters of spines longer than the down; and greenish-white flowers, succeeded by large, yellow, pear-shaped fruit; sometimes ripening in this country in hot-houses.

6. *CACTUS-CEREUS peruvianus.*

Peruvian Ten-Angled Torch-Thistle.] Cactus-Cereus with an upright ten-angled stem, growing six or eight feet high; the angles obtuse-blunt, armed with spines, producing sessile flowers, succeeded by smooth, berry-like, blood-red fruit.

7. *CACTUS-CEREUS lanuginosus.*

Woolly Nine-Angled Torch-Thistle.] Cactus-Cereus with an upright, slightly-nine-angled, thick, woolly stem, armed with spines shorter than the wool.

8. *CACTUS-CEREUS Royeni.*

Royen's Nine-Angled, Jointed Torch-Thistle.] Cactus-Cereus with an upright, nine-angled, jointed stem; the joints sub-ovate, and the spines and down nearly of equal length.

2. *Creeping-Cereus kinds.*

These grow with slender, creeping-climbing, and trailing stems; some ascend by their climbing stalks, emitting roots into any thing compact they encounter in their progress; and others with rootless, trailing-stalks, extend along the ground, or hang loosely down.

9. *CACTUS-CEREUS grandiflorus.*

Grand Night-flowering Creeping Cereus.] Cactus-Cereus with slender, creeping-climbing, five-angled, jointed, branching stalks, rooting at the joints into trees, walls, &c. thereby ascending many feet in length; producing very large snowy-white flowers, in exceeding large, spreading, bright-yellow cups, the whole expanding almost a foot diameter, of splendid beauty and most fragrant odour; blowing only at nights, opening in the evening, continue but a few hours, and, by next morning early, are finally closed, hang drooping, and decayed.

10. *CACTUS-CEREUS triangularis.*

Triangular Night-flowering Creeping Cereus.] Cactus-Cereus with creeping-climbing, triangular stalks, jointed, long extending, rooting and ascending upon any adjacent support of trees, walls, &c. and producing large, beautiful, white flowers.

11. *CACTUS-CEREUS flagelliformis.*

Flagelliform Small Creeping Cereus.] Cactus-Cereus with very slender, creeping, finely-ten-angled, roundish stalks, trailing, or hanging loosely about, flagelliform, or whipthong-like; producing many small, most delicate, bright-purple flowers, of several days' duration, succeeded by others on the same plant.

All these species of *Cactus-Cereus*, both of the upright or torch-thistle kinds, and the creeping *Cereuses*, are succulent perennial exotics, principally for the hot-house or stove, or some occasionally in the green-house; are perennial both in root and top, continuing their growth many years, ever green, or always assuming a green colour in their succulent stems or stalks, producing flowers at different periods, arising at the sides or angles, on short peduncles; each flower multipetalous, red, white, yellow, purple, &c. in the different species, appearing mostly in summer and autumn, but not all constantly in this country; and some not till they are of several years' growth.

They are all natives originally of the warmest parts of America, or principally of South-America, and the West-India islands, and in this country generally require the protection and heat of our hot-houses or stoves the greatest part of the year, or continued constantly in these repositories of artificial heat; for without that assistance, although most of the sorts will also succeed tolerably in a good green-house, and occasionally in the open air in hot, dry weather in summer, they, in general being apt to imbibe much moisture, and being themselves naturally of a humid quality, it sometimes occasions some of the more tender kinds to rot or perish in severe or very wet damp winters, when they have only the protection of a green-house, except they are kept exceedingly dry, and the cold damps and frost effectually excluded; nor will they, in general, flower so certain and frequent as when cultivated in a stove; but in want of a stove or hot-house, or of sufficient room therein, some or most of the torch-thistle kinds may be cultivated occasionally in the green-house, giving very little or no water in the winter season, and protected from too much wet in summer; though the two large creeping *cereuses* in particular, should generally be continued always in the hot-house, otherwise they will not succeed prosperously in a proper growth, to have any chance of their ever flowering in this country: but the flagelliform, or smaller creeping *cereus*, being more hardy, will succeed very well by green-house culture, and flower abundantly in its regular course: however, shall just intimate, that all the sorts are generally of the most free and durable growth in a hot-house, &c.

But, of the whole, the six-angled greater torch-thistle, and the flagelliform smaller creeping-*cereus*, are the most hardy or less tender, will succeed under the protection of a green-house in winter, with scarcely any

water, and in the open air from the middle or latter end of June till September, in dry, hot weather, then removed into the green-house.

Or may also inure some of the other torch-thistle kinds by degrees to the green-house, keeping them as dry as possible in winter, and at no time let them receive too much moisture, either by watering, or of excessive rains, when occasionally placed in the full air in summer.

They must all be planted in pots constantly to remain, and always in dry, light, sandy earth; have very little or no water in winter, especially those in a green-house, and but moderately watered in summer.

In the upright torch-thistle kinds some grow to a great height in America; and in this country, in our hot-houses, &c. they are often ten or twelve feet in stature; and if there was sufficient room above, they would apparently grow several feet higher; but when they reach the top glasses, we are obliged either to lay down the pots and plants together on their side horizontally, or otherwise to shorten their tops, in which case they throw out side-shoots, proceeding in an upright direction, like the main stem; and which, if taken off and planted, will readily emit roots and become proper plants.

The creeping-*cereus* kinds also extend themselves considerably in their climbing and trailing growth, which require support; and of which the two large sorts, the *grandiflorus* and *triangularis*, should be placed near the walls of the stove or hot-house, and their stalks trained thereto; they will branch out and advance in length, and root in the plaster work or joints of the wall as they ascend; and the flagelliform smaller creeping kind may have its trailing shoots trained up to sticks placed in the pots; or sometimes, when increased into many long stalks, are permitted to run in their natural growth, to hang down round the sides of the pot, in which they have a singularly curious appearance.

Most of the species both of the torch-thistle and creeping-*cereus* kinds produce flowers in this country, though not all of them annually, and some not in two, three, or more years, for they have no certain regular period of flowering here; and the flowers are rarely succeeded by fruit; but the small creeping-*cereus* generally flowers sooner, more frequent and abundant, than any of the other sorts in this class, and commonly regularly every year in its proper season, May, June, or July, delicately beautiful, though of all the sorts, the *grandiflorus*, night-flowering creeping-*cereus* is the most singularly grand and curious,

curious, during its very short continuance of only a few hours in full expansion.

No flowers, however, are, at any rate, to be expected in any of the sorts till the plants have obtained some degree of strength, according to their different growths; but generally attain a flowering state soonest, and flower more regularly at the respective seasons in the small creeping-cereus as before intimated.

All the sorts must be planted in pots of light, dry, sandy, rubbishy soil; for, as in their native climates, they grow mostly upon rocks and dry sandy parched situations, and being very succulent in their nature, if planted in rich moist earth, they would be apt to rot off in winter: therefore, generally prepare a compost of a sandy or light dry earth, some sea or drift-sand, or a portion of dry road soil of turnpike roads, and a little sifted lime-rubbish, the whole well blended together, and with which fill the pots, which should be of moderate size in proportion to the growth of their different species; generally small pots at first, and to set one plant in each pot.

Propagation of all the Sorts.

They are all propagated by cuttings of their stems and branches, in pots plunged in a bark-bed or other hot-bed, in May, June, or July.

When intended to propagate any of the upright sorts, supposing the plant to have only one stem and no side-shoots, there is no other method of increasing it than by cutting off the top to what length you please; and the cutting or part cut off, after lying in a dry place, about a fortnight, to heal the succulent wound, is to be planted in a pot of light compost, and plunged in the bark-bed, &c. and it will readily strike root and grow. The remaining part of the old plant, from which the above cutting was taken, will soon put forth lateral shoots, which, when from three to six or eight inches long, may be taken off, and planted singly in pots, as above directed, and the old plant continues to furnish a supply of fresh shoots annually.

The creeping kinds having several stalks and branches, may be propagated plentifully, by taking off cuttings of them from about three to five or six inches long, treating them as above.

Cuttings of all these plants will keep two or three months out of the earth, in a dry place, if necessary.

Third Class.

CACTUS OPUNTIA, the *Opuntia*, or Indian Fig, or Prickly Pear.

This class of Cactuses consists also of curi-

ous succulent exotics, mostly of American growth, which require the aid of green-houses and stoves in this country.

Class, order, and character, the same as the CACTUS *Melo-Cactus*.

The plants of this class are composed of a multitude of thick, fleshy, compressed, prickly leafless branches, growing out of one another in many oval and oblong divisions or joints, some compressed or flat, others cylindric-ventricose or bellied; some loosely disposed and spread near the ground, and some grow erect; all the sorts producing multipetalous concave flowers from the surface and upper-edge of the articulations, are succeeded by large, oblong, succulent, fig-shaped, prickly fruit, which in some of the sorts sometimes ripen in our gardens.

The plants in general are perennial in root, stem, and branches, have scarcely ever any leaves, and their succulent branches always assume a green colour.

The principal species of this class are,

1. CACTUS OPUNTIA *vulgaris*.

Common Opuntia, or Indian Fig.] Cactus Opuntia with low-spreading, loose, proliferous-jointed branches, of many ovate, compressed, fleshy joints, or divisions, growing loosely out of one another; armed with slender bristly spines, and yellow flowers at the edges of the branches, succeeded by oblong, prickly fruit; sometimes ripening in this country.

2. CACTUS OPUNTIA *Ficus Indica*.

Greater Common Indian Fig.] Cactus Opuntia with more erect, proliferous-jointed branches, composed of many ovate-oblong, compressed, fleshy-joints or divisions, growing out of one another, armed with long bristly spines in radiated clusters, and yellow flowers at the edges of the joints or branches, succeeded by larger, purple, prickly fruit.

3. CACTUS OPUNTIA *Tuna*.

(Tuna major)—or Great Indian Fig.] Cactus Opuntia with upright, strong, proliferous-jointed branches; composed of many large, ovate-oblong, fleshy-joints, or divisions, growing out of one another several feet high; armed with clusters of strong, awl-shaped spines; yellow flowers at the edges of the joints, and purple fruit.

Varieties.] Taller, larger, thick-branched, with long, black spines—largest, long, broad-jointed.

4. CACTUS OPUNTIA *cochenillifer*.

Cochineal-bearing Indian Fig.] Cactus Opuntia with strong, upright, proliferous-jointed branches, of many ovate-oblong, fleshy joints growing out of one another, five or six feet

feet high, almost smooth or spineless; and small red-purple flowers, succeeded by large succulent red fruit, having a soft blood-red pulp; on which feed the cochineal insects numerously, their bodies full of a similar deep-red tincture, very valuable for dying scarlet colour.

This species being a native of Mexico and the West-India islands, growing naturally, and also cultivated in large plantations, on which to obtain the above-mentioned cochineal insects, in more considerable abundance, which appearing numerously feeding on the inside of the opening fruit are then collected, and prepared for the European and other markets, under the appellation of cochineal, of great use to the dyers as the principal basis for scarlet colours, as before observed.

5. CACTUS OPUNTIA *curassavicus*.

Ventricose-branched Smaller Opuntia of Curassoa, or Pin-Pillow.] Cactus Opuntia with low-spreading proliferous-jointed branches, composed of many cylindric-ventricose or swelling divisions or joints, growing loosely out of one-another, and closely set with slender white spines.

This plant, from the form of its swelling joints, and numerous small spines, bearing a fancied resemblance to a pin-cushion stuck with pins, is called Pin-Pillow, in the West-Indies, where it grows naturally.

6. CACTUS OPUNTIA *spinosissimus*.

Most-Spinous Jamaica Opuntia.] Cactus Opuntia with an upright most prickly stem, and jointed narrow flat branches ranging two ways opposite, the whole closely armed with long slender spines crossing each other every way.

From the manner of its expanding growth, and being very closely covered with spines, this plant is sometimes humourously called Robinson Crusoe's Coat.

7. CACTUS OPUNTIA *Periskia*.

(Periskia) or Barbadoes Gooseberry.] Cactus Opuntia with a woody-like round prickly stem, slender spreading succulent branches, armed with tufts of long, double-recurved whitish spines, and lanceolate-ovate thick succulent leaves; whitish flowers, and roundish, soft, pulpy fruit.

8. CACTUS OPUNTIA *Phylanthus*.

Sword-blade Brazilian Opuntia.] Cactus Opuntia with proliferous, long, smooth, green, spineless, jointed branches, having thin flat joints shaped like a broad-sword, the edges waved-ferrated, and from which are produced many pale yellow flowers.

9. CACTUS OPUNTIA *moniliformis*.

Necklace-shaped South American Opuntia.] Cactus Opuntia with proliferous low-

growing jointed branches of many globular joints growing out of one another; resembling together the form of a bead necklace; the joints armed with awl-shaped spines.

10. CACTUS OPUNTIA *alatus*.

Narrow Long-Jointed Jamaica Opuntia.] Cactus Opuntia with proliferous, long, narrow, compressed, sword-shaped joints, decreasing to both ends, and the edges crenated; from whence proceed the flowers, succeeded by small compressed fruit.

These are the principal species of the Cactus Opuntia cultivated in the British gardens.

The first of these species, *Common Opuntia*, a native of North-America, is the hardiest of all the sorts, as it may be preserved in England by the shelter of a green-house or garden-frame in winter, and it will sometimes live all the year in the full ground under a warm wall; it is however proper to keep some in pots, to have shelter from frost.

All the other sorts being natives of South-America and the West-India islands, &c. are more tender, and should most generally be kept in a hot-house or stove most part of the year; for, although they will live in the full air two or three months in summer, and in a good green-house in winter, they, for want of a due temperature of warmth, are apt to assume a yellowish hue, and shrivelly, dwindling appearance; but when kept mostly in the stove, they always retain their respective natural green colour, and plumpness of growth; and are more prolific in their flowers and fruit: they, however, at any rate, must never be fully exposed, but only two or three months in the heat of summer, and but very little in wet seasons: or if any are wintered in a green-house, give very little or no water in that season, kept dry below and above, placed in the warmest, driest part of that conservatory, and have the protection thereof from the beginning or middle of September till the middle or latter end of June.

All the sorts should always be continued in pots of light sandy soil, or dry rubbishy compost, giving frequent light waterings in summer, and also now and then lightly in winter, especially those in the stove; but if in a green-house, must have scarcely any, or as moderately as possible in that season, as before observed.

Their Propagation.

They are propagated very easily by cuttings or joints of their branches, which may be taken off and planted in pots of light sandy compost any time from the beginning of May to the end of July, but the sooner the better.

The cuttings are to be cut off in joints, which, previous to planting, must, like other succulents,

succulents, be laid in a dry place ten or fifteen days, to heal over the cut part; then plant them in pots as above, and if the hot house kinds are then plunged in the bark-bed, or other hot-bed, it will greatly promote their rooting; but the green-house sort, Common Opuntia, will readily strike root without that aid, though they may be greatly forwarded by such assistance, giving all the sorts now and then moderate waterings, just to moisten the earth a little.

CALCEOLARIA, Slipper-Wort.

A genus of American herbaceous plants, retained in our stoves for the singularity of their flowers.

Class and order, *Diandria Monogynia*.

Characters.] CALYX, monophyllous, cut into four spreading parts, with laciniae, oval, and persisting. COROLLA, monopetalous, ringent, and inflated. STAMINA, two very short, within the upper lip, topped with incumbent antheræ. PISTILLUM, a roundish germen, short style, and blunt stigma. PERICARPIUM, a conic two-celled capsule, containing many oval seeds.

The species are,

1. CALCEOLARIA *pinnata*.

Wing-leaved Calceolaria.] Hath herbaceous annual stalks two feet high, pinnate leaves composed of three or four pair of lobes rounded at their extremities, and terminated with an odd one which is larger than the others; from the axilla of the leaves the flower arises; it has no beauty of colour to recommend it, but its singularity of its slipper-shaped form.

2. CALCEOLARIA *Fothergillii*.

Spatula-leaved Calceolaria.] This species differs very considerably from the former; the stalk very low, leaves opposite, petiolate, blunt, and their upper parts covered with down; the cup is acutely cut, with the top inflexed; the upper lip of the Corolla is roundish and kidney-shaped, erect, and of a yellow colour; the lower lip is inflated and spotted with red and yellow; the chaps are large, three-cornered oval; and the flowers are supported by round, hairy, long peduncles, coming out either singly or in pairs.

Propagation.

The first species being a tender annual, is to be sown in a common hot-bed in the spring, and when of proper size transplanted into the flower-garden among others of the same growth, where they will flower and ripen their seeds; but a few in pots should be retained in the stove where the flowers may be examined more conveniently, they not being of a large size; they may also be raised from cuttings at different times, which will continue their bloom most of the year.

The second species may be propagated in the same manner, but being a tender biennial, must be kept in the green-house during the winter, to flower the following summer.

CALENDULA, the Marigold.

This genus of plants consists of herbaceous bushy annuals, one low perennial, and one shrubby plant: the former comprises hardy culinary herbs and flowery plants; and the two latter ornamental plants for the green-house, all of which have simple leaves, and compound radiated flowers.

Class and order, *Syngnesia Polygamia Necessaria*.

Characters.] CALYX, a compound radiated flower, having a simple multipart general cup. COROLLA is compound, and consists of numerous tubular hermaphrodite florets in the disk, and many long flat females compose the rays. STAMINA, the hermaphrodites five short filaments and cylindric antheræ. PISTILLUM, the hermaphrodites an oblong germen; slender style, and blunt bifid stigma; the females a trigonous germen, slender style, and reflexed stigma. PERICARPIUM, none. SEMEN, a single, oblong, incurved seed, in the female florets.

The species of note are as follow: the three first species and varieties are hardy annuals of the full ground.

1. CALENDULA *officinalis*.

Officinal, or Common Garden Marigold.] Calendula with a short stalk, dividing low into many bushy branches a foot or two high, closely garnished with oblong-oval leaves, and numerous radiated golden flowers at the ends of the branches, succeeded by boat-shaped, incurved, rough seeds.

Varieties of this are,] Common Marigold with single yellow flowers—with double yellow flowers,—Giant Common Marigold with very double flowers—with single lemon-coloured flowers—double lemon-coloured flowers—with single and double gold-coloured flowers—with party-coloured flowers—with reflexed flowers—with proliferous or childing flowers, having many small flowers issuing from the calyx of the main one all around; of which there are, the Small Proliferous Marigold—Great Proliferous Marigold.

All these varieties are hardy annuals, rising from seed in the full ground in spring, commonly flower in May or June, continuing a plentiful succession until November, succeeded by abundance of seed, which, if gathered with care from the best of each respective sort, may all be continued in distinct perfection; this should be particularly observed in the

Giant

Giant and other fine double and Proliferous kinds.

2. *CALENDULA pluvialis.*

Leafy-stalked Small Cape Marigold.] *Calendula* with slender, very leafy, declining stalks, six or eight inches long; spear-shaped, sinuated-indent leaves; and marigold-shaped flowers from the ends of the branches, having the rays violet-coloured without, and white within, and purple bottoms.

3. *CALENDULA nudicaulis.*

Naked-stalked Small Cape Marigold.] *Calendula* with a simple, slender, naked or almost leafless stem, six or eight inches long; leaves below lanceolate, sinuate-indent; and at the upper part of the stem smaller marigold-shaped flowers singly, having a purple bottom, the ray violet-coloured on the outside, and white within.

4. *CALENDULA hybrida.*

Hybrid or Mongrel, greater Cape Marigold.] *Calendula* with a thicker, longer, leafy stem, spear-shaped indent leaves, and peduncles thickened at top, terminated each by a larger marigold-shaped, purple, violet and white flower.

The two following are green-house perennials.

5. *CALENDULA graminifolia.*

Grass-leaved Perennial Cape Calendula.] *Calendula* with several tufted heads near the root, covered with long, narrow, grassy leaves, and amongst them naked stalks eight or nine inches long, each crowned by one large radiated flower, having the rays purple without, white within, and purple bottoms, appearing from April till Autumn.

6. *CALENDULA fruticosa.*

Shrubby Cape Calendula.] *Calendula* with shrubby slender stalks and branches, growing six or seven feet high, garnished with oval leaves, and the branches terminated by radiated flowers, having the radius purple without, white within, and purple middles, appearing several months in summer.

The flowers of all the sorts, in their common single state, display a naked disc or middle, composed of numerous, very small, tubular florets; one or two series of flat spreading ones form the radius, ray, or border; but in the full double flowers, the plenitude consists of numerous flat florets, continued in many series from the circumference to the very centre, forming a large full flower.

The first sort, *Calendula officinalis*, in its common single-flowered state, is regarded only as a medicinal and pot-herb, and its flowers are the only parts used; but some of the full double varieties and proliferous kinds

demand attention also as ornamental plants for the beauty of their flowers, which will effect an agreeable diversity in the common compartments of the pleasure-ground, in assemblage with other hardy annuals.

Likewise the second, third, and fourth sorts, being hardy annuals, will flower abundantly, and form a good variety in the open borders in June, July, and August.

The fourth and fifth sorts, Grass-leaved and Shrubby-*Calendula*, producing many flowers in long succession, are also worthy of a place in our gardens; but being impatient of frost, must be kept in pots, to have shelter of a green-house or frame in winter.

Propagation of all the Sorts.

All the annual sorts are propagated by sowing the seeds in beds or borders in March or April, either in the places where they are to remain, or for transplanting.

When intended to cultivate the first sort for culinary uses, may either sow the seeds where the plants are to remain, by broad-cast on the surface, and rake them in, or sow them in small shallow drills a foot asunder, covering them half an inch deep; and when the plants in either method have leaves an inch broad, hoe them out to twelve inches distance; or they may be sown thick for transplantation, and when the plants have four or five leaves, plant them out in rows the above distance.

Their flowers being the useful parts, they will be produced in constant succession all summer, to gather from time to time in dry weather, and, after drying them in the shade, should be put up in paper bags for use.

To propagate the annual kinds in general as flowering plants, sow them either in patches in the borders, &c. where they are to remain, sowing four or five seeds in each patch half an inch deep, but leave only one of the best of the plants in a place; or the plants may be raised in a bed or border, and when they have four or five leaves, transplant them in the order just directed.

They will flower and ripen seeds abundantly from June to the end of October.

The fourth sort is propagated by slipping the heads at any time from March till September, planting them in pots, which, if plunged in a hot-bed, or in the common earth, and close covered with a hand-glass, and occasionally shaded and watered, they will readily grow, hardening them gradually to the air.

The shrubby sort is propagated by cuttings of its branches, in pots of light earth, in April, May, or June, plunging them in a moderate hot-bed, or, in default thereof, plunge

plunge them to the riths in the common ground, giving shade and water.

CALYX, the empalement or flower-cup, which is the green outer part of a flower, that immediately incloses and supports the bottom of the corolla or petals. See **COROLLA**.

According to modern botanists, there are seven species of Calyx, viz.

1. *Perianthium*, which is the most common species of flower-cup, and is that sort of Calyx which closely surrounds the flower. When we speak therefore of the proportion, figure, or singularity of the Calyx, we would be understood to mean that species of Calyx called *Perianthium* (See **PERIANTHIUM**). The other sorts of Calyx, which differ remarkably both in appearance and structure from this, are always denominated by their own proper names to avoid confusion, and which are termed,

2. *Involucrum* is a Calyx at a distance from the flower, and belongs principally to the umbelliferous plants. See **INVOLUCRUM**.

3. *Amentum*, or Katkin, is composed of a multitude of small scales, fastened to an axis or thread. See **AMENTUM**.

4. *Spatha*, a sheath, which bursts lengthways, and protrudes one or more flowers, as in the Narcissus, &c. See **SPATHA**.

5. *Gluma*, the husky Calyx of the grasses. See **GLUMA**.

6. *Calyptra*, the minute, supposed Calyx of the mosses, is membranous, very thin, and shaped like an extinguisher, and is placed over the antheræ. See **CALYPTRA**.

7. *Volva*, the Calyx of the *fungi*, or mushroom tribe is membranous, and torn on the sides. See **VOLVA**.

The use of the Calyx is to inclose, secure, and support the other parts of the flower; to be their security before its opening, by intercepting all extremities of weather, and afterwards to be their support, by containing all the parts in their due and most graceful posture. Hence we have the reason why the Calyx is frequently various, and sometimes wanting. Some flowers have none, as tulips, and many other liliaceous plants; because having a fat, firm leaf or petal, and each leaf likewise standing on a broad and firm basis, they are thus sufficient in themselves. Carnations, on the contrary, have not only a Calyx, but for greater support, it is long, and of one piece; for otherwise, the foot of the petals being very long and slender, most of them would break out of compass; in the same flower the top of the Calyx is indented into five parts, that the indentments, by lapping over the petals before their expansion,

protects them; and afterwards the same parts, by spreading regularly under the Corolla when expanded, afford it support. The Calyx or cup in most plants is single; in some genera of the mallow tribe, as *alcea*, the holyhock, and *Althæa*, marsh-mallow, it is double, or of two series.

With respect to the number of leaves or pieces of which the Calyx is composed, it is either of one leaf, *monophyllus*; or of two, *diphyllus*; of three, *triphyllus*; of four, *tetraphyllus*; of five, *pentaphyllus*, &c. or many leaves, *polyphyllus*; and when one leaf is divided into two, three, four, five, or more parts, it is termed *monophyllus bifidus*, *trifidus*, *tetrafidus*, *quinquefidus*, &c. which leaves and divisions are either equal, as in most plants; or unequal, as in rock-rose, &c. in which, two of the five leaves of which the Calyx consists, are alternately less than the other three.

With respect to proportion, the Calyx is generally shorter than the corolla in most plants, though in some genera it is equal, and in some longer.

With respect to composition, the Calyx sometimes consists of a number of leaves laid over each other like tiles or scales, *imbricatum*, as in hawk-weed, &c. sometimes of scales that spread wide and are diffused, or diverge on all sides, *squamosus*, as in the thistle.

As to duration, the Calyx either falls off at the first opening of the flower, *Calyx caducus*, as in the poppy. With the flower, *Calyx deciduus*, as in the berberry and the cross-shaped flowers; or continues till the maturity of the fruit. *Calyx persistens*, as in the lip and masqued flowers, and several others.

Lastly, a Calyx is proper to one flower, as in most plants with simple flowers; or common to many, as in scabious and the compound flowers.

CALLA, *Æthiopian Arum*.

Of this genus is one beautiful, herbaceous, flowery perennial of the green-house, adorned with large radical leaves, and a two-foot stalk, crowned by spadiceous yellowish flowers.

Class and order, *Gynandria Polyandria*.

Characters.] **CALYX**, a monophyllous, oval, heart-shaped, coloured, permanent spathe, protruding a finger-shaped, single, erect club or spadix, covered with the fructifications. **COROLLA**, no petals. **STAMINA**, many very short filaments, and small yellow antheræ. **PISTILLUM**, a roundish germen, simple style, and acute stigma. **PERICARPIUM**, each germen becomes a globular, pulpy, unilocular berry, containing a few obtuse seeds.

The species is,

CALLA *Æthiopica*.

Æthiopian Arum, or Sweet Calla.] *Calla* with a tuberous, thick, fleshy, brown root, crowned by clusters of large heart-shaped, arrow-pointed leaves, on very long foot-stalks; and amongst them upright flower-stalks two feet high, terminated by a single spathe, protruding a yellowish spadix covered with whitish fructifications of a musky fragrance, succeeded by roundish red berries.

It is furnished with leaves all the year, flowers in May, and the whole plant effects an agreeable singularity.

This species being an exotic of Africa, requires shelter here in winter, so must be continued in pots of light earth, to be moved to a green-house or garden-frame in that season, but should be placed in the full air from May till October.

It propagates exceedingly by off-sets, which may be separated in September, planted singly in small pots, and they will flower the year following.

CALTHA, Marsh Marygold.

One species only belongs to this genus, a hardy, low, herbaceous, flowery perennial of but six or eight inches stature, producing many showy yellow flowers.

Class and order, *Polyandria Polygynia*.

Characters.] **CALYX**, none. **COROLLA**, five large, spreading, concave petals. **STAMINA**, numerous filaments, and obtuse erect antheræ. **PISTILLUM**, several oblong compressed germina, no styles, but simple stigmas. **PERICARPIUM**, several short acuminate capsules, containing many roundish seeds.

The species is,

CALTHA *palustris*.

Marsh Marygold.] *Caltha* with fibrous perennial roots, crowned by many round crenated leaves on short foot-stalks, and amongst them several branching flower-stalks six or eight inches high, surmounted by large bright yellow flowers, in April, May, and June.

Varieties.] Common Single-flowered Marsh Marygold—Double Marsh Marygold.

The single kinds have but five petals, but the doubles are multiplied to the very centre, forming a large, fair, full flower.

This species, in its single state, ornaments our moist meadows, and places contiguous to brooks, rivers, or other waters, in many parts in great abundance, among which the double was found, and which merits a place among our hardy flowering perennials in the embellishment of shady borders, though it will prosper in any situation.

Its propagation is easily and abundantly effected by slipping or parting the roots in

autumn, and each slip will flower the following year.

CALLICARPA (*Callicarpa*) or Johnsonia.

A curious deciduous flowering shrub of moderate growth, for principal shrubbery compartments.

Class and order, *Tetrandria Monogynia*.

Characters.] **CALYX**, a monophyllous bell-shaped cup, with the border cut into four erect segments. **COROLLA**, monopetalous and tubulous, with the limb cut into four obtuse spreading parts. **STAMINA**, four slender filaments double the length of the corolla, topped with oval, incumbent antheræ. **PISTILLUM**, a roundish germen, slender style, crowned with an obtuse stigma. **PERICARPIUM**, a smooth globose berry containing four hard, oblong seeds.

Only one species is known in the British Garden, viz.

CALLICARPA *americana*.

American Callicarpa, or Johnsonia.] *Callicarpa* with a shrubby very branchy stem divided into many branches growing three or four to five or six feet high: garnished with roundish oblong serrated acute leaves, hoary underneath; and numerous small funnel-form, four-parted, reddish flowers in axillary panicles, succeeded by small globose beautiful red-purple berries, in America, rarely in this country.

This is a moderately hardy exotic shrub of North-America, &c. where, and in the West and East Indies, are several other species of less note, rarely cultivated in these parts, so that the above is the only one I believe as yet generally known in our gardens, in which it has been long cultivated as a flowering-shrub to adorn shrubberies, &c. in assemblage with others, where it should generally be allotted a somewhat sheltered warm situation, especially when young: and should also retain some in pots, in order for removing to a green-house or garden-frame in severe weather in winter. It is propagated by seeds imported from America, also by layers and cuttings of the young shoots: all generally performed in the spring; or the layers and cuttings also in the early part of summer: and the whole would be much facilitated by the aid of a moderate hot-bed or bark-bed.

CALYCANTHUS, Carolinian All-Spice tree.

This genus furnishes a hardy, deciduous, aromatic shrub, for the shrubbery plantations.

Class and order, *Icosandria Polygynia*.

Characters.] **CALYX** is monophyllous, cut into many spear-shaped coloured folioles. **COROLLA**, none; the calycinal folioles supply the place of petals. **STAMINA**, many fila-

ments, and oblong fulcated antheræ. PISTILLUM, numerous germina, and naked stigmas. PERICARPIUM none; the calyx thickens to an oval fruit, containing many seeds.

The species is,

CALYCANTHUS floridus.

Florid Carolina All-Spice tree.] Calycanthus with a shrubby brown stem, branching four or five feet high, having an aromatic bark; large oval, pointed leaves, by pairs opposite; and dull-purple starry flowers, placed singly towards the ends of the branches, having the inner petals the longest.

Varieties.] Long-leaved Carolina All-spice—Round-ovate-leaved.

In America it has the appellation of All-spice, from the aromatic spicy odour of its bark.

This shrub should have a warm situation and dry soil, in the fronts of the principal shrubbery compartments. And its propagation is by layers of the young branches, or one year's shoots, which in one year will be rooted fit for transplantation.

CALYCULA, the Calyx of a floret in an aggregate flower.

CALYCVLATUS Calyx, an augmented Calyx, or a flower-cup furnished with a lesser flower-cup, or small leaves placed close to the base of the cup, or to the flower.

CALYPTRA, the Calyx of the mosses. See CALYX.

CAMELLIA, *Japan Rose*.

Consists of a large, evergreen exotic for the green-house collection, garnished with shining leaves and rosaceous flowers.

Class and order, *Monadelphia Polyandria*.

Characters.] CALYX, several roundish imbricated leaves, the interior ones largest. COROLLA, five or seven ovate petals, joining at their base. STAMINA, many erect filaments, joining below, and spreading loose above, with simple antheræ. PISTILLUM, a roundish germen, subulate style the length of the stamina, and crowned with three acute stigmas. PERICARPIUM, a woody, top-shaped capsule, containing a roundish nucleus, with cells sometimes filled with lesser seeds.

The species is,

CAMELLIA japonica.

Japan Rose.] Hath a tree-like stem, branching upwards twenty feet high, and garnished with evergreen, oval, serrated, pointed leaves, about two inches wide and four long, placed alternately; the flowers which come out from the sides of the branches are large, spreading, and rosaceous; these are succeeded by a woody capsule, containing a kind of nut.

Varieties.] Camellia with single red flow-

ers—with single white flowers—with double red flowers—with double white flowers.

This fine tree, in its native country, becomes very tall and large, and much esteemed by the natives for its fine evergreen leaves and beautiful blossoms; but though it is retained here as a green-house plant, there is no doubt, if trained to a south wall, and protected from severe frost, there will be but little danger of its being destroyed in winter, where it will exhibit a profusion of its charming flowers in succession all the spring. This plant has great affinity to the tea-tree.

It is most commonly propagated by layers in May; cuttings may also be tried of the young shoots, with the assistance of a moderate hot-bed.

CAMPANIFORMES *Plantæ*, plants that produce Campanulate, or bell-shaped flowers, such as the *campanula*, or bell-flower, *trachelium* or throat-wort, *convolvulus*, *lobelia*, or cardinal flower, *asclepias*, *atropa*, *bryonia*, *tamus*, *apocynum*, *hibiscus*, or *althæa frutex*, &c.

CAMPANULA, Bell-flower.

This genus furnishes a beautiful collection of herbaceous, annual, biennial, and perennial flower-plants; the perennials are much the most numerous, and grow from about two to seven feet high, garnished with simple leaves, and numerous monopetalous; very conspicuous, bell-shaped, blue, purple, and white flowers.

Class and order, *Pentandria Monogynia*.

Characters.] CALYX, a monophyllous, five-parted cup placed on the germen. COROLLA, a single bell-shaped petal, five-parted at top, and in the bottom, a five-parted nectarium. STAMINA, five short filaments inserted into the top of the valves of the nectarium, and oblong compressed antheræ. PISTILLUM, an angular germen below the receptacle, slender style, and tripartite stigma. PERICARPIUM, a roundish, angular capsule of three or five cells, and the same number of holes for the dispersion of the seeds.

The species of most note are the following, of which the first five are hardy perennials.

1. *CAMPANULA pyramidalis.*

Pyramidal, or Steeple Bell-flower.] Campanula, with large, tuberous, milky roots, upright, strong, smooth stalks, a yard or more high, garnished with oblong-oval slightly-serrated, smooth leaves, decreasing in size upward, and numerous, large, bell-shaped flowers, forming a pyramid from the middle to the top of the stalk.

Varieties.] Pyramidal blue-flowered Campanula

panula—with white flowers—with double flowers.

2. *CAMPANULA persicifolia*.

Peach-leaved Campanula.] Campanula with very fibry roots, crowned by numerous ob-oval leaves; many upright, angular stalks, two feet and a half high, garnished with long, narrow spear-shaped, stiff, close-fitting leaves, and towards the top many large, bell-shaped, expanded flowers in June and July.

Varieties of this are,] Peach-leaved, single, blue flowered Campanula—with double blue flowers—with single white flowers—double white flowers.

3. *CAMPANULA Trachelium*.

(Trachelium majus)—Great Throat-wort, or Nettle-leaved Campanula.] Campanula with fibry roots, upright, angular, hairy stalks, two or three feet high, emitting short side branches, ornamented with ovate-oblong, cordate, deeply sawed, foot-stalked, hairy leaves; and towards the top, trifid foot-stalks supporting spreading bell-shaped flowers having hairy cups, appearing in June.

Varieties of this are,] Great Throat-wort with single blue flowers—double blue flowers—single white flowers—double white flowers—single and double pale purple flowers.

4. *CAMPANULA latifolia*.

Broad-leaved Great Campanula, or Giant Throat-wort.] Campanula with thick, fleshy, milky roots, upright, strong, round, unbranching stalks, six or seven feet high, garnished with broad, oval-spear-shaped, serrated, alternate leaves, and the upper part with bell-shaped, deeply cut, spreading flowers growing singly on short foot-stalks.

Varieties.] Broad-leaved great Campanula with single blue flowers—double blue flowers—single and double white flowers—single and double pale-red flowers—with striped flowers.

5. *CAMPANULA grandiflora*.

Great Flowered Campanula.] Campanula with fibrous roots, upright stalks a foot high, garnished with oblong, serrated, alternate leaves, and the upper part with one or two very large blue bell-shaped flowers, spreading three inches at the brim, which, before opening, somewhat resemble an air balloon, whence called by some the balloon plant.

6. *CAMPANULA carpatica*.

Carpathian Alpine Bellflower.] Campanula with low, slender stalks and weak branches, heart-shaped, serrated, smooth leaves, and the branches bearing one large blue flower, continuing in succession great part of the summer.

The following is a hardy biennial:

7. *CAMPANULA Medium*.

(Medium)—Smaller Pyramidal Campanula, commonly called Canterbury Bells.] Campanula with thick fibry roots, crowned by many oblong, rough, hairy leaves, an upright, robust, furrowed, pyramidally branching stalk, two feet high, garnished with long, narrow, sawed, hairy leaves, placed alternate, and numerous large bell-shaped, ventricose flowers, on long foot-stalks, arising pyramidally almost the whole length of the stalk, appearing in June or July, succeeded by quinquelocular capsules.

Varieties.] Canterbury Bell-flower with blue flowers—purple flowers—white flowers—with striped flowers—with double flowers: the two latter of which are rare.

The two following are hardy annuals.

8. *CAMPANULA Speculum*.

(Speculum Veneris)—or, Venus Looking-glass.] Campanula with a very branching, diffused, angular stalk, about a foot high, ornamented with small oval-oblong, close-fitting leaves, and all the numerous branches terminated each by one small, bell-shaped, five-parted flower, in long solitary cups, succeeded by prismatic capsules—flowering most part of summer and autumn.

Varieties.] Venus' Looking-Glass with bright blue flowers—with white flowers—pale purple flowers.

9. *CAMPANULA hybrida*.

Mule, or Small Venus Looking-glass.] Campanula with a low stalk, eight or ten inches high, branching from the bottom, garnished with small, oblong, crenated, close-fitting leaves, and all the branches terminated by small bell-shaped, five-parted flowers, in aggregate cups, succeeded by prismatic capsules—flowering in June and July.

The following is a green-house perennial.

10. *CAMPANULA americana*.

American Bell-flower.] Campanula with a thick fleshy root, crowned by a clustered head of oblong, crenated, rigid leaves, an upright branching stalk a foot and a half high, adorned with heart and spear-shaped membranous bordered leaves, having ciliated foot-stalks; and from the axillas many long pedunculi, each terminated by a large, bell-shaped, five-parted, spreading flower, in July and August.

Varieties.] American Bell-flower with single white flowers—single blue—double blue.

11. *CAMPANULA Rapunculus*.

(Rapunculus Esculentus)—Eatable Rapunculus or Rampions.] Campanula with a fleshy, spindle-shaped, biennial, eatable root, crowned with spear-shaped-oval leaves, an upright branchy

branchy stalk, half a yard to two feet high, garnished with waved, pointed leaves, and contracted panicles of upright, bluish-purple flowers.

This sort is sometimes cultivated for its fleshy eatable root, both to boil and to eat raw, sliced in sallads, &c. and to boil and serve to table with butter in the manner of asparagus; and salsafy—but is not at present in much esteem.

The flowers of all the species and respective varieties consist of one large bell-shaped petal, which in different species is more or less five-parted and spreading, and which in most of the sorts is succeeded by plenty of seeds in our gardens.

The first six species are hardy, very beautiful, flowery perennials; they are perennial only in root, which is of many years' duration, crowned with numerous leaves, and amongst them rise the flower-stalks annually in spring, flowering chiefly in June, July, and August, succeeded by abundance of seed, and soon after die down to the root; they producing numerous flowers in long succession, renders them choice furniture for the pleasure-ground, and they grow freely in the common borders, or other compartments, in any exposure. The first sort, however, being somewhat impatient of wet and very severe frost, should have a dry soil and sheltered situation; and some should also be placed in pots, to be moved to occasional shelter in severe weather; and in summer, when in flower, they may be moved in their pots to adorn any particular part, for they are very flowery and ornamental; and if their stalks are trained to sticks, fan-fashion, they will appear to considerable advantage, and in which order they are often placed to adorn halls and other apartments in summer, placing them against the chimnies, or where required, they will continue a long time ornamental.

The seventh sort (*Campanula Medium*) and varieties are most elegant biennials, and fine furniture for any part of the pleasure-ground; but, as being biennials, never flower but once, they rising from seed one year, the next they shoot up stalks, produce flowers, and perfect seeds, and soon after totally perish; so that a supply must be annually raised from seed.

The two annual sorts are proper furniture to adorn the fronts of borders, on the sides of spacious walks, in patches, among other hardy annuals. See ANNUAL PLANTS.

The roots of the American green-house kind are perennial, but the leaves and stalks are renewed annually, and flower freely, but rarely afford seeds in England; it must be

kept in pots of light earth, and moved to the shelter of a green-house in winter.

Propagation of all the Sorts.

The first six species and varieties are propagated plentifully by slipping or parting their roots in September, October, or early in spring. They may be also raised abundantly by seed, in a bed or border of common earth in March, sowing it on the surface, and rake it in; and the plants should be pricked out in July, which in October or November transplant into the borders, where they will flower the following summer. But as there seldom rise any but single flowers from seeds, the double kinds therefore are increased with certainty no other way than by dividing the roots, every off-set or slip of which, having fibres, will readily grow; but it is not proper to part them too small, unless when intended to have as great an increase as possible, in which case the small slips should be planted in nursery-beds a year to get strength; but the large slips may be planted at once, where they are to remain to flower.

But it is proper to observe of the first sort (*Pyramidal Campanula*), that the roots do not multiply so fast as the others, nor are they of so long duration; it is therefore necessary to raise a supply of them often from seed, and seedling-plants generally flower strongest. Let seeds therefore be sown in autumn, or early in spring, in large pots, boxes, or tubs of light rich compost, covering the seed half an inch deep, and place them in a frame to have occasional shelter of glasses in very cold, wet, or severe frosty weather, but fully expose them in mild days. By this care the plants will appear in April or May, and by September will be of due size to transplant, doing it when their leaves decay, planting them in a high-lying bed or border of light earth, at six inches distance, with their crowns half an inch deep. Here let them remain two years, giving occasional shelter in winter, and weeding and water in summer; then in autumn finally transplant them, some into pots, others close under a warm wall, and some disperse in open dry borders among other perennials.

The fifth sort (Canterbury-bell) and varieties, being biennials, can only be raised from seed, sown annually in March, April, or May: sow it in a bed or border of good earth by broad cast, and rake it in, and the plants will be fit to prick out in June or July, planting them six inches apart, to remain till autumn or spring following: then transplant them, with little balls of earth to their roots, in the places where they are to flower.

The

The two annual sorts are also raised from seed, sowing it a quarter of an inch deep, in small patches, in different parts of the borders, in the place where they are to flower, permitting several plants to remain in each patch.

The American sort is propagated by off-sets from the roots of the old plants in September.

The tenth sort, Rampion, considered as an esculent, for its eatable root, is raised from seed sown the latter end of April, or in May, in a moist situation or any shady border; and the plants thinned, to four or five inches distance, and the roots will increase in growth till September or October, when, and during the winter, they may be dug up for use as wanted.

They will continue good till next spring, then shoot up to stalks, and become useless; so that a fresh supply must be raised annually from seed as above.

CANARINA, Canary bell-flower, an exotic perennial for the green-house.

Class and order, *Hexandria Monogynia*.

Characters.] CALYX, a monophyllous cup divided into six lanceolate recurved segments. COROLLA, monopetalous, bell-shaped, six-parted at top, and in the bottom a nectarium of six equal valves. STAMINA, six subulate filaments inserted into the top of the valves of the nectarium, and pendulous antheræ. PISTILLUM, an hexagonal germen below the receptacle, short conic style, and crowned with six stigmata. PERICARPIUM, a six-angled obtuse capsule with six cells, containing many small seeds.

There is but one species, viz.

CANARINA *campanulata*.

Canary bell-flower.] Canarina with thick fleshy roots, upright round stalks, seven feet high, sending out many side branches, garnished with spear-shaped leaves, placed opposite; and from the joints large bell-shaped flame-coloured, reddish-striped flowers, hanging downward, succeeded by six-celled capsules, flowering in September and October, often continuing till spring.

This is a beautiful plant when in flower, the root is durable, the leaves and stalks are renewed annually, but the flowers rarely afford us seeds in England; it must be kept in pots of light earth, and sheltered in the green-house in winter. It is propagated by off-sets of the roots in July, when the stalks are decayed, but this must be done with caution not to break the root, as being replete with a flowing milky juice, and they should be laid to dry a few days before planting.

CANELLA.

It is of the tree kind, a native of South Ame-

rica, requiring the indulgence of a stove in this country, where it is cultivated for variety, having oblong leaves, and pentapetalous flowers.

Class and order, *Dodecandria Monogynia*.

Characters.] CALYX is bell-shaped, trilobed, with the lobes roundish and concave. COROLLA, five oblong, sessile petals, longer than the calyx, and a conical pitcher-shaped nectarium. STAMINA, no filaments, but twelve or sixteen linear, distant antheræ, affixed to the outside of the nectarium. PISTILLUM, an oval germen, cylindric style, with three obtuse stigmas. PERICARPIUM, a round trilocular berry, with two heart-shaped seeds.

There is but one species, which is wholly a fine aromatic.

CANELLA *alba*.

White Laurel-leaved Canella, or White Cinnamon.] Rises with a thick woody stem, branching on every side, almost the whole length, growing near twenty feet high, having a lightish coloured aromatic bark, oblong, obtuse, light green leaves, and red flowers, in umbellate clusters, at the ends of the branches succeeded by roundish berries.

This tree being a native of the hot parts of America, must always be kept in the stove in this country, and plunged mostly in the bark-bed.

It is propagated by seeds and cuttings in pots, plunged in the bark-bed, also by layers, though the seeds are generally the most certain in increasing them, which are procured from America by the seedsmen, for the cuttings and layers root reluctantly.

CANNA, Indian flowering Reed, or Indian Shot, so called from the figure of their black seeds.

The plants are herbaceous perennials of America, preserved here in hot-houses for the beauty of their monopetalous flowers, produced in spikes upon stalks, from about a yard to six or seven feet high.

Class and order, *Monandria Monogynia*.

Characters.] CALYX, a three-leaved coloured abiding cup. COROLLA, one petal cut into six spear-shaped segments, and a two-parted nectarium. STAMINA, no filaments, but a linear anthera, attached to one segment of the nectarium. PISTILLUM, a roundish germen under the calyx, a flat style, and linear stigma. PERICARPIUM, a roundish, three-furrowed, trilocular capsule, containing globular seeds.

The species are,

1. CANNA *Indica*.

Common Indian Flowering Reed.] Canna with

with a tuberous, thick, fleshy root, crowned by many large, oval, ribbed leaves, a foot long, almost half as broad, pointed at both ends, and an upright herbaceous stalk four feet high, terminated by loose spikes of flowers, of different colours in different varieties.

Varieties are,] Common Indian Flowering Reed with scarlet flowers—red flowering—yellow flowering—and with spotted flowers.

2. *CANNA Glauca.*

Sea-green-leaved Canna.] Canna with tuberous, knotty, fleshy roots, upright stalks seven feet high, leaves sea-green, a foot and a half long, and the stalk terminated by thick spikes of large, pale-yellow flowers.

These plants make a good appearance when in flower, which in England is in June, July, and August, succeeded by seeds in autumn. The plants must always be kept in pots of rich earth, to be moved to shelter in winter.

They are propagated by seeds in a hot-bed in spring; and in summer, when the plants are a little advanced in growth, prick them separately in small pots of rich earth, plunging them also in the hot-bed, giving shade, water, and fresh air, to which harden them by degrees till they bear it fully till October, then place them in a stove or very good greenhouse.

CANNABIS, the Hemp Plant.

There is but one species, an herbaceous, tall, strong annual, valuable for the peculiar property of its stalk for making hemp for cordage and coarse cloth, and its seed for oil, &c.

Class and order, Diœcia Pentandria.

Characters.] **CALYX**, male and female flowers on different plants, the males having a five-parted cup; that of the females is monophyllous, oblong-pointed, and permanent. **COROLLA**, no petals. **STAMINA**, the males have five filaments, and square antheræ. **PISTILLUM**, in the females, a small germen, two long styles, and acute stigmas. **PERICARPUM**, a very small, bivalve nut, with the seed lodged in the calyx.

The species is,

CANNABIS sativa.

Cultivated or Common Hemp.] Cannabis with an upright, strong, branchy stalk, six or seven feet high, or more, adorned with large finely-digitated leaves, of about seven long narrow lobes, and male flowers in terminal pendulous spikes; females, solitary at the axillas.

Varieties.] Manured Hemp with male flowers—with female flowers, or female hemp.

Both the varieties are alike useful, as hemp for cordage, &c. but it is the female sort only,

that produces the seed, for oil and other uses.

A few of these plants may be admitted as annuals in the pleasure-ground, for the variety of their majestic growth and numerous fingered leaves, sowing the seed in April where the plants are designed to remain.

In the husbandry culture of this plant, it delights in a moist, rich, deep soil, prepared for the seed, by ploughing and harrowing; and April is the time for sowing, allowing two bushels to an acre, sowing it by broadcast and harrow it in; and when the plants are come, hoe them to a foot distance, and they will be fit to pull for use in autumn.

It is pulled at two different times, the male plants generally about the middle of August, or when they have shed their farina to fecundate the females, soon after which they begin to decay, the leaves changing yellowish, and the stalks white, tokens of mature growth, and should be pulled; but the females must stand till October to ripen their seed. Both sorts, when pulled, are bound in bundles half a yard in compass, and after drying a few days, are then carried to some river, brook, or other water, in which the bundles are placed upon one another, and kept under by some weight at top; then remain several days, and afterwards spread to dry, four or five weeks: and being thus prepared to a proper state for breaking, in order for separating or dividing the hard husky substance, and forming the towy fibrous or useful parts, the whole is tied in bundles again and housed, ready for breaking, as aforesaid, hackling and manufacturing into that valuable material commonly called Hemp; the great and universal utility of which is well known; being of vast importance for making all sorts of cordage, and particularly valuable in shipping, for the various sorts of cordage, cables, sails, &c. and likewise for making variety of very useful coarse cloths for domestic uses on many occasions.

The Hemp plants when cultivated for the seed, which is produced only in the females, must be permitted to continue in growth till it is fully ripe, about Michaelmas, then pulled and tied in bundles, dried, and the seed either threshed out directly, or housed till another opportunity; and when threshed, is then prepared for manufacturing, as above.

CAPITULUM, a little roundish head of flowers, a mode of inflorescence, or way of flowering, in which many small flowers or florets are collected into a close roundish head or knob, appearing as one flower, as in *gompheura*, or globe amaranthus; and *cephalanthus*, or button-tree.

A Capi-

A *Capitulum* is either,

Globofum, round or globular, as in *gomphrena globosa*; *dimidiatum*, half globular or hemispherical; *subrotundum*, roundish; *ovatum*, egg-shaped; *pyramidatum*, pyramidal-shaped; *pedunculatum*, the florets having little foot-stalks; *foliosum*, leafy, or intermixed with leaves; *nudum*, naked, having no leaves; *hispidum*, hispid, bristly.

CAPPARIS, the Caper Shrub.

There are several species, mostly of shrubby growth; and tender exotics of distant hot countries; one of which, a native of Italy and other southern parts of Europe, is cultivated in many of our gardens as a green-house or stove plant, and which is the true Caper-Shrub, the flower-buds of which pickled, are the Capers used in sauces, &c.

Class and order, *Polyandria Monogynia*.

Characters.] CALYX, the cup is cut into four concave gibbous parts. COROLLA, four large, obtuse, spreading petals. STAMINA, numerous filaments, and versatile antheræ. PISTILLUM, a pedicillated germen, no style, but an obtuse sessile stigma. PERICARPIUM, a fleshy, pedicillated, unilocular berry, and numerous seeds.

The true caper is,

CAPPARIS *spinofus*.

Pricky Capparis, or True Caper-Shrub.] Capparis with shrubby spinous stalks and branches, forming a bushy head, growing three or four feet high, garnished with roundish, smooth, entire leaves, placed alternate; and from the sides of the branches many single foot-stalks, each sustaining one large, expanded, white flower.

The flower-buds, before the petals begin to expand, are proper for Capers; but for which use these are not to be expected in due quantity in this country.

This plant must be kept in pots of light sandy earth, to be placed in a green-house in winter; but it is generally more prolific in flowers, when in a hot-house during that season.

It is propagated by seed from abroad, and by layers of its youngest branches: sow the seeds in pots of light sandy compost in spring, and plunge them in a hot-bed. By layers, the young branches may be layed in spring or summer, giving each a small slit, and they will probably be rooted in a year, though they are often two before it is effected.

CAPSICUM, *Capficum*, or Guinea Pepper.

This genus furnishes ornamental and useful plants, consisting of herbaceous tender annuals, and shrubby hot-house perennials, all of upright growth, with branchy heads, from two to five feet high, garnished with

simple leaves, and small wheel-shaped, five-parted, white flowers, succeeded by elegant scarlet, or yellow fruit; in which consists the principal merit of the plants, being beautiful when growing, and are an excellent pickle, of a hot spicy nature.

Class and order, *Pentandria Monogynia*.

Characters.] CALYX, a monophyllous cup, divided into five erect permanent segments. COROLLA, a small wheel-shaped acutely-five-parted, patent petal. STAMINA, five filaments, and connivent antheræ. PISTILLUM, an oval germen, slender style, and obtuse stigma. PERICARPIUM, the germen succeeds to a baccaceous, hollow, bilocular fruit, of uncertain figure, furnished with numerous compressed seeds.

Modern botanists describe four or five different species of *Capficum*, all tender exotics, mostly natives of the West Indies, of which shall first give the two principal species and their varieties the most generally known and cultivated in our gardens, both as ornamental plants, and for their fruit to use domestically, consisting of an herbaceous annual, and a shrubby perennial; but both of which vary wonderfully into numerous varieties, in regard to the shape, size, and position of growth of the fruit.

The species are,

1. *CAPSICUM annuum*.

Annual Herbaceous Capficum.] *Capficum* with an upright herbaceous stalk, dividing into a branchy head, about two feet high, garnished with long, broad, entire leaves; and from the sides of the branches numerous small, wheel-shaped, quinquifid, white flowers, succeeded by beautiful scarlet or yellow pods, of an indeterminate figure and size, from half an inch to half a foot long.

The varieties of this, in respect to the shape, size, and position of growth of the fruit, are very numerous, which may be divided into six classes, as those of each class are pretty permanent.

Varieties are,

Long-podded Annual Capficum.] *Capficum* with oblong, pendulous or hanging, scarlet pods—with oblong, pendulous, yellow pods—with upright, oblong, scarlet pods—with short upright pods—with divided pods—with very taper pods a span long.—All of which varieties often rise from the same seed of the Common Long-podded, Red, or Yellow *Capficum*, rarely altering from one to the other in colour, only in the size and position of the growth.

Heart-shaped Capficum.] *Capficum* with roundish, heart-shaped, hanging pods—with

oblong, heart-shaped, hanging pods—with heart-shaped, upright pods—with round, heart-shaped, upright pods—with very large, roundish, upright pods, of each of which there are red and yellow colours.

Angular-heart-formed Capsicum.] Capsicum with upright, angular, heart-shaped, furrowed and wrinkled scarlet pods—with upright, angular, heart-shaped, flat-topped, scarlet pods—with upright, angular, bell-shaped, scarlet pods; and the plants have generally broad wrinkled leaves.

Great Angular Pickling Capsicum, or Bell-Pepper.] Capsicum with upright, swelling, fleshy-skinned, wrinkled red pods, flattened and angular at top—with hanging or pendulous pods; the pods of these varieties having a thicker, more fleshy, and tender skin, are the best of all for pickling.

Cherry-fruited Capsicum.] Capsicum with low spreading branches, leaves in clusters, and round, smooth, red, cherry-shaped fruit.

Olive-shaped Capsicum.] Capsicum with an erect branchy head, and olive-shaped fruit.

Each of the above classes of varieties, though allowed to be only varieties of one common parent, yet by care in saving the seeds of the plants of each class, they continue pretty distinct or permanent, and seeds of either generally produce the like kinds, as expressed under each head.

All the varieties flower in June and July, and the pods and seeds ripen in August, September, and October.

The following are the shrubby perennial species and varieties.

2. CAPSICUM frutescens.

Shrubby Perennial Capsicum.] Capsicum with a shrubby perennial stem, divided into a branchy, bushy head, four or five feet high, garnished some with long narrow, and others with broad, and with purple-veined leaves, and small wheel-shaped, five-parted, white flowers, succeeded by many very small fruit of different figures in different varieties.

Varieties of this are,] Shrubby perennial Capsicum, with pyramidal yellow fruit—with pyramidal, red, berry-fruit, or Berry Pepper—with conical, small, red fruit, or Hen Pepper—with conical golden fruit—with oval, very small, red fruit, or Bird Pepper.

All these, though supposed only varieties of the same species, are pretty permanent from seed; i. e. the seed of any particular variety, if saved with care, generally produces plants and fruit of the same kind.

The two following are supposed to be distinct species, but have much resemblance to some of the foregoing varieties.

3. CAPSICUM grossum.

Gross-podded Perennial Capsicum.] Capsicum with an herbaceous, under-shrubby, short, perennial stem and branches; producing large, thick, swelling, solitary, erect fruit, of various forms; the top flattened, wrinkled, angled, and the whole gross and fleshy.

4. CAPSICUM baccatum.

Berry-podded Capsicum, or Bird Pepper.] Capsicum with a shrubby, smooth, even stem; and longish, slender, divaricated branches, growing three feet high; producing small, roundish, berry-like, red fruit—of which, in the West-Indies, where the plants grow plentifully, is prepared the Cayan Pepper.

All these plants, both annual and shrubby kinds, being natives of both Indies, are consequently of tender quality here. The annuals require to be raised and forwarded in hot-beds, raising them from seed in March or April, and continuing them under occasional shelter until the end of May, or beginning of June. And the shrubby kinds require almost the constant temperature of a stove; or, at least, although they will succeed in a moderate hot-bed under a deep frame in summer, where they can have occasional shelter of glasses on nights and bad weather, they must be placed in a stove in autumn, to remain all winter.

The annual kinds in general, considered as plants of ornament, are of a regular branchy growth, and very flowery; but the flowers, being small, do not make any considerable appearance: their greatest merit is in the beauty of the ripe fruit, which, being numerous, and of different forms, sizes, positions of growths, and colours, intermixed with the green leaves and white flowers, make a fine appearance, the latter part of summer, either in the borders, &c. or in pots to adorn courts or other compartments.

And for useful purposes, the young or half-grown fruit is esteemed the finest pickle in the world; all the sorts may be used for this purpose, but the great angular-podded kind, or Bell Pepper, claims preference.

The shrubby sorts make a fine appearance in autumn and winter in the stove, with their ripe fruit, which often continues on the plants till spring.

The pods of all the sorts are very hot and spicy: the inhabitants of America use them in all their sauces, and the negroes devour them greedily; whence the plants have the appellation of Negro or Guinea Pepper.

The ripe pods and seed of all the sorts are insupportably acrid, as many have experienced by ignorantly chewing them, or by waggish persons rubbing them, for diversion, on the edges

edges of drinking-cups, &c. And the ripe pods thrown in the fire, occasion vehement sneezing, coughing, and frequently vomiting.

Propagation of all the Sorts.

All the sorts are easily raised from seed, in a hot-bed, in March or beginning of April. But first of the annual sorts.

A hot-bed is to be prepared at the above time, which will serve for these and many other tender annuals: place a frame and glass thereon, and then lay in five or six inches depth of rich light earth; the seed may then either be sown on the surface, or in small drills, or in pots, plunging them in the mould, observing in either method to cover it about a quarter of an inch deep: the plants will soon appear, observing to give air daily in common with other plants of the bed, by tilting up the light (see ANNUAL PLANTS). Also give frequent very moderate waterings; and when they are two or three inches high, having three or four leaves, it will be of much advantage to prick a quantity of them out upon another hot-bed, at four inches distance, giving water, and shade them occasionally from the sun till rooted; after which admit air freely every favourable day, and moderate waterings two or three times a week; and by the middle of May harden them gradually to the full air, into which they should be transplanted the beginning of June, removing them with a ball of earth to each root, and place some in different parts of the flower-borders, and some in pots, giving due waterings in dry weather, till they have taken good root.

But those you intend as economical plants, to produce plenty of fruit for pickling, should be planted out in a rich warm border, or other compartment, in the kitchen-garden, in rows a foot and a half or two feet distance, and about fifteen inches distant in the lines, giving water as above directed.

The shrubby sorts are also raised from seeds, as directed for the annuals, or sown in pots and plunged in the bark-bed of the stove, &c. and the plants should be pricked singly in small pots, and plunged upon another hot-bed, under frames and glasses, giving air and water as before observed; and when they are considerably advanced in growth, remove them, with the balls to their roots, into larger pots, plunging them also in a moderate warmth under a deep frame, where they may remain to have occasional shelter of the glasses till autumn; then remove them in their pots to the stove, where their fruit will form a fine variety all winter.

CAPSULA, Capsule, one of the eight species of pericarpium, or seed-vessel.

This species of seed-vessel, *Capsula*, is a dry hollow pericarpium, of one or more elastic valves, which opens or splits in some determinate manner, for discharging the seeds when ripe, and differs essentially from the other seven species of seed-vessel. See PERICARPIUM, &c.

A Capsule consists of one or more cells [*Loculamenta*]: when of two or more, they are divided from each other by partitions, having a *Columella*, or little column of membranous substance, passing through it, to connect the several partitions with the seed. When the Capsule consists of a single cell only, it is botanically termed *unilocular*; if of two, *bilocular*; if three, *trilocular*; if four, *quadrilocular*; if five, *quinquelocular*; if six, *sexlocular*; and if many, *multilocular*.

When it is composed of two valves, or parts that open, it is termed *bivalve*; when of three, *trivalve*; when of four, *quadrivalve*; and of five, *quinquevalve*, &c. See VALVULA.

When of different figures, they are termed *trigona*, when three-cornered; *tetragona*, four-cornered; *pentagona*, five-cornered; *turbinata*, top-shaped; *inflata*, swollen or puffed out; *ventricosa*, big-bellied; *flaccida*, feeble, flaccid; *globosa*, round, globular; *ovata*, egg-shaped; *cordata*, heart-shaped; *obcordata*, heart-shaped, with its tip downwards; *columnaris*, column-shaped; *acuminata*, pointed, tapering to a point; *teres*, slender and cylindrical; *conica*, conic-formed; *bicornis*, two-horned; *tricornis*, three-horned; *lunulata*, crescent-shaped; *compressa*, flat, pressed together; *lanceolata*, lance-shaped; *subrotunda*, roundish; *oblonga*, oblong, longer than broad; *bicarinata*, two-keeled; *tricarinata*, three-keeled; *alata*, winged; *succulenta*, succulent, pulpy; *carnea*, fleshy; *lignosa*, woody substance; *coriacea*, leathery substance; *membranacea*, membranous, of thin dry membranes; *didyma*, twin capsules; *emarginata*, notched in the margin; *bisulcata*, two-furrowed; *trisulcata*, three-furrowed; *striata*, streaked, or superficially furrowed; *glabra*, smooth; *echinata*, (from a hedge-hog) prickly; *tomentosa*, downy; *hispida*, bristly, or shaggy; *nuda*, naked, opposed to *hispida*; *pellucida*, pellucid, or transparent; *colorata*, coloured, as in *celastrus*; *elastica*, elastic, bursting elastically like a spring, and darting the seeds from their departments with great velocity, as in some species of *impatiens*, or balsamine, and many others. See ELASTICA.

The number of Capsules succeeding each flower is generally the same as the *germina*, or seed-buds; for the Capsule and all other seed-vessels are each nothing else than the seed-bud, or germen, arrived at maturity (see GER-

MEN). The seed-vessel therefore consists either of one Capsule, as in lychnis; two, as in pœony; three, as in lark-spur; four, as in rhodiola, or rose-root; five, as in columbine, &c.

Capsules, in splitting or opening, are divided externally into one or more pieces, or openings, called *valves* (see VALVULA). This opening of the Capsule for discharging the seeds when ripe, is sometimes at the base, sometimes on the side, through a small hole, as in *campanula*; in some horizontally; and in some longitudinally, as in *convolvulus*; but the most usual opening, in most plants, is at the top, and splits in as many different ways as there are valves.

CARDAMINE, Ladies' Smock, or Cuckoo flower.

It comprises some low, herbaceous, flowering perennials of ornamental appearance, proper for adorning the pleasure-ground.

Class and order, *Tetradynamia Siliquosa*.

Characters.] CALYX, four oval-oblong, deciduous leaves. COROLLA, four oblong, cruciform petals; the lower part erect, and spreading above. STAMINA, six filaments, four longest, the length of the calyx, and two shorter, and heart-shaped, erect antheræ. PISTILLUM, a cylindric germen, no style, but a capitated stigma. PERICARPIUM, a long, cylindric, compressed, bilocular pod, opening spirally, and darting out the seeds with elastic force.

There are many species, but of which one only has claim to attention, which admits of some varieties, which are—

CARDAMINE *pratensis*.

Common Meadow Ladies' Smock.] Cardamine with creeping stringy roots, crowned by many winged, roundish-lobed leaves, spreading on the ground, and several small stalks, a foot high, garnished with lanceolate-lobed leaves, and many flowers, in May and June.

Varieties of this are,] Common Ladies' Smock with single purple flowers—with double purple flowers—single white flowers—with double white flowers.

The flowers of the single kind have four petals, but those of the double sorts are multiplied to the very centre. The single sorts embellish the meadows in great abundance in May, from whence the double sorts were first accidentally obtained, which are highly ornamental and proper furniture for the flower-borders, and will prosper in any situation, but delight most in moist shady places, where they generally produce larger, more beautiful, and durable flowers. They are all easily propagated by slipping or dividing the roots in au-

turn or early in spring; and all the slips, if not parted very small, will readily flower the following May.

CARDUUS, the Thistle.

It comprehends many hardy herbaceous annuals, biennials, and perennials, growing from one to five or six feet high, having very thorny-prickly stems and leaves; and compound flowers in ventricose, scaly, very prickly cups, but being mostly very troublesome weeds, are rarely admitted in gardens, and should generally be eradicated wherever they appear.

CARDUUS *Benedictus*. See CENTAUREA.

CARICA, the Papaw, or Pepo-tree.

This genus furnishes two curious hot-house exotics of tree-like growth, adorned with beautiful, large, divided leaves, and monopetalous and quinquepetalous, white, yellow, and purple flowers, succeeded by very large, fleshy, eatable fruit.

Class and order, *Diœcia Decandria*.

Characters.] CALYX, male and female flowers on separate plants, the males having scarce any cup, and the females a small permanent one, quinquefid at top. COROLLA, the males a funnel-shaped, long, tubular petal, cut into five narrow, blunt, revolute segments; and in the females five long spear-shaped petals turned back at top. STAMINA, ten filaments, five of them alternately shorter than the other, and oblong antheræ. PISTILLUM, an oval germen, very short style, and five broad crenated stigmas. PERICARPIUM, a large, oblong, fleshy, baccaceous, unilocular fruit, full of small oval seeds.

The species are,

1. CARICA *Papaya*.

(*Papaya*)—or *Common Indian Papaw.*] Carica with an upright, thick, soft, hollow, naked stem, rising twenty feet high, garnished upwards with very large, divided, deeply-sinuated-lobed leaves, spreading two or three feet on every side, and male flowers in white clusters on long foot-stalks, yellow or purple female ones growing close round the stem, succeeded by very large, fleshy, yellow, different-shaped fruit.

Varieties.] Common Papaw with male flowers—with female flowers—with melon-shaped fruit—with gourd-shaped fruit—with pear-shaped fruit—with pyramidal fruit.

2. CARICA *Posoposa*.

(*Posoposa*)—or *Branching Surinam Papaw.*] Carica with an upright branching stem; large divided leaves, having entire lobes, spreading widely every way; and reddish male flowers in clusters, and female ones close to the stem, succeeded by very large, pear-shaped, yellow fruit.

Both

Both the species produce male and female flowers on separate plants, so that the female plants only produce the fruit.

All the varieties are very ornamental in their beautiful, very large, many-lobed leaves, making a fine appearance in the stove at all seasons, and some of them flower here annually; and those of the females are succeeded by ripe fruit, which, however, seldom ripen in perfection enough to be eatable.

These plants are propagated by sowing the seed in a hot-bed in March or April; and when the plants are two inches high, prick them in separate small pots of light rich earth, and plunge them in a bark-bed; and towards autumn place them in the stove to remain, giving but very light waterings in winter, but in summer it must be frequently repeated; and as the plants advance in growth, shift them into larger pots; at each shifting be careful to preserve the ball of earth to the roots.

The plants are free shooters; and in this country, in our hot-houses, the first sort particularly has sometimes attained ten or twelve feet stature, or more, in three or four years.

CARPINUS, the Hornbeam-tree.

This genus furnishes three species and some varieties of hardy deciduous forest and ornamental trees, of stature from ten to seventy feet, garnished with simple oblong leaves, and amentaceous or katkin flowers.

Class and order, *Monœcia Polyandria*.

Characters.] CALYX, male and female flowers apart on the same plant, growing each in a loose scaly amentum, each scale containing one flower. COROLLA, no petals in the males, but a cup-shaped six-parted corolla in the female katkins. STAMINA, ten to many filaments, and compressed hairy antheræ. PISTILLUM, two short germens, four styles, and simple stigmas. PERICARPIUM, none; the amentum enlarges, containing at the base of each scale an oval, angular nut.

The species are,

1. CARPINUS *Betulus* (*Vulgaris*).

(*Betulus*)—Common Hornbeam.] Carpinus with an upright straight stem, from thirty to seventy feet stature, feathered from the bottom, and terminating in a very branchy head, adorned with oval-oblong, rough leaves, withering in autumn, but remain firmly attached to the branches till spring, and with plane scales to the cones, furnishing abundance of ripe seed in autumn.

Varieties of this sort,] Common Hornbeam with plain green leaves—Variegated-leaved Common Hornbeam—Cut-leaved Common Hornbeam—Oriental Hornbeam growing ten or twelve feet high, closely branching from

the bottom horizontally, garnished with oval-spear-shaped leaves, and very short cones.

2. CARPINUS *Ostrya*.

(*Ostrya*)—Hop Hornbeam.] Carpinus with an upright stem, attaining twenty feet stature, terminating in a regular head, garnished with oval-oblong, rough leaves, and hop-like fruit, having inflated scales.

3. CARPINUS *virginiana*.

Virginia flowering Hornbeam.] Carpinus with an upright stem, growing thirty feet high; the branches closely garnished with long, spear-shaped, pointed, rough leaves, of a deep-green colour, falling off in autumn; and yellowish flowers, succeeded by very long strobiles or fruit-cones.

All these species and varieties of *Carpinus* are very hardy, and will prosper in almost any soil and exposure, and of which there are varieties well adapted both for use and ornament.

As to the Common Hornbeam, it flourishes not only in good ground, but in any hungry barren soil, light or stiff, as well as in all hilly and other bleak exposed places, and is very proper to be planted as a forest tree, and for ornament in parks, either as single standards, or in clumps or large plantations, in assemblage with other deciduous trees: and as it retains its leaves, in a withered state, all winter, it affords shelter to less hardy trees, and is therefore well adapted to border plantations, to break the northerly and boisterous winds.

This tree is also remarkably well adapted for hedges, either by way of ornament or shelter, for it is feathered to the very bottom, and may readily be trained to any desired height.

As the timber of this tree is valuable for many economical uses, a wood of them may be easily raised on any soil to advantage, planting young plants, of three or four to five or six feet stems, in rows, four or five feet distance, and half that in the lines, and after a few years' growth every other tree in the row may be thinned for poles and other small purposes; and so continue thinning them by degrees, according as they increase considerably in larger growth, crowding one another; always leaving a sufficiency of the handsomest straight plants, at moderate distances, to acquire full growth for timber.

The other sorts are also very proper for large ornamental plantations to increase the variety, and the oriental kind is particularly well adapted for low close hedges; all the others, being also generally pretty well feathered, may also be used occasionally both for that purpose, and for diversifying large shrubberies.

Propagation

Propagation of all the Sorts.

The common sort may be raised plentifully from seed sown in autumn in four feet wide beds, covering it an inch deep, and in the spring the plants will rise, or sometimes not till the spring following: or may preserve the seeds till spring, then sow them in February or March; but the plants will not generally rise till the second year; observing in either method, that when the plants have had two years' growth in the seed-bed, they should be transplanted in the nursery, in rows two feet and half distance, and half that in the rows; and when from three to six or eight feet high, are fit for any plantation, useful and ornamental.

This sort may also be raised abundantly by layers in autumn, which will be rooted and fit to transplant by that time twelvemonth.

All the other sorts may also be raised easily from seed and layers, but the latter method is the only way to continue the different varieties distinct.

CARTHAMUS. Bastard Saffron.

The plants of this genus consist of some ornamental herbaceous annuals and perennials, producing stalks two or three feet high, crowned by yellow and blue compound flowers.

Class and order, *Syngenesia Polygamia Æqualis*.

Characters.] CALYX, a compound flower, having the general cup composed of many leafy scales broad at the base. COROLLA, is composed of many hermaphrodite florets, divided at top into five erect segments. STAMINA, five short filaments, and cylindric tubular antheræ. PISTILLUM, a short germen, slender and simple stigma. PERICARPUM, none; a single seed in each floret lodged in the calyx.

The principal species are,

1. **CARTHAMUS tinctorius.**

Dyer's Carthamus, or Common Bastard Saffron.] Carthamus with an upright, smooth, branchy stalk a yard high, garnished with oval, entire, spiny-ferrated, close-fitting leaves, and all the branches crowned by large single heads of saffron-coloured florets, extending an inch above the calyx.

The flowers of this species are used in dying, and for medicinal purposes.

2. **CARTHAMUS lanatus.**

Woolly Carthamus, or Yellow Distaff Thistle.] Carthamus with bottom leaves pinnatifid, hairy, and prickly; an upright woolly stalk two feet high, branching above, garnished with sinuated, hairy, spinous leaves, their base embracing the stalks, and all the

branches surmounted by single heads of yellow flowers.

3. **CARTHAMUS caruleus.**

Blue Perennial Carthamus.] Carthamus with upright, channelled, single stalks, two feet high; broad, spear-shaped, indented, spinous leaves; and one blue flower terminating each stalk.

4. **CARTHAMUS tingitanus.**

Tangier Blue Perennial Carthamus.] Carthamus with the radical leaves pinnated; upright, slightly branching stalks a foot and half high, garnished with pinnatifid prickly leaves, and one blue flower terminating each stalk.

The flowers of all the sorts are compound, consisting of many florets in very large, leafy, scaly cups, which, in all the sorts, appear in July and August, and the seed ripens in autumn: they all succeed in the open borders, and will add to the variety of flowering plants.

The two first sorts are hardy annuals, and may be sown in March in the places where it is designed they shall flower; or if sown in a hot-bed it will forward them, so plant them out in May.

The two perennial sorts are propagated by parting their roots in autumn or spring; or by seeds in a bed of light earth in March.

CARUM, Carui, or Caraway.

It comprises but one species, an herbaceous, umbelliferous, aromatic biennial, esteemed for its seeds for cookery and medical use.

Class and order, *Pentandria Digynia*.

Characters.] Umbelliferous flowers, each general umbel composed of ten smaller, and each floret of five petals, having five stamina, two styles, and two seeds.

The species is,

CARUM Carui.

Common Carui, or Caraway.] Carum with a long, taper, perpendicular, white root, crowned by winged, decompound, finely, many-parted leaves, on long foot-stalks, and one or two erect, channelled, branchy stems, two feet high, having all the branches terminated by umbels of white flowers in June, and ripen seeds in autumn.

It is propagated by seed in the open ground in spring or autumn, sowing them either in shallow drills, or by broad-cast, and rake them in; and when the plants are come up two or three inches high, hoe them to five or six inches distance, which in spring following will shoot up stalks, and produce flowers and seed, and the plants soon after perish.

If the seeds are sown in autumn, the plants will come up, stand the winter, and produce seeds the following summer.

CARYO-

CARYOPHYLLUS, the Clove Tree, an Indian aromatic for the stove.

Class and order, *Icosandria Monogynia*.

Characters.] **CALYX**, a monophyllous, small, obtuse, double cup, divided into four segments, and placed above the germen. **COROLLA**, four roundish, concave petals, inserted in the cup. **STAMINA**, twenty or more thread-shaped filaments, topped with oblong antheræ. **PISTILLUM**, an oblong, two-celled germen, with a thick, awl-shaped style, and simple stigma. **PERICARPIUM**, an oval, bilocular berry, containing a large oblong seed.

The species is,

CARYOPHYLLUS aromaticus.

Aromatic Clove Tree.] Rises to twenty or twenty-five feet high, dividing, four or five feet from the ground, into branches which grow erect, covered with a smooth bark, and subdivided into many smaller; garnished with oval-spear-shaped leaves, placed opposite; and small white flowers terminating the branches in loose bunches, succeeded by oval berries, crowned with the permanent calyx.

The berries, when half-grown, gathered, dried, and imported here, are the cloves of the shops.

The propagation of this tree is by ripe seeds, procured from abroad. They must be sown in pots and plunged in a hot-bed; and afterward, when come up, removed to the bark-bed in the stove, where they must constantly be retained.

CASSIA, Wild Senna.

It consists of trees, shrubs, and herbaceous plants, of American growth, adorned with winged, many-lobed leaves, and quinquepetalous flowers, cultivated here in our stoves and pleasure-grounds for variety.

Class and order, *Decandria Monogynia*.

Characters.] **CALYX**, five concave, coloured, deciduous leaves. **COROLLA**, five roundish, concave, patent petals. **STAMINA**, ten declinated filaments, having to the three lower ones large, arched, beaked, open-pointed antheræ, which in the three upper ones are very small, and in the four side ones open without beaks. **PISTILLUM**, a taper germen, short style, and blunt stigma. **PERICARPIUM**, an oblong pod, having transverse partitions, containing roundish seeds.

The species chiefly cultivated in our gardens are,

1. **CASSIA Fistula.**

(Fistula)—or *Purging Tree-Cassia of Alexandria.*] Cassia with an upright trunk, dividing into many branches, and attains forty to fifty feet stature; winged leaves of five pair of oval sharp-pointed lobes; and from the

ends of the branches long spikes of deep-yellow flowers, succeeded by round hard pods one or two feet long, containing the seeds lodged in a black, sweetish, purging pulp, used in medicine.

2. **CASSIA biflora.**

Two-flowered Shrub-Cassia.] Cassia with shrubby stalks and branches three or four feet high; winged leaves of six pair of oblongish smooth lobes, having subulated glands between, and foot-stalks from the axillas; each supporting two flowers, succeeded by jointed plane pods.

3. **CASSIA ligustrina.**

Privet-lobed Shrub-Cassia.] Cassia with a shrubby stalk, branching three or four feet high; winged leaves of seven pair of small spear-shaped lobes or folioles, the last pair the smallest; and from the upper parts of the branches, terminal bunches of yellow flowers, succeeded by oblong, compressed seed-pods.

4. **CASSIA marilandica.**

Maryland Herbaceous Wild Senna.] Cassia with black, fibry, perennial roots; upright annual stalks near a yard high; winged leaves of eight or nine pair of oval-oblong lobes; and the stalks terminated by loose spikes of yellow flowers, but rarely any seeds here.

The four following are less common, but are retained in many curious collections in our stoves; and are all of the woody or shrubby kind, exotics of the Indies.

5. **CASSIA Javanica.**

Java Cassia.] Cassia growing with a large woody stem, dividing into a very branchy head, growing many feet high: leaves composed of twelve pair of oblong, obtuse, smooth folioles, and at the ends of the branches loose spikes of reddish flowers, succeeded by large, long, cylindric pods, two feet long.

6. **CASSIA fruticosa.**

Shrubby Cassia of La Vera Cruz.] Cassia growing with several shrub-like, branchy stems, fifteen or twenty feet high, adorned with leaves composed of two pair of ovate-lanceolate, smooth lobes, and terminal loose spikes of golden yellow flowers, succeeded by long roundish pods near a foot long.

7. **CASSIA emarginata.**

Emarginated Cassia, or Jamaica Senna-Tree.] Cassia with a shrub-like stem, dividing into many branches, growing ten or twelve feet high; downy leaves composed of three or four pair of ovate folioles; and racemi of yellow flowers irregular, succeeded by flat broad pods.

8. **CASSIA villosa.**

Villose-leaved Cassia of Campeachy.] Cassia with a shrubby woody stem, branching ten or twelve feet high; villose, or hairy leaves,

composed of three pair of oblong-ovate folioles, and small pale-yellow flowers at the ends of the branches succeeded by long, narrow, jointed pods.

The flowers of all the sorts separately are composed of five concave petals, appearing in July, and other times in summer, sometimes succeeded by pods in England.

The first three sorts being natives of warm climates, in this country must be potted, and retained always in the stove; the first of which, (*Cassia Fistiula*) though in its native soil, Ægypt and both Indies, it obtains a considerable stature, rarely grows higher than eight or ten feet here; so that this and the other two shrubby sorts are within the limits of our stoves, where they will flower annually and make a good appearance, and their long pods will effect a singular variety.

The above three plants should be kept in pots of light earth, and kept principally in the hot-house; or may be placed in the open air in the middle of summer, in warm dry seasons; and might be preserved in a good greenhouse in winter, but generally most successfully in a hot-house or stove, managing them as other plants of that department, giving them frequent waterings in summer, but more sparingly in winter. See STOVE PLANTS.

The other four shrubby species being also tender exotics, require the same management as above.

The fourth sort (*Cassia marilandica*) is hardy enough to prosper in a dry soil in the full air, and is proper furniture for the common flower-borders, where its flowers will make a beautiful appearance.

Propagation.

The first three shrubby sorts are raised from seeds procured from abroad, sowing them in spring in pots of light sandy earth, plunging them in a hot-bed; and when the plants are three inches high, prick them in separate small pots, plunging them also in a hot-bed or bark-bed of the stove, giving shade and water, and fresh air occasionally, in common with the other plants of that department.

The herbaceous sort is also raised from seeds procured from America, sowing them in April half an inch deep in a warm border; the plants will rise in a month, which in September or October may be planted out in the borders. Also by slipping the roots.

CASSINE, Hottentot Cherry, and Cape Phillyrea, formerly *Maurocenia*.

Of this genus are two beautiful evergreen African shrubs for the green-house, adorned with simple leaves, and clusters of white flowers.

Class and order, *Pentandria Trigynia*.

Characters.] CALYX, a small, five-parted, permanent cup. COROLLA is divided into five suboval, obtuse segments. STAMINA, five spreading filaments, and simple antheræ. PISTILLUM, a conical germen, superior, no style, but three reflexed stigmas. PERICARPium, an umbilicated trilocular berry, having three seeds.

The species are,

1. CASSINE *Maurocenia*.

Maurocenia, or Hottentot Cherry.] Cassine with a woody, branching stem six or eight feet high; suboval, thick, entire, rigid leaves; and small clusters of white flowers at the sides of the branches, succeeded by large, roundish, red, cherry-like fruit, ripening here in winter.

2. CASSINE *capensis*.

Cape Cassine, commonly called Cape Phillyrea.] Cassine with a woody branching stem, growing five or six feet high: ovate-oblong, stiff, opposite leaves, on short petioles; and at the sides and ends of the branches, roundish clusters of white flowers, succeeded by red berries, but seldom appear in this country.

For some other species nearly related and formerly of this genus, as *Cassio-berry bush* and Yapon, see ILEX, PRINOS, and VIBURNUM.

The flowers separately of both sorts have the corolla divided into five spreading segments, and the season of flowering is July.

Both of the above species having singularly beautiful leaves, appearing very ornamental all the year, merit places in every greenhouse collection; they must be kept in pots of rich light earth, and continued in the open air all summer, and the green-house in winter, managing them as other woody exotics of that department. See GREEN-HOUSE PLANTS.

Propagation.

They are propagated by seeds and by layers of their young branches.

Sow the seed in spring in pots of light earth plunged in a hot-bed, or the stove bark-bed, and when the plants are two or three inches high, prick them in separate pots, placing them also in a hot-bed; and afterwards gradually harden them to the full air for the remainder of the summer.

By layers:—chuse young shoots, lay them in spring or autumn; and by autumn following they will be rooted, and fit to be planted off into separate pots.

CASTRATIO, Castration of Plants.

Castrated plants are such as are deprived of the male organs, i.e. the antheræ, either by nature, or by having them cut off,

as sometimes practised, to try experiments with respect to the doctrine of the sexes of plants. See SEXUS.

CATANANCHE, Candia Lion's-foot.

This genus furnishes hardy herbaceous ornamental plants, obtaining two feet stature, adorned with long jagged leaves, and terminated by compound blue flowers.

Class and order, *Syngenesia Polygamia Æqualis*.

Characters.] CALYX, compound flowers, having a scaly, elegant, permanent, general cup. COROLLA, many broad, tongue-shaped, five-parted, hermaphrodite florets. STAMINA, five filaments, and cylindric pentagonal antheræ. PISTILLUM, an oblong germen, slender style, and a two-parted, revolute stigma. PERICARPIUM, none; oval seed, crowned by a downy pappus, lodged in the calyx.

There are two species, a perennial and annual, the former of which only merits culture, which is,

CATANANCHE Cærulea.

Perennial Blue-flowered Catananche.] Catananche with a fibry perennial root, crowned by long, narrow, jagged, hairy, prostrate leaves; upright, branchy stalks two feet high, garnished with small leaves, and all the branches terminated by single heads of blue flowers, having purple bottoms, golden antheræ, and silvery cups.

Variety.] Perennial Blue Catananche with double flowers.

These are very ornamental flowery perennials, both in their single and double state, continuing in flower from May till September, and succeed in the full ground in dry and somewhat sheltered borders, where they will endure many years, and produce flowers and ripe seed annually; but being somewhat tender, it is proper to keep some also in pots for shelter in winter by way of reserve.

As to their propagation, the single sort is propagated by seeds sown half an inch deep, in a bed of light earth, in March or April.

Both single and double may also be propagated plentifully by slipping their roots in autumn, or early in spring; but do not slip them too small, because the larger the root, the greater the number of stalks they send up for flowering.

CATERPILLARS, destructive insects in our kitchen-gardens, particularly to the cabbages and savoys in the end of summer.

The sort which principally infest our gardens, is that yellowish-green, dark-spotted Caterpillar, generated from the eggs of the white butterfly, which they are continually

depositing every where, and in a few days are metamorphosed to living insects, spreading themselves surprisngly, and devour the leaves of all the cabbage tribe, first attacking the outward leaves, and, if not prevented, continue their depredations to the very heart of the plants.

When our greens, &c. are thus attacked, we have no other remedy than to pick the vermin off repeatedly by hand, which may appear a tedious process, though, in small gardens, it may be so far practicable, as greatly to diminish their numbers, especially if undertaken before they spread considerably from their nests; but in large open grounds the plants often escape, when those in more confined places are severely attacked, and more particularly those in the corners of gardens, near walls, buildings, or hedges, which should caution us not to plant any of the cabbage tribe too near such places, nor, if possible, where much crowded with trees, for the same reason.

Besides the above sort of Caterpillar, there is a large, dark-coloured, tough-skinned sort, generated in like manner in the heart of the inclosed leaves of the autumn cabbages, savoys, &c. and detach themselves from their lodgement by eating holes through all the leaves.

This Caterpillar also burrows in the earth, to the destruction of all sorts of young plants, by eating their shanks asunder; but as it burrows just within the surface, it may be readily found, by stirring the ground with the fingers about the plants.

Our fruit-trees are also often attacked in very dry weather by Caterpillars, to the destruction of their leaves, &c. nor is there any certain method to destroy them, but by picking their nests off by hand, where practicable, before the vermin begin to spread themselves; or if they have already spread, to dash the trees frequently with water from an engine.

Or sometimes, the effect of elder branches drawn over plants and trees is employed to assist in preventing and extirpating the insects, or lessening their depredations.

The leaves of the elder tree emitting a rank disagreeable odour, generally very noxious to most insects, so as they will avoid plants and places touched therewith; and therefore, having some branches and leaves together of the elder, and frequently whisk them along the plants and trees, which appear the most liable to the attack of the caterpillars, &c. the elder branches thereby discharging and leaving part of their nauseous effluvia on the plants, it will contribute considerably

in diminishing and preventing the formidable attack of the vermin.

CATESBÆA, Lily-thorn.

There is but one species for our purpose, an exotic, small-leaved shrub of the hot-house.

Class and order, *Tetrandria Monogynia*.

Characters.] CALYX, a monophyllous, four-parted, permanent cup. COROLLA, one funnel-shaped, very long, tubular petal, broad, and four-parted at top. STAMINA, four filaments, and oblong, erect antheræ. PISTILLUM, a roundish germen under the corolla, long style, and simple stigma. PERICARPIUM, an oval unilocular, sometimes bilocular berry, containing angular seeds.

The species is,

CATESBÆA spinosa.

Thorny Bahama Catebæa, or Lily-thorn.]

Catebæa with a woody, rustety, spinous stem branching alternately, rising eight or ten feet high; small roundish leaves in clusters; and very long, pendulous, yellow flowers, singly from the sides of the branches, succeeded by oval, fleshy, saffron-coloured berries.

This shrub must be always kept in pots of light sandy compost, and retained constantly in the stove.

It may be propagated by seeds, and by cuttings of its young shoots; the seeds are procured from abroad, which sow in pots of light earth, and plunge them in the bark-bed. Cuttings may be planted any time from April till July, in pots plunged in the tan-bed; and if close covered with hand-glasses, will facilitate their rooting.

CATKIN, an amentaceous flower, i. e. consists of a great number of chaffy scales and flowers, dispersed along a slender thread-like receptacle, hanging downward, and is the male flowers of the trees which produce them, as birch, beech, pine, fir, poplar, walnut, hazel, &c. See AMENTUM.

CAULESCENS Planta, from *Caulis* the stem, having a stem or trunk as in most plants, opposed to *Acaulis*.

CAULIS, a Stalk or Stem, the first and most common species of *Trunk*, expressive of that part of a plant or tree which arises immediately from the root, produces and supports the branches, leaves, flowers, and fruit. See TRUNKS.

A Stalk, Stem, or Trunk, is either simple, simple-branching, or compound-branching.

As for example, simple Stalks are such as rise singly, and continue undivided from the root to the top; simple-branching Stems may be deemed such as either rise wholly undi-

vided, but send out many side or lateral branches, or such as proceed singly to some considerable length, and then divide into branches near the top; compound-branching Stems are such as soon divide low into others, and these subdivide into many *ramuli* or branches.

As Stems assume different directions, shapes, and other appearances, the botanists distinguish them accordingly by the following different terms:

Caulis integer, entire or simple Stalks, and which are either *erectus*, erect, or upright, as in most plants; *flexuosus*, of different directions at each joint; *reclinatus*, reclining, or bending archways to the ground; *volubilis*, voluble, twining or winding ascendingly round other plants or any support, either to the left as in honeysuckle, hop and black briony; or to the right, as in convolvulus, kidney-bean, &c. *obliquus*, growing asslant; *procumbens*, lying along the ground; *repens*, creeping along the ground, rooting at every joint.

Caulis Ramosus, simple-branching Stems, which are also either erect, flexuose, reclining, voluble, &c. as above, and have different terms according to their modes of branching, as *ramosus*, branching out laterally; *ramosissimus*, very branchy; *ascendens*, the branches gradually curving upwards; *diffusus*, diffused, or very spreading branches; *brachiatus*, large arms, or branches in pairs, each pair standing at right angles with those immediately above and below; *fulcratus*, supported by branches descending to the earth; *prolifer*, prolific, branching only from the apex or summit.

Caulis Compositus, compound branching Stems, and, according to their modes of branching, are termed *dichotomus*, forked or divided into others, the divisions by two and two; *subdivisus*, the divisions subdivided into many branches irregularly.

Articulatus, articulate, or jointed, composed of many joints, or divisions, having knots at certain distances.

Parasiticus, parasitic, growing out of, and supported on other plants or trees, as the mile-toe.

When Stems are of different figures, they are denominated *Caulis teres*, cylindrical and taper; *anceps*, two-edged; *trigonus*, three-angled; *triquetrus*, triquetrous, having three plane sides; *tetragonus*, square, or four-angled; *pentagonus*, five-angled; *polygonus*, many-angled.

When furrowed, smooth, rough, &c. they are *Caulis sulcatus*, deeply furrowed; *striatus*, streaked, or superficially furrowed or fluted; *glaber*,

glaber, a smooth surface, opposed to *scaber*, rough, scabby, or full of rigid points or tubercles; *villosus*, hairy or shaggy; *hispidus*, hispid or bristly; *aculeatus*, prickly; *spinosus*, spinous, thorny; *tomentosus*, tomentose, or downy.

Leafless and leafy Stalks are termed *Caulis nudus*, naked or leafless; *foliatus*, foliose, or ornamented with leaves, as obtains in most plants.

As to duration, Stems are either of one year's duration, *Caulis annuus*; of two, *Caulis biennis*; of many years' duration, *Caulis perennis*, as obtain in all trees and shrubby plants.

CEANOTHUS, New - Jersey Thea, so called from the leaves being there used as tea.

This genus retains three species of the tree and shrub kind, consisting of one for the shrubbery, one for the green-house, and one for the stove, all garnished with simple leaves, and numerous spikes of quinquepetalous white flowers.

Class and order, *Pentandria Monogynia*.

Characters.] **CALYX**, a monophyllous, turbinate, acutely-five-parted, permanent cup. **COROLLA**, five roundish spreading petals. **STAMINA**, five subulated filaments, and roundish antheræ. **PISTILLUM**, a trigonal germen, cylindric, semitrifid style, and obtuse stigma. **PERICARPIUM**, a dry, trilocular, obtuse berry, having three oval seeds.

The species are,

1. **CEANOTHUS americanus**.

American Deciduous Ceanothus, or New-Jersey Thea.] Ceanothus with a shrubby, very branchy stem about a yard high, sending out numerous reddish, flexible branches from the bottom upward, garnished with oval, serrated, pointed, trinervous leaves, and all the branches and shoots terminated by thick, spiked clusters of bright white flowers, in July, of very ornamental appearance.

2. **CEANOTHUS africanus**.

African Evergreen Ceanothus, sometimes called Alaternoides.] Ceanothus with a woody, rough stem, and weak purplish branches, rising eight or ten feet high; spear-shaped, pointed, serrated, smooth, shining green leaves, and clusters of small greenish flowers from the sides of the branches.

3. **CEANOTHUS asiaticus**.

Asiatic Ceanothus.] Ceanothus with a shrubby, branchy stem, growing four feet high; oval, pointed, close-sitting, alternate leaves; and greenish flowers in small clusters from the sides of the branches.

The flowers separately of all the sorts are composed of five small petals appearing in

July, which of the first sort are sometimes succeeded by ripe seeds in England, but never any of the others.

The first species, *Ceanothus americanus*, is a most elegant little flowering shrub, as when in flower it appears wholly covered with bloom, and therefore is well calculated for the most conspicuous compartments of the shrubbery plantations, allowing it a moderately dry soil and somewhat sheltered situation in the fronts of the clumps.

The second sort is also worthy of a place in the green-house collection, for the beauty of its shining green leaves, appearing ornamental the year round.

The third sort is also retained in some of our stoves for variety.

With respect to the general culture of these three species of *Ceanothus*; the first of which being stationed in the shrubbery, requires only the common occasional culture of other shrubs in that district: and the second and third, for the green-house and hot-house, are managed as the other woody exotics of those repositories. See **SHRUBBERY**, **GREEN-HOUSE**, and **HOT-HOUSE**, &c.

Propagation.

The first sort is propagated both by seeds and layers.

Sow the seed in autumn or spring, or as soon as they can be procured, in pots of light compost a quarter of an inch deep, placing them in a frame, to have occasional shelter in bad weather; and in spring plunge them in a hot-bed to bring up the plants, hardening them gradually to the full air in summer, but remove them in autumn, to have occasional shelter until March; then plant them out in separate small pots, or in a nursery-bed in the full ground, where they can be covered occasionally again the following winter, for they must have protection from severe frost the two or three first years of their growth.

To propagate them by layers, chuse some of the youngest branches in autumn, and lay them in the usual way, which will be rooted in a twelvemonth, and in spring after transplant them; or, if you likewise lay some of the first young shoots in June or July, you will have the greater chance of success.

The second sort is propagated expeditiously by laying down the young shoots, either in their own pots, or others placed for the purpose; it is likewise increased by young cuttings, planted in the spring in pots, plunging them in the bark-bed, or any other hot-bed, about two months; and being thus raised, give the general management of green-house plants.

The third species may be raised from seeds in pots of light earth, plunging them in the bark-bed, &c. likewise by laying the young shoots, plunging the pots as just directed, and the plants afterwards managed as other woody exotics of the stove.

CEDRELA, Bastard-Cedar.

Consists of a large exotic tree for the stove, garnished with winged leaves, and pentapetalous flowers.

Class and order, *Pentandria Monogynia*.

Characters.] **CALYX**, a small, monophyllous, campanulated, withering cup. **COROLLA**, funnel-shaped, bellied below, having five linear-oblong, blunt, upright petals, joined to the receptacle. **STAMINA**, five succulent filaments, with oblong antheræ. **PISTILLUM**, a five-angled, woody receptacle, with a globose germen, cylindric style, and depressed capitated stigma. **PERICARPIUM**, a ligneous, roundish capsule, with five cells, opening with five deciduous valves, and containing fleshy, imbricated seeds, each terminated by a membranaceous wing.

We know but of one species, viz.

CEDRELA odorata.

Odorous Barbadoes Bastard-Cedar.] Rises with a woody trunk branching twenty feet high, the branches garnished with winged leaves composed of several pair of folioles on short footstalks; the flowers come out from the sides of the branches in loose panicles, emitting a strong, rank odour, and are succeeded by woody capsules opening in five cells, containing imbricated, winged seeds.

This tree, in the West-Indies, rises to between twenty and thirty feet high, and the wood, which is scented, is used for many purposes: its propagation is by seeds obtained from abroad, which should be sown in small pots of light earth and plunged in a hot-bed; and when the plants are come up about two or three inches high, they must be carefully taken up and transplanted, each in a separate pot, and plunged in the bark-bed, shading them until they are fresh rooted; and may afterwards be managed as other woody stove exotics.

CELASTRUS, Staff-tree.

In this genus are some curious evergreen and deciduous shrubs for the shrubbery and green-house, of moderate growth, ornamented with simple leaves, and bunches of whitish five-petaled flowers.

Class and order, *Pentandria Monogynia*.

Characters.] **CALYX**, a monophyllous, unequally half-five-parted cup. **COROLLA**, five oval, spreading, equal petals. **STAMINA**, five filaments, and very small antheræ. **PISTIL-**

LUM, a small germen immersed in a very large receptacle, marked with ten channels; a short style, and blunt trifid stigma. **PERICARPIUM**, a trigonal, trivalvate, trilocular, coloured capsule, and oval seeds.

The species are as follow: the two first are hardy shrubs.

1. **CELASTRUS bullatus.**

Studded-fruited Celastrus, or Virginia Evergreen Staff-tree.] Celastrus with several upright, shrubby, branching stems, growing six or eight feet high; ovate-oblong, entire, alternate leaves; and at the ends of the branches spikes of white flowers, succeeded by three-cornered, scarlet, bullated or studded capsules, which rarely attain perfection in England.

2. **CELASTRUS scandens.**

Climbing Staff-tree, or Bastard Euonymus.] Celastrus with climbing shrubby stalks, twining upon support, or about each other, twelve or fifteen feet high; oblong slightly-sawed leaves placed alternate; and greenish flowers in bunches at the sides of the branches, succeeded by three-cornered red capsules, ripening here in autumn, spreading open, and discover the seed, like the common Euonymus.

The three following are green-house shrubs.

3. **CELASTRUS pyracanthus.**

Pyracantha-leaved Evergreen Celastrus, or Ethiopian Box-thorn.] Celastrus with shrubby, upright, irregular stems, and roundish, brown branches, growing a yard or more high; garnished with spear-shaped, pointed, shining green leaves, and cymose bunches of whitish-green flowers at the sides of the branches, succeeded by oval, trigonous, beautiful red capsules.

4. **CELASTRUS buxifolius.**

Box-leaved Evergreen Celastrus.] Celastrus with slender, ligneous, jointed, ash-coloured, spinous stems, and angular spinous branches rising eight or ten feet high; small, longish, obtuse leaves, placed in clusters irregularly; and cymose bunches of whitish flowers.

5. **CELASTRUS myrtifolius.**

Myrtle-leaved Celastrus.] Celastrus with woody, upright, unarmed stems and branches, growing twelve or fifteen feet high; small, ovate, serrated, deep-green leaves; and long bunches of whitish flowers at the sides of the branches.

The flowers of all these species are composed separately of five oval, spreading petals, and appear principally in June and July.

The first two species are proper for the embellishment of the shrubbery compartments, the first of which, *Celastrus bullatus*, should have a dry and somewhat sheltered situation in the fronts of clumps, and they will retain their leaves most of the year; but the second
fort

sort is exceeding hardy, and will prosper any where among trees and tall shrubs, on the edge of plantations, or in woods and wildernesses, where its volubilate stems will mount themselves considerably, and their ripe fruit will make an elegant appearance in autumn.

The last three sorts are tender, so must be always kept in pots to have shelter of a greenhouse in winter.

They are elegant furniture for the greenhouse collection. Let them be planted separately in pots of rich light mould, and manage them as myrtle and other shrubby exotics of the like temperature. See GREEN-HOUSE PLANTS.

Propagation of all the Sorts.

The first two sorts are raised from seeds in beds of light earth; also by layers of their young branches.

Sow the seeds in autumn, or early in spring, an inch deep, in a bed of light fine earth, observing, that as the plants rarely rise till the second spring, the beds all the intermediate time must be kept clean from weeds; and when the plants rise, continue the care of weeding and occasional waterings in summer; and after having two years' growth in the seed-bed, plant them out in nursery-beds.

Cuttings may also be struck by aid of artificial heat.

It is performed by layers in spring or autumn, making choice of the young wood, giving each layer a slit underneath at a joint, and they will be rooted, and fit to transplant in rows the autumn following.

The three green-house kinds may also be propagated by seeds, layers, and cuttings. Sow the seed in pots an inch deep, as soon as they can be procured in autumn or spring, and place them in a frame, to have shelter in bad weather, and occasional shade in summer; and when the plants are a year old, plant them in separate pots.

Cuttings planted in pots in spring, and plunged in a hot-bed a month or two, will readily emit roots.

Layers of the young branches in spring will be rooted by autumn.

CELOSIA, *Amaranth*, or Cock's-Comb.

This genus furnishes beautiful ornamental annuals, rising from one to five or six feet high, garnished with large oval or spear-shaped leaves, and crowned by most elegant large heads of flowers, in some resembling the figure of a cock's-comb.

Class and order, *Pentandria Monogynia*.

Characters.] **CALYX**, a coloured, small, three-leaved, permanent cup to each floret.

COROLLA, five spear-shaped, erect, stiff, permanent petals, shaped like the calyx, and a small nectarium attached to the border of the germen. **STAMINA**, five filaments, and turning antheræ. **PISTILLUM**, a globose germen, erect style, and single stigma. **PERICARPIUM**, a small globular capsule of one cell, and very small roundish seeds.

There are several distinct species, all very beautiful garden-flowers; but the sort called Cock's-Comb is the most grand and elegant of all, and which is the sort most commonly cultivated in our gardens, and the first species here described, which admits of several varieties in respect to stature, and in the colour of the flowers.

The species are,

1. **CELOSIA cristata.**

Crested Flowered Amaranth, or Cock's-Comb.]

Celosia with an upright, single, stiff stalk, from one to five or six feet high, ornamented from bottom to top with large, oval-spear-shaped leaves, on angular foot-stalks, and the main stalk crowned by a large, crested, flowery head, composed of numerous small florets very closely placed.

Varieties of this are,] Dwarf Cock's-Comb, from six inches to a foot and half high, with large purple heads of flowers—with red heads—with scarlet heads—and with yellowish heads.—Giant Cock's-Comb, from a yard to five or six feet high, with very large purple heads—with red heads—with scarlet heads—with yellowish heads—with white heads—and with variegated heads.—Branching Cock's-Comb, dividing into several branches, each terminated by small heads, of which are purple, red, buff-colour, &c.

2. **CELOSIA margaritacea.**

Pearly-coloured Spiked Celosia.] Celosia with an upright, branchy stalk two feet high; spear-shaped-pointed, pale leaves; and the main stalk and every branch terminated by small, ovate-oblong, erect, pearly-coloured heads, forming spikes the size of a large finger.

Varieties.] Pearly Celosia with oblong spikes of equal thickness—with pyramidal spikes—with entire white spikes—with white and red spikes.

3. **CELOSIA coccinea.**

Scarlet Spiked Celosia.] Celosia with an upright, large, round, furrowed stalk, a yard or more high; oval, stiff leaves; and the stalks terminated by several small bright scarlet heads, forming spikes.

Varieties.] Indian Scarlet Celosia with crested spikes—with incurved crested spikes—and with plumed spikes.

4. **CELOSIA lanata.**

Downy

Downy Clustered-Spiked Celosia.] *Celosia* with an upright, downy, white stalk, two feet high; lanceolate, obtuse, very downy leaves; and the stalk and branches terminated by clustered spikes of flowers, having woolly stamina.

5. *CELOSIA castrensis.*

Dwarf Crested-Spiked Celosia.] *Celosia* with an upright very branchy stalk a foot and half high; lanceolate acutely-pointed leaves; and all the branches terminated by crested spikes of flowers of several varieties.

The flowers of all these species, though separately very small, being exceeding numerous, and collected into large, compact, crested heads, or in oblong spikes, appearing as one large flower, are extremely conspicuous and elegant, and exhibit a grand appearance in a garden from July to October, particularly the first species, Cock's-Comb and varieties, which produce their flowers in very large plumes or crested heads, generally but one plume crowning each plant, in size from four or five to fifteen inches longways over the crown, and from two to five or six broad, and of proportionable depth.

Of the first species, *Celosia cristata*, are two principal varieties, the Dwarf and Giant Cock's-Comb; the former of which, though dwarfish, is of very robust growth, leaved to the bottom, and crowned by elegant heads, and is esteemed a curiosity; but the Giant sorts make the grandest shew, as, with due culture, they attain at least a yard, but frequently five or six feet stature, the stem decorated from the very bottom with elegant large foliage, and surmounted each by a wonderful large fine flower-head; they however require great attention to bring them to real perfection, needing the aid of three different hot-beds, in which to raise and move them from one to another at three or four weeks' interval, and different sized deep frames, to draw them up tall; but the dwarf sorts may be raised in tolerable perfection by the assistance of two hot-beds and common frames, and are therefore the properest sort for gardens that are not well furnished with hot dung and garden-frames.

The principal property of a fine Cock's Comb is, a perfectly upright straight stem free from side branches, well furnished all the way with leaves; and the plume of flowers large, erect, close, and regular, without any side-shoots or smaller heads.

The other four species of this genus, though not so generally known and esteemed as the Cock's-Comb kind, however, are very showy plants, and form an elegant variety among

the Combs and other curious annuals; and one method of culture brings them all to perfection.

All the five species are herbaceous, and of the annual tribe, exotics of most delicate temperature, being natives of the hot parts of Asia and America, and, in their culture here, require to be raised and forwarded in at least two or three different hot-beds from March till June or July; that is, raising them from seed in one in March, pricking them out into another in April, and to have them very fine, transplant them into a third in May, to remain until the middle or end of June or beginning of July, when they will have attained nearly their full stature, with their flower-heads in tolerable perfection, and the weather will then be settled and warm, and should be placed abroad, where their heads will continue their full lustre till October, at which time they ripen seeds, then gradually decay, and November cold puts a total period to their existence; so that a fresh supply must be annually raised from seed in spring.

All the sorts are generally planted in pots, particularly the Cock's-Combs, to arrange in fore courts, or to move to any place where a grand shew is at any time occasionally wanted; but, if required, some may also be raised for the borders, without employing so much nicety in their culture as those you intend to pot for the grand shew; but even in this case two different hot-beds are requisite, raising them in one, and pricking them out into another, to remain till June.

Propagation, General Culture, &c.

As before observed, all the sorts are raised from seeds annually in hot-beds under frames and glasses; and the proper time to sow them is the beginning or middle of March; and one general method is applicable to the whole.

Observe also, as already hinted, that, to have the large sorts as fine as possible, three different hot-beds are necessary in their culture; that is, a small one in March, wherein to sow the seed and raise the plants an inch or two high; a second in April of larger dimensions, in which to prick the plants three or four inches distance; and a third in May for a large frame, to receive them transplanted into pots, to remain until the end of June or beginning of July to grow to full size; all of which hot-beds must be covered with frames and glasses, and have five or six inches depth of fine rich light earth for the reception of the seed and plants; and in the second and third hot-bed the frames must be occasionally raised or augmented in depth according as the plants shall rise in height, which is to be particularly

particularly attended to in the Giant Cock's-Comb.

Therefore, whoever intends the culture of these plants, ought to be well furnished with hot dung, and different sized frames and glass lights. See ANNUAL PLANTS.

The first hot-bed in March, for the reception of the seed and raising the plants an inch or two high, need not be larger than for a one or two-light frame, which will raise a due quantity of these and other similar tender, curious annuals for furnishing any private garden, observing to make the bed two feet and half depth of dung, and directly put on the frame and glass or glasses, and in four or five days, when the rank steam and first violent heat abates, put on the mould, which must be light, rich, and dry, laying it four or five inches thick; then either sow the seed on the surface, and cover it half a quarter of an inch deep; or draw very shallow drills with the finger, sow it therein, covering it the same depth; this done, immediately put on the glasses again, and tilt them a little in the middle of mild days for the evaporation of the steam, &c. the plants will appear in a few days, when air must be judiciously admitted by tilting the upper end of the lights an inch or two high every mild calm day; and when the earth appears dry, give very light sprinklings of water in sunny weather; keep the glasses close on nights, and continue to cover them at the same time with mats to remain till morning; and in this manner continue the care of the plants till large enough to be pricked into another hot-bed, which will be in about three weeks.

About the middle of April therefore, or a little before or after, when the plants are an inch or two high in the seed-bed, another hot-bed for a two or three light frame must be got ready to prick them in, as just hinted; make this bed also about two feet six inches, or a yard thick of dung, place the frame and glasses thereon; and when the burning quality of the bed subsides, mould it five or six inches deep, and next day, when the bed has imparted a due warmth to the mould, raise the plants with care from the seed-bed, and prick them in this, four or five inches distance; give a very light sprinkling of water, and directly put on the lights, and give occasional shade in sunny days till the plants are rooted, observing to admit fresh air every fine day, as above; give also occasional very light waterings every two or three days, and defend the glasses on nights with mats, as before advised; and, according as the plants advance in height, raise the frame a little in proportion: here

they may grow a month or five weeks, by which time they will meet, when they must be moved into a third and final hot-bed, previously planting some of the best singly in pots, as hereafter directed.

Their second removal will be necessary towards the middle of May, or when the plants in the above second bed are so much advanced as to press against each other, when a third and final hot-bed should be made for one or more of the largest frames, to receive the plants in pots, observing, if you raise principally the Dwarf sorts, one of the deepest common garden-frames may be sufficient, with a little occasional raising at bottom; but for the Giant sorts, which ought to be drawn up at least three or four feet high, a deep drawing-frame, or a multiplying drawing-frame of two or three divisions, so as the depth can be occasionally augmented, is necessary; or, in default thereof, any common frame, raised occasionally upon four posts, as intimated under the article ANNUAL PLANTS; and for the more commodiously using these drawing-frames for the tall Cock's-Combs, the hot-bed should be sunk eighteen inches in the ground, by making it in a trench that depth; but where there is a glass-case calculated on purpose for drawing curious annuals, this third hot-bed for the tall sorts should be made in that department (See ANNUAL PLANTS). Let the hot-bed in either method be two feet six inches at least depth of dung, which, when of due temperature, earth five or six inches thick, and next day proceed to put in the plants, observing, that such as you intend for pots, both of the Dwarf and Giant kinds, should now be potted, and the pots called twenty-fours are the proper size, one plant to each pot, being careful to take up the plants out of their present bed with a garden trowel, so as to preserve a ball of earth to the roots of each plant; place one in each pot with the ball entire, and fill up round the ball with more rich earth; give some water, and directly plunge the pots to their rims in the earth of the bed, placing them close together every way; at the same time let all the cavities between be closely filled with mould, that the steam may nowhere arise immediately from the dung, which would attack and destroy the leaves of the plants. The plants being thus all potted and plunged, put the glasses immediately on the frame, and shut them down close to draw up the heat, but raising them a little the next, and every succeeding day, that the steam may pass off: be now careful to shade the glasses in the middle of sunny days for the greatest part.

part of the first week till the plants have taken good root; fresh air during their residence here must also be daily admitted, by tilting one or both ends of the lights more or less, in fine weather, in proportion to the advanced growth of the plants; water must likewise be afforded them twice a week, or oftener, when the weather is very hot and sunny; and every night continue to protect them from cold by shutting the glasses close, and cover them with mats; attention must also be had to maintain a constant moderate temperature of heat in the bed, by occasional moderate linings of hot dung to its sides; and by observing this, together with a proportionable supply of fresh air and moisture, the plants will now make great progress, and their heads will increase considerably in magnitude.

Likewise observe, according as the plants of the large sorts advance in stature, to afford them due scope to shoot, by augmenting the depth of the frame by some of the methods above observed, and as explained in the article ANNUAL PLANTS.

With regard to the Dwarf sorts, if designed to have them in their natural dwarfish growth, they must not be drawn in deep frames, &c. like the others; so that the frame containing them need be only a little raised by degrees at bottom, continuing the glasses always near the heads of the plants, to prevent their drawing up too much to stem, which, being contrary to their natural growth, would render them weak, and their heads would be but of inconsiderable size.

Towards the middle or latter end of June the plants in general will be well advanced in growth, and the weather well settled and warm, when it is proper to begin to harden them gradually to the full air, by raising the glasses every day more and more at each end on props, and by degrees take them wholly off, and towards the latter end of June, or in the first week in July, remove the plants in their pots fully abroad, where they are finally to remain; at the same time let each of the tall sorts be supported with a straight, firm, handsome stake, tying the stem of the plant thereto in three different places.

When placed in the open air, by no means neglect watering them in dry weather, which when very hot and sunny, the waterings should be repeated every day; for, if not duly supplied with this article, the leaves will shrink, and the heads of the flowers become irregular.

When designed to raise any of these plants for the borders, sow the seed as before directed, in the middle or latter end of March, and

towards the end of April, or beginning of May, prick the plants in a fresh hot-bed six or eight inches distance, managing them as already directed until the middle of June; then transplant them, with balls of earth to their roots, in the borders, &c. but these will not be near so fine as those forwarded by the methods before directed.

All the sorts perfect their seeds in September and October, when great care is necessary to save it only from the most perfect heads; and be particularly careful to preserve the Dwarf and Giant sorts of the Cock's-Comb kinds separate; observing likewise, if very wet or cold weather prevail at this time, the plants should be placed in a deep or raised frame, for the heads to have occasional shelter of the glasses from excessive rains.

CELSIA.

A genus of didynamious plants, one of which, a curious, under-shrubby, evergreen, perennial exotic, of the ornamental flowering kind, is retained for the green-house or stove collection.

Class and order, *Didynamia Angiospermia*.

Characters.] CALYX, small, monophyllous, acutely five-parted, and permanent. COROLLA, monopetalous and rotated, with a very short tube and brim plane, semiquinifid and unequal. STAMINA, two long and two short filaments, with roundish antheræ. PISTILLUM, a roundish germen, style slender, of the length of the stamina, topped with a blunt stigma. PERICARPIUM, a roundish capsule, compressed at the top and inserted in the cup, having two cells containing many small angulated seeds.

There are several species, annual or biennial, but only one comes within our notice, viz.

CELSIA *linearis*.

Linear-leaved Peruvian Celsia.] Celsia with a slender, under-shrubby, perennial stalk, and many spreading branches, growing two or three feet high; lanceolate-linear dentated leaves by threes at each joint; and axillary peduncles, each sustaining one bright scarlet flower.

This is an elegant perennial plant: its principal leaves, which are between two and three inches long, and evergreen, grow three at a joint, have several others of a less size coming out of their bosoms; the flowers grow in a spike; when they are expanded, the lower part of the corolla appears deficient; it is of a rich scarlet colour, and succeeded by capsules filled with seeds.

This Celsia being a native of a warm climate, it blossoms best in a moderate stove, but will

will succeed in a green-house, where it may in common be kept.

Its propagation is by seeds or cuttings; the seeds may be sown in the spring in pots in a common hot-bed, and afterwards planted out singly, also by cuttings of the young shoots planted in pots of rich earth and plunged in the bark-bed, shading them and giving moderate waterings, will soon strike root and become new plants.

CELTIS, the Lote, or Nettle-tree.

There are three species, all of them hardy deciduous trees, with very branchy diffused heads, garnished with simple, oblong, deeply sawed, alternate leaves, somewhat resembling those of the common stinging-nettle; and all three species are proper for ornamental plantations, and two of them also as forest-trees.

Class and order, *Polygamia Monœcia*.

Characters.] Calyx, hermaphrodite and male florets, having monophyllous, five-parted cups in the former, and in the males, six-parted. COROLLA, no petals. STAMINA, five short filaments in the hermaphrodite florets, six in the males, and quadrangular four-furrowed antheræ. PISTILLUM, an oval germen, two reflexed styles, and single stigmas. PERICARPIUM, a roundish unilocular berry, containing a small roundish nut.

The species are,

1. CELTIS *Australis*.

South-European Black-fruited Nettle-tree.]

Celtis with an upright large stem and very branchy head, rising forty or fifty feet high, garnished with large, ovate-spear-shaped, pointed, serrated leaves, and greenish flowers from the sides of the branches in May, succeeded by round black fruit the size of small black-berries.

2. CELTIS *occidentalis*.

Occidental, or American Purple-fruited Nettle-tree.]

Celtis with an upright large stem, and very branchy spreading head, growing forty or fifty feet high; large, ovate-lanceolate, sharp-pointed, deeply-sawed, oblique leaves; and greenish flowers from the sides of the branches in May, succeeded by purple fruit the size of large peas.

3. CELTIS *orientalis*.

Eastern Yellow-fruited Nettle-tree.]

Celtis with an upright stem, dividing into many spreading greenish branches ten or twelve feet high; small, oblong-heart-shaped, serrated, oblique leaves; and yellowish flowers from the sides of the branches in spring, succeeded by large, oval, yellow fruit.

Varieties.] Of each sort there are varieties with bleached leaves.

The flowers of all these trees are herma-

phrodites, and males on the same plant; but those of both sexes being devoid of petals, make no ornamental appearance, and the hermaphrodites only succeed to fruit, which, in favourable autumns, ripens tolerably well in England.

All the three species are deciduous, and of temperature hardy enough to prosper here in any exposure and soil, in common with other hardy trees and shrubs.

For purposes in gardening, they are well calculated for all ornamental plantations, being finely clothed with leaves of a delightful green, which continue their verdure in a singular manner to the very last, not like most other trees of the deciduous race, whose leaves discover their approaching decay by their gradual change of colour; but these exhibit themselves a beautiful green till November, and even till their fall, about the middle or end of that month; so that they are peculiarly well adapted for plantations, on the boundaries of spacious lawns, grand wilderness-works, and for the most conspicuous parts of parks, either placed in clumps, or as single objects.

The first and second sorts may also be employed as forest-trees in any economical plantation; for they are of free growth, and their wood being tough and pliable, is valuable for various uses.

Propagation.

The propagation of all the sorts is effected by seeds, either of English or foreign growth, which may be had of the seedsmen, and which grow freely in the full ground.

The bleached-leaved kinds, however, can only be continued by layers, cuttings, or by grafting, &c.

The seeds of the others may be sown in autumn or spring; but by sowing in autumn soon after the seeds are ripe, they commonly rise freely the following spring; and the spring-sown seeds often rise straggling, and sometimes remain a whole year before they germinate: let the seeds, however, be sown as soon as they can be procured, either in pots, boxes, or in a warm rich border, covering them half an inch deep. When the plants appear, if cold nights prevail, afford them occasional shelter of mats; and in dry hot weather, while the plants are very small, shade in the middle of parching sunny days will be serviceable; likewise encourage them during summer by frequent waterings. In autumn and winter protect them from frost by occasional coverings, as above; and in the end of March, or in April, when of one or two years' growth, prick them out from the

seed-bed into another, in a sheltered situation, placing the plants in rows a foot asunder; after this they require no farther care than occasional weeding, and in two, three, or four years they will be ready for the shrubbery or other plantations.

If you at any time sow these seeds in spring, let it be in large pots, or in boxes, &c. and if the plants do not appear, remove them to the shade in summer, and shelter of a frame, warm wall, or hedge in winter, to stand till spring; at which time, if you plunge them in a hot-bed, it will bring up the plants quickly, and greatly forward them: the same may be practised to such as are sown in pots in autumn.

CENTAUREA, Centaury, Cyanus, Blue-Bottle, &c.

This genus is very extensive in herbaceous annuals, biennials, and perennials, to the amount of above seventy species, mostly of upright growth, from one to five or six feet stature, dividing into branches, crowned by scaly heads of compound flowers.

A few of them are ornamental plants, and some proper for medicine; but far the greater part are plants of little or no merit for garden culture.

Class and order, *Syngenesia Polygamia Frustanea*.

Characters.] **CALYX**, compound radiated flower, having a roundish scaly empalement. **COROLLA**, the disc composed of many hermaphrodite fruitful florets, tubular below, swelled and five parted at top; and in the radius, composed of neuter or barren florets, tubular, and gradually enlarging, and unequally divided, above. **STAMINA**, five short hairy filaments, and cylindric antheræ. **PISTILLUM**, a small germen, slender style, and blunt stigma. **PERICARPIUM**, none; the seeds lodge in the calyx.

The species that merit culture are as follow: the first five are very hardy perennials, abiding in root, but annual in stalk, &c.

1. **CENTAUREA Centaurium.**

(*Centaurium*)—or *Greater Purple Centaury*.] Centaury with a strong perennial root, crowned by many winged very long leaves, spreading flat every way; upright branching stalks five or six feet high; a small winged leaf at each joint, and all the branches terminated by a single head of purple flowers in smooth cups.

2. **CENTAUREA glassifolia.**

Wood-leaved Great Yellow Centaury.] Centaury with a penetrating perennial root, crowned by many long, entire, erect leaves; several upright stalks four or five feet high, having a single decurrent leaf at each joint;

and all the stalks terminated by a single head of yellow flowers in scaly silvery cups.

3. **CENTAUREA Stæbe.**

Hoary Stæbe of Austria.] Centaury with a perennial root, crowned by many pinnatifid hoary leaves of many narrow, entire segments; upright, branchy stalks a yard high, a winged leaf at each joint, and each branch topped by a head of purple flowers in oblong ciliated cups.

4. **CENTAUREA orientalis.**

Oriental Centaury, or Great Yellow Knapweed of Siberia.] Centaury with perennial roots, crowned by pinnatifid very long leaves of many spear-shaped lobes; upright very branchy stalks five feet high, garnished with small pinnatifid leaves; and all the branches terminated each by a large single head of yellow flowers in ciliated cups.

5. **CENTAUREA montana.**

Mountain Perennial Blue-Bottle, or Blue Bachelor's-Button.] Centaury with very creeping perennial roots; many upright single stalks a foot and half high, garnished with spear-shaped, hoary, decurrent leaves; and all the stalks crowned each by a large, oblong head of blue flowers in serrated cups.

Varieties.] Broad-leaved Perennial Blue-Bottle—Narrow-leaved Perennial Blue-Bottle—Dwarf Perennial Blue-Bottle.

The three following are perennial in root, stalks, and leaves; are rather impatient of severe frost, but will live in the full air in a dry sheltered situation.

6. **CENTAUREA ragusina.**

Ragusian Silvery Knapweed, or Cynara-leaved Centaury.] Centaury with a perennial root, upright, branchy, perennial stalks a yard high; large, pinnatifid, white, downy leaves, of many oval, obtuse lobes, the exterior ones the largest; and all the branches adorned with heads of bright yellow flowers, in June, in ciliated hairy cups.

7. **CENTAUREA cineraria.**

White Italian Knapweed.] Centaury with perennial roots; upright, branchy, perennial stalks, near a yard high; pinnatifid, very white, downy leaves, of many narrow acute segments; and every branch crowned by a head of purple flowers in ciliated cups.

8. **CENTAUREA argentea.**

Silvery Centaury of Candia.] Centaury with perennial roots, crowned with pinnatifid very tomentose white leaves, upright, tomentose stems three feet high; garnished with simple, wedge-formed, white leaves, and terminated by large yellow flowers.

The three following are hardy annuals.

9. **CENTAUREA Cyanus.**

(*Cyanus*)

(*Cyanus*)—or *Annual Blue-Bottle*, or *Bottles of all colours*.] Centaury with annual roots; upright, branchy stalks two or three feet high; narrow leaves, the lower ones indented, those above very narrow and entire; and the stalks and branches terminated by scaly heads of flowers of various colours in the different varieties.

Varieties.] Common Blue Bottle with blue flowers—blue and white flowers—purple flowers—purple and white flowers—flesh-coloured flowers—flesh-coloured and white flowers—violet-coloured flowers—violet and white flowers—red flowers—double blue flowers—double purple flowers—double purple and white flowers.

10. *CENTAUREA moschata*.

Musk-scented Oriental Cyanus, or Sweet Sultan.] Centaury with annual roots; an upright, channelled, branchy stalk, a yard high, garnished with jagged, smooth, close-fitting leaves; and from the sides of the branches many long, erect, naked foot-stalks, each supporting a single head of odoriferous flowers in round, scaly, smooth cups.

Varieties.] Sweet Sultan with purple flowers—with white flowers—with flesh-coloured flowers—with purple fistulous flowers—white fistulous flowers—with fringed flowers—*Amberboi*, or Yellow Sultan, having sawed leaves, and bright yellow fistular flowers.

11. *CENTAUREA benedicta*.

Carduus Benedictus, or Blessed Thistle.] Centaury with annual roots; very branching, hairy, reddish stalks, near two feet high; long, deeply-sinuated, hairy, decurrent leaves, having the segments ending in spines; and the ends of the branches crowned by heads of pale-yellow flowers in oval, scaly, doubly-tipinous cups.

The flowers of all the species and respective varieties are compound and radiated; that is, each flower is of many florets, in the centre and circumference, contained in one scaly general cup. See the *Characters*.

They all flower in June, July, and August, and mostly ripen seeds in England.

All the species, except the *Carduus Benedictus*, may be employed as ornamental plants in the common ground, where, though we have many plants of more showy appearance, they will effect an agreeable variety.

As to the perennial species, the first five are proper furniture for the compartments of extensive gardens, where many large plants of free growth and easy culture are required, as they will succeed in any common exposure and soil where moisture is not too copious. The sixth, seventh, and eighth species are rather

tender, so should have a perfectly dry soil and sheltered situation, otherwise will be in danger of suffering in severe winters: and a plant or two of each of these three sorts may also be potted to move to occasional shelter from frost; for, as they retain their white hoary leaves all the year, they make a pretty variety in a garden.

The annual sorts, *Centaurea Cyanus*, and *Centaurea moschata*, are pretty ornaments for the borders of the pleasure-ground. The first of these annuals grows naturally in our corn-fields, particularly the common blue sort, but which, and its numerous varieties, have also been long inhabitants of gardens, and are all very hardy, rising from seed freely in the open borders; but the other sort and varieties are natives of the East, from whence they have been long introduced into the European gardens for the beauty of their flowers, which continue in succession from June till October: the plants being somewhat tender, require to be raised in a hot-bed in spring, and planted out in May, though they will rise in a warm border in April; but these will not flower so soon as those raised in a hot-bed: the *Amberboi*, or Yellow Sultan, in particular, requires that assistance.

The tenth sort, *Centaurea Benedicta*, or *Carduus*, is considered principally as a medical herb, and its emetic property is well known.

Propagation of all the Sorts.

All the perennial sorts are propagated by seeds and parting their roots, and the sixth, seventh, and eighth sorts also by slips or cuttings of their stalks and branches in young shoots.

Sow the seeds of all the sorts in a bed or border of common earth in March; keep the plants clean from weeds, thin them where too thick, and in autumn following transplant them into the places of their final destination.

By slipping the roots:—it may be done any time in open weather from October till March or April.

Cuttings or slips of the young side-branches of the sixth, seventh, and eighth sorts, planted in a shady border in May, June, or July, will readily grow.

The annual sorts are raised from seed annually in the spring.

The *Centaurea Cyanus*, or Blue-Bottle, and varieties, may be sown in the borders in patches, in the places where they are to flower, sowing several seeds in each patch half an inch deep.

The *Centaurea moschata*, or Sweet Sultans,

will also rise from seed in the common ground, sowing it in March or April, either in the places where they are to flower, as directed for the Blue-Bottles, or in a warm border under hand or bell-glasses, or without, and plant them out in May or June into different parts of the borders; but if the seeds are sown in a hot-bed at the above time, it will forward the plants for transplanting in May, and they will flower near a month sooner than the others. The Yellow Sultan in particular, being rather a little tender, should be principally raised in a hot-bed; and if pricked on another in April or beginning of May, it will forward them greatly; and about the end of that month, or beginning of June, transplant them finally with balls to their roots, placing some in pots, and some in the borders.

However both these sorts of Sultan flowers may be sown in April in the open borders, and they will come up and flower plentifully in autumn; and if the seeds of the common Sultans are sown in autumn, soon after they ripen, in a warm border, the plants will come up, stand the winter, and flower the summer following sooner by a month than the spring-sown plants.

The *Carduus* may be sown in autumn or spring in the common ground; by sowing in autumn the plants stand the winter, grow stronger, and will be fit for use sooner than the spring plants. The seed may either be sown in shallow drills a foot asunder, and when the plants come up, thin them to eight inches distance; or sow the seed promiscuously on the surface, and rake it in, thinning the plants as above; or may be sown thick, and the plants afterwards transplanted the above distance: they will shoot up to stalk in May or June, and flower in July, at which period they are in perfection to cut for use, cutting the stalks close to the bottom; and after drying in the shade a few days, bunch them for use.

CEPHALANTHUS, Button-tree, so called from its mode of flowering.

There is but one species generally known in our gardens, a hardy, deciduous, flowering shrub, of American growth, garnished with simple, oblong leaves, and small globular heads of flowers, and is very ornamental for the shrubbery.

Class and order, *Tetrandria Monogynia*.

Characters.] **CALYX**, aggregate flowers, each floret having a monophyllous, funnel-shaped, quadrifid cup. **COROLLA**, many monopetalous, infundibuliform, acute florets, collected into a round head. **STAMINA**, four short filaments inserted into the petal, and globose antheræ. **PISTILLUM**, a germen

under each floret, short style, and globular stigma. **PERICARPIUM**, none. **SEMINA**, pyramidal, solitary seeds, placed on a globose, hairy receptacle.

The species is,

CEPHALANTHUS occidentalis.

Occidental Cephalanthus, or Button-tree.]

Cephalanthus with a branchy stem six or seven feet high, branching in pairs; oblong leaves by pairs and threes, having a strong longitudinal nerve, and small ones transversely; and all the branches terminated by aggregate yellowish flowers in globular heads the size of gooseberries, each aggregate composed of many funnel-shaped florets affixed to an axis in the middle.

It flowers here in July, but rarely ripens seeds in England.

This shrub deserves a place in every collection, and prospers in any common soil; but delights most in somewhat moist ground.

The propagation of this shrub is by seed in the full ground, or in pots or boxes, to move to occasional shade or shelter; likewise by layers and cuttings.

The seeds are obtained from America, and may be had of the seedsmen, which should be sown as soon as they arrive, near half an inch deep, and probably the plants will rise the first spring, though, if sown late, they sometimes do not appear till spring following; when this is the case, keep the earth free from weeds, giving occasional shade in very hot weather, and some protection from severe frost, and in spring after the plants will rise in great plenty: these, the first summer, should be frequently watered in dry weather; and when the seedlings are of one or two years' growth in the seed-bed, or according to their strength, they should be transplanted in autumn or spring, into nursery-lines: and in two or three years more they will be fit for the shrubbery.

By layers and cuttings:—the young wood, if layed in autumn, will be rooted and fit to transplant by that time twelvemonth; and cuttings of the young shoots, planted at the same season, or in the spring, in a moist, shady border, will grow.

CERASTIUM, Mouse-ear Chickweed.

It consists of several low herbaceous plants, mostly trailers, garnished with small simple leaves, and quinquepetalous white flowers, esteemed as furniture for the pleasure-ground.

Class and order, *Decandria Pentagynia*.

Characters.] **CALYX**, a pentaphyllous, spreading cup. **COROLLA**, five obtuse, bifid, patent petals. **STAMINA**, ten filaments, alternately shorter, and roundish antheræ.

PISTIL-

PISTILLUM, an oval germen, five capillary styles, and obtuse stigmas. **PERICARPIUM** is either an oval, cylindrical, or globular, unilocular capsule, and many roundish seeds.

The species cultivated in our gardens are,

1. **CERASTIUM repens.**

Creeping, Hoary Ceraſtium.] Ceraſtium with creeping, perennial roots; many slender, trailing, branchy, perennial ſtalks, rooting at the joints, garniſhed with ſpear-shaped, hoary leaves in pairs oppoſite; and numerous branchy peduncles, each ſupporting one white flower, ſucceeded by roundiſh capsules.

2. **CERASTIUM tomentosum.**

Downy-leaved Ceraſtium.] Ceraſtium with perennial roots; many trailing, branchy, rooting, perennial ſtalks; oblong, narrow, very downy, white leaves; and many branching peduncles, terminated by white flowers, ſucceeded by globular capsules.

The flowers of both ſorts are compoſed of five ſmall petals, and being numerous on the plants, are very conſpicuous, appearing in May and June.

The plants are hardy, and proſper any where; are principally natives of diſtant countries in rocky and dry waſtes, and being of ſpreading growth, are retained in our gardens to run over naked banks, and other ſimilar compartments, and to decorate artificial rock-work, ruins, grottos, &c. or other parts, as may be required; and will multiply exceedingly, by their trailing ſtalks rooting, as they advance, at every joint.

Their propagation is effected with the utmoſt facility, either by ſeeds, or ſlipping their rooting branches, or parting their roots; all of which may be performed either in autumn or ſpring.

CERASUS, the Cherry-tree. See **PRUNUS**.

CERATONIA, the Carob-tree, or St. John's Bread, or *Silqua*.

It is a large, evergreen, exotic ſhrub of the green-houſe, adorned with pinnated leaves, and ſmall apetalous flowers.

Class and order, *Polygamia Triœcia*.

Characters.] **CALYX**, androgynous, and male and female flowers on three diſtinct plants, having large, five-parted cups. **COROLLA**, no petals. **STAMINA**, five long, ſubulate filaments, crowned with large didymous antheræ. **PISTILLUM**, females, a germen, contained within a fleſhy receptacle, long filiform ſtyle, and capitated ſtigma. **PERICARPIUM**, females, a large, obtuſe, compreſſed, coriaceous, leguminous pod, divided by many tranſverſe partitions, the diviſions filled with pulp, and have each one

roundiſh, hard ſeed, lodged in the pulpy ſubſtance.

There is but one ſpecies, viz.

CERATONIA Silqua.

(Silqua edulis)—*Carob-tree, or St. John's-bread.*] Ceratonia with an upright, woody, thick ſtem, dividing into a branchy head, growing fifteen or twenty feet high, decorated with long pinnated leaves, compoſed of ſeveral large, roundiſh-oblong, thick, firm, duſky-green, entire lobes, and ſmall, apetalous, purple flowers, ſucceeded by large, obtuſe, fleſhy, compreſſed ſeed-pods, containing ſeveral ſeeds in a ſoft pulp; but not produced in this country.

This tree being a native of Paleſtine, and the ſouthern warm parts of Europe, in this country requires ſhelter in winter, ſo muſt generally be kept in pots, and placed in the green-houſe collection, or ſometimes is planted againſt a warm ſouth-wall, and defended occaſionally in ſevere weather with garden-mats, &c.

From this tree growing naturally in Paleſtine, and the notion of the pulpy pods affording aliment to John the Baptiſt, it obtained the old name of St. John's-bread.

It is propagated by ſeeds procured from Italy, which ſow in pots in the ſpring, plunging them in a hot-bed; and when the plants are three inches high, prick them in ſeparate ſmall pots, continuing them alſo in a hot-bed, and afford them occaſional ſhade, water, and freſh air, to which harden them gradually in June, and in July remove them abroad to a ſheltered place till October; then place them in the green-houſe, treating them as other ſhrubs of that department.

CERCIS, Judas-tree, (*Arbor Judæ.*)

This genus furniſhes two hardy, deciduous, ornamental trees, of moderate ſtature, adorned with heart-shaped leaves, and cluſters of pentapetalous papilionaceous-like flowers.

Class and order, *Dicandria Monogynia*.

Characters.] **CALYX**, a monophyllous quinqueſtoothed cup, convex at bottom. **COROLLA**, five petals, reſembling a papilionaceous flower; two of the petals are reflexed and form the wings, a roundiſh one the ſtandard, and three, in form of a heart, form the carina, and ſurround the fructification. **STAMINA**, ten diſtinct declinated filaments, four of them longer than the reſt, and oblong, incumbent antheræ. **PISTILLUM**, a narrow, lanceolate, pedicellated germen, ſlender ſtyle, and obtuſe ſtigma. **PERICARPIUM**, an oblong, oblique-pointed, leguminous pod of one cell, and roundiſh ſeeds.

The

The species are,

1. *CERCIS Siliquastrum*.

(*Siliquastrum*)—or *Common European Judas-tree*] *Cercis* with an upright trunk, dividing into an irregular branching head, from ten to twenty feet high, garnished with roundish-heart-shaped, smooth leaves, on long foot-stalks, and purple flowers in large clusters, from every side of the branches, succeeded by long, flat pods.

Varieties.] With flesh-coloured flowers—with white-flowers—with broad pods.

2. *CERCIS canadensis*.

Canadian Downy-leaved Judas-tree.] *Cercis* with an upright stem, branching irregularly, from ten to fifteen feet high; heart-shaped, downy, alternate leaves; and reddish flowers in clusters from the sides of the branches, succeeded by long pods.

The flowers of both these species are very numerous, and make a fine ornamental appearance in April or May, coming out with the leaves, surrounding the branches in clusters, and are often succeeded here by pods and ripe seed.

Both the sorts are deciduous, and of hardy temperament.

They are choice furniture as flowering shrubs for any ornamental plantation; they are not only beautiful in their numerous early flowers, but the singularity of their leaves forms a fine variety, in assemblage with other trees and shrubs of similar growth; so should never be omitted in a collection, particularly for the most conspicuous shrubbery compartments.

Their propagation is principally by seed; for they do not succeed so well by layers or cuttings. Sow the seed in March in a bed of common earth, covering it half an inch deep; the plants will appear, probably some the same year, and the rest not till the following spring, so that the bed should not be disturbed till all are come up, being careful to clear out weeds, and give occasional waterings in summer; and in winter the shelter of mats, &c. in very severe weather, will greatly protect the tender tops of the seedlings, which in March following transplant in nursery rows a foot apart, allowing two feet between the rows, and in about three years they will be of due size for the shrubbery.

CERINTHE, Honeywort.

This genus furnishes two species of hardy, ornamental, flowering, annual-biennial plants, for adorning the flower borders, &c. growing a foot and a half to two feet high, garnished with obtuse, glaucous leaves, and long, hang-

ing, peduncled, monopetalous, bell-shaped, purple and yellow flowers.

Class and order, *Pentandria Monogynia*.

Characters.] CALYX, five-parted into oblong, equal divisions, and permanent. COROLLA, monopetalous, bell-shaped, with a short, thick tube, the border bellied, five-parted at the rim. STAMINA, five very short tubulate filaments, with acute, erect antheræ. PISTILLUM, a four-parted germen, slender style, and obtuse stigma. PERICARPIUM, none. SEMEN, two subovate seeds, lodged in the permanent calyx.

The species are,

1. *CERINTHE major*.

Greater Purple Honeywort.] *Cerinthe* with upright, branchy, leafy stalks, growing half a yard to two feet high; leaves oblong, obtuse, glaucous, embracing the stalks; and nodding leafy branches, producing long peduncles, terminated by the flowers hanging down among the leaves, with the corolla bluntish, spreading: flowering in June, July, and August, succeeded by plenty of ripe seed in autumn.

Varieties.] Greater Honeywort, with smooth leaves, and purple flowers—with prickly leaves, and yellow flowers.

2. *CERINTHE minor*.

Smaller Yellow Honeywort.] *Cerinthe* with upright, smooth stalks, fifteen or eighteen inches high; obovate-obtuse, smooth, entire leaves, glaucous underneath, embracing the stalks; and solitary, yellow flowers at the axillas, hanging down on long peduncles; having the corollas acute, closed; flowering in June, July, till September, succeeded by ripe seed in autumn.

Both these species of *Cerinthe* are natives of Italy, Germany, &c. but hardy, to grow freely here in the open air all the year; are annual-biennial, very ornamental, flowery plants, to introduce for decorating the common flower borders, &c. in which they will flower abundantly, great part of summer.

The flowers of these plants abounding in a honey juice in the tube of the corolla, hence the name Honeywort.

They may be considered both as annual and biennial, as, when sown in spring, they flower the same year in summer or autumn, and often decay wholly in winter; but when sown in the autumn, or as soon as the seeds are ripe, the plants come up the same season, stand the winter, and flower earlier next summer, and sometimes continue longer; and from the scattered or self-sown seeds, disseminated from the flowering plants on the adjacent

cent ground, young ones rise naturally without trouble, though it is generally advisable to raise a supply of plants by regular culture of sowing.

They are propagated and raised from seed annually in the spring or autumn, sown either generally in the borders, in patches where the plants are to remain for flowering, as directed under the article ANNUAL PLANTS, and managed in the same manner as there directed for Hardy Annuals; or occasionally sown in a bed for transplanting: observing that when intending to sow any in autumn, it should generally be performed soon after the seeds ripen in August or beginning of September; and the plants will most probably come up the same season, continue all winter, and flower early the ensuing summer; or the spring sowings of March or April will come into flower the same year, towards autumn, and continue till October.

CESTRUM, Bastard Jasmine, or *Jasminoides*.

It retains some shrubby, evergreen exotics for the stove, six or eight feet high, adorned with simple, oblong, thick leaves three or four inches long, and monopetalous funnel-shaped flowers in clusters.

Class and order, *Pentandria Monogynia*.

Characters.] **CALYX**, a monophyllous, short, tubular, quinque-dentate cup. **COROLLA**, one funnel-shaped petal, with a long cylindrical tube, spreading above, and divided into five oval segments. **STAMINA**, five filaments adhering to the tube, and roundish tetragonous antheræ. **PISTILLUM**, a cylindrical-ovate germen, slender style, and thick, obtuse stigma. **PERICARPIUM**, an ovate, unilocular berry, having many roundish seeds.

The species are,

1. **CESTRUM nocturnum**.

Night-smelling Cestrum.] Cestrum with an upright, woody stem, dividing upward into a branchy head, six or eight feet high; longish, smooth, firm leaves, veined underneath, and placed alternate; and greenish-yellow flowers in small clusters, on foot-stalks, from the sides of the branches.

2. **CESTRUM diurnum**.

Day-smelling Cestrum.] Cestrum with an upright, woody stem, dividing upward into a very branchy head, rising eight or ten feet high; oblong, smooth, thick, firm leaves, placed alternate; and clusters of whitish flowers, sitting close to the branches.

Both these species being natives of the hot parts of America, in this country are retained in stoves.

They are evergreen, and form a pretty variety in large stoves; both sorts flower here annually, and have the appellation of Night-smelling, and Day-smelling, from the remarkable strong fragrance of their flowers respectively at those times.

They must be kept in pots of light, fresh earth, watered frequently in summer, but moderately in winter.

Both sorts may be propagated by seed and cuttings, by the assistance of artificial heat; but as seeds are with difficulty procured, you may plant cuttings of the side shoots five or six inches long, in pots of light earth, any time in summer, plunging the pots in the bark-bed, and give occasional shade and water.

CHAMÆROPS, Dwarf Palm, or *Palmetto*.

It consists of one species, an acaulous perennial exotic, with large, palmated, fan-shaped leaves, and spathaceous flowers; a native of Spain, and retained here in our stoves for variety.

Class and order, *Polygamia Diœcia*.

Characters.] **CALYX**, male and hermaphrodite flowers on distinct plants, having a compressed spatha, protruding a branching spadix of many florets, each having a triphyllous or tripartite cup. **COROLLA**, a branching spadix of many erect florets, each divided into three inflexed parts. **STAMINA**, six compressed filaments, and narrow twin antheræ. **PISTILLUM**, three roundish gemina, and three permanent styles, and acute stigmas. **PERICARPIUM**, three unilocular berries, each having a single seed.

The species is,

CHAMÆROPS humilis.

Dwarf Palm, or Palmetto.] Chamærops with a spreading root, sending up frondose, spinous foot-stalks, elevating at top large palmated, folded leaves, from ten to eighteen inches long, and near a foot broad, of many foldings, opening like a fan, and divided at top like the fingers of a hand; and between the leaves rises a spatha, protruding a branching spadix of flowers.

This plant rather requires protection of a stove while young; but when older, it will prosper in the full air in summer, and in a green-house in winter, and must always be kept in pots of light, sandy earth, frequently watered in summer, but moderately in cold weather.

It may be propagated by seeds, and by side-slips from the head of the root. The seeds are procured from abroad, which sow in pots of light, sandy earth, and plunge them in a hot-bed,

bed, giving occasional waterings; and by autumn or spring following, the plants will be fit to be pricked in separate pots.

By slips:—the crown of the roots sometimes affords side off-sets, which, if separated with fibres, planted in pots, and plunged in a hot-bed, will readily grow.

CHARACTERS. The description or general character of every genus of plants, drawn from the fructification, or all the parts of the flower.

The term *Character* is applied only in describing the *genera*, and extended to the *species*, so far as that all those of the same genus, or family, bear invariably the same characteristic distinction in all parts of the flower; that of the *genus* being always founded on the parts of the fructification, as being invariable; and the description of the *species* of each genus is from striking circumstances of the root, stem, leaves, buds, and mode of flowering, &c. all of which are often very different in different *species* of the same genus; but the flower or fructification being unchangeable, that, and none other, is to be employed in establishing the genus, and therefore the *characteristic* mark of each genus is to be fixed from the figure, situation, connection, number, and proportion of all the parts of the flower, as the *calyx*, *corolla*, *stamina*, *pistillum*, *pericarpium*, and the *femen*, or seed; which parts are defined to be the fructification of all vegetables, being a temporary but invariable part appropriated to generation, terminating the old vegetable, and furnishing seed to begin the new; and which *characteristic* marks being constant throughout the *species* of every respective genus, and every genus invariable in itself, the flower is now universally established as the only proper basis from which to draw the characters, to distinguish all the numerous genera of plants.

But before the invention of a regular systematic method, Characters were drawn from any, or all the parts of the plant indiscriminately, as the root, stem, leaves, buds, and general habit; a circumstance so variable and uncertain, as explains the great confusion that so long obtained in botany; such descriptions being only to distinguish the different *species* of a *genus*.

The Characters therefore of every genus are founded on the parts of the flower, which being destined for the reproduction of the plant and fruit, must necessarily be most constant; and all the *species* of every genus, however different in their external habit, which is often very considerable, yet they perfectly agree in their fructification: thus, for example, what apparent difference there is betwixt the cab-

bage, cauliflower, broccoli, and turnep! and yet all are *species* and varieties of the genus *Brassica*, perfectly agreeing in their general Characters. See **GENUS** and **SPECIES**.

CHEIRANTHUS, Wallflower, and Stock-Gilliflower.

The plants are of the flowery tribe, and consist chiefly of herbaceous, shrubby biennials, perennials, and annuals, of upright, branchy growth, from one foot to a yard high, adorned with longish, narrow leaves, and long, erect spikes of numerous, four-petalous, very ornamental flowers.

Class and order, *Tetradynamia Siliquosa*.

Characters.] **CALYX**, four spear-shaped, concave, erect, connivent, deciduous leaves. **COROLLA**, four roundish petals, placed in form of a cross. **STAMINA**, six parallel filaments, two rather shorter than the others, and erect, acute antheræ. **PISTILLUM**, a long, prismatic, tetragonous germen, the length of the stamina; exceeding short, compressed style; and thickish, divided, reflexed, permanent stigma. **PERICARPIUM**, a long compressed filiqua, or pod, containing many compressed seeds.

There are many *species*; but those of most merit are those celebrated beautiful plants, well known by the vague names of Wallflower and Stock-Gilliflower, so valuable as ornamental garden-plants, both for the elegance and delightful fragrance of their numerous flowers, and of which three principal distinct *species* are the most generally esteemed and cultivated, consisting of two biennial-perennials, and one annual, each of which comprise many fine varieties, all very ornamental-flowering plants, of moderately hardy growth, to cultivate in the open ground, for adorning the flower-borders, &c. and to plant in pots: and to which we shall add two other *species* of the Stock-kind, which also flower very ornamentally; one a small delicate-flowering annual, and the other a biennial-perennial of dwarfish growth: both of them very floriferous, and proper for the same purposes as the three former-mentioned.

The Wall-flowers are very distinguishable from the Stocks by their narrow, smooth, green leaves, those of the Stocks being broader, thicker, and mostly of a hoary-whitish hue.

The *species* of our gardens are,

1. **CHEIRANTHUS** *Cheiri*.

(*Cheiri*)--or *Common Wall-flower*.] Cheiranthus with ligneous, long, fibrous, tough roots; an upright, woody, abiding stalk, divided into many erect, angular branches, forming a bushy head from one to two or three feet high, closely garnished with narrow, spear-shaped, acute, smooth, green leaves, and all the branches terminating

terminating in long erect spikes of numerous flowers, which, in different varieties, are Yellow, Bloody, White, &c.

Varieties of this are,

Common Dwarf Yellow Wallflower—having a low bushy head ten or twelve inches high, and smallish yellow single and double flowers.

Large Yellow Wallflower—having a branchy stem forming a bushy head, eighteen inches or two feet high, and large yellow single and double flowers.

Large Yellow Bloody Wallflower—having a branchy head, from about fifteen inches to two feet high, and yellow blood-spotted single and double flowers.

Bloody Wallflower—having a branchy stem fifteen or eighteen inches to two feet high, and large blood-coloured single and double flowers.—This variety, in its true bloody state, is esteemed the most beautiful of all the Wallflower tribe, and its flowers are the largest.

White Wallflower—having a very branchy greenish stem, and bushy head about a foot high, narrow shining green leaves, and pure white single and double very fragrant flowers—with cream-coloured single and double flowers.

This sort being rather tender, should have a dry soil and warm situation, where it will often flower, both in the spring, and in autumn and winter.

Narrow-leaved Straw-coloured Wallflower—having a bushy stem and head a foot high, very narrow leaves, and long close spikes of straw-coloured single and double almost scentless flowers.

Variegated-leaved Yellow Wallflower—having a branchy stem twelve or eighteen inches high, garnished with gold-striped leaves, and yellow single and double flowers—silver-striped leaves, and yellow flowers.

Winter Wallflower—having a branchy stem and bushy head, a foot or fifteen inches high, and white or yellow single flowers, appearing the beginning of winter, often continuing, if mild weather, till spring, when they exhibit a general bloom as the other varieties.

All the above varieties of this species (Wallflower) are robust, bushy, evergreen, hardy biennials and perennials, very flowery plants, flowering principally in April, May, and June, often exhibiting their flowery spikes two or three feet high; the plants growing freely in any common soil and open exposure, are great ornaments to the compartments of the pleasure-ground. The Double are in most esteem, and more particularly the Double Bloody sort; but all the varieties effect a fine diversity, and the Singles of each sort afford plenty of seed

for propagation, and from which both single and double-flowered plants are produced; and all the sorts may also be increased by slips, cuttings and layers, in a shady border in May or June, which is the only method to continue the fine double kinds, or any other particular variety.

2. CHEIRANTHUS *incanus*.

Hoary Cheiranthus, or Stock-Gilliflower.] Cheiranthus with ligneous, long, naked, white roots; an upright, strong, woody, abiding stem, from one to three feet high, branchy at top, adorned with long, spear-shaped, obtuse, hoary leaves; and the top of the stalk, and all the branches, terminated by erect spikes of flowers, from one to two or three feet long, of different colours, in different varieties.

Varieties of this are—

Red, or Queen Stock-Gilliflower—having a robust stem a foot high, very branchy and bushy at top, every branch terminated by an erect close spike of pale-red single and double flowers—bright-red single and double flowers—variegated red and white single and double flowers.—This sort and varieties are remarkable for their prolification in many double-flowered plants, from seed, and that, if sown early in spring, it flowers a little the same year towards autumn, which is a peculiar merit in this sort, because the double flowers of the same year's seedlings discovering themselves at that time, we take them up with good balls to their roots, and pot them, to move to occasional shelter from frost, whereby they flower earlier, and much stronger in spring, than those that are fully exposed, especially in severe winters, when the Stocks in general are sometimes considerably cut.

Scarlet, or Brompton Stock-Gilliflower—having a strong, upright, single stem, from one to three feet high, sometimes branching upward, and crowned by a cluster of long, thick leaves; and from the centre an erect flower-stalk two or three feet long, issuing forth several side-branches, all of which, and the main stalk, forming beautiful erect spikes of large scarlet single and double flowers.

This in its double state makes a most superb appearance, and is the grandest of all the *Cheiranthus* kind, the flowers being often as large as small roses, numerous and closely placed, disclosing themselves in successive order upward, according as the spikes gradually advance in height, which, when at full length, frequently show the plant upward of four feet high, exhibiting a full bloom five or six weeks.

White Brompton Stock-Gilliflower.] Grows like the last mentioned; and produces long
K k erect

erect spikes of large elegant flowers, of a beautiful appearance, and particularly fine in the full doubles.

Purple, or Twickenham Stock-Gilliflower—having a thick stem a foot and half or two feet high, very branchy upward, and all the branches terminated by erect spikes of purple single and double flowers—purple blood-spotted single and double flowers—variegated purple and white flowers.

White, or Shrubby Stock-Gilliflower—having a shrubby firm stem, from a foot to a yard high, divided and subdivided into many short branches, forming a bushy shrub-like head, very shining green leaves, and all the branches terminated by erect spikes of pure white single and double flowers—whitish-flesh-coloured flowers—whitish-purple flowers—whitish-red spotted flowers.—This sort and varieties are remarkable for becoming shrubby, and of several years' duration in a dry soil, and for affording many double-flowered plants from seeds.

All the above varieties of this species (*Cheiranthus incanus*) are hardy, evergreen, very flowery, ornamental biennials and perennials, and grow freely in the open ground, and are great ornaments to the pleasure-ground in May, June, and July, exhibiting their bloom from two to four feet high: the double kinds are singularly beautiful; but all the sorts form a fine variety, and the singles produce plenty of seed in autumn, and from which both single and double-flowered plants are annually produced.

3. CHEIRANTHUS annuus.

Annual Stock-Gilliflower or Ten-Weeks' Stock.] *Cheiranthus* with an upright, woody, smooth stalk, divided into a branchy head, a foot or fifteen inches high, garnished with spear-shaped, blunt, a little indented, hoaryish leaves, and all the branches terminated by long erect spikes of numerous flowers, of different colours in different varieties.

Varieties of this are,

Common Hoary-leaved Ten-Weeks' Stock—having hoaryish leaves, and purple single and double flowers—red single and double flowers—white single and double flowers.—Scarlet-flowered—dwarf French, with single and double flowers, white, red, purple, &c. very floriferous.

Prussian Wallflower-leaved Ten-Weeks' Stock—having smooth, bright green leaves, and pure white single and double flowers—purple single and double flowers.

All these varieties prosper in the full ground, and flower beautifully from June or July till the end of autumn, and the singles afford abundance of seed, and from which both sin-

gle and double kinds are always produced; for, being annual, they can only be continued by seed sown annually in spring.

They are denominated Ten Weeks' Stock, from their flowering in about ten weeks from the time of their first growth.

4. CHEIRANTHUS maritimus.

Maritime Dwarf Annual Cheiranthus, or VIRGIN STOCK, erroneously called, *Virginia Stock-Gilliflower.*] *Cheiranthus* with slender, herbaceous, very branchy, diffuse stalks, six or eight inches high; small, spear-shaped, close-sitting leaves; and all the branches terminating in short, loose spikes of many small, purple, single flowers.

This species is very commonly called Virginia Stock, which is a wrong appellation, as the plant is not of that country, or any part of America, but originally of the Levant, inhabiting the sea-coast: the name, *Virgin Stock*, may be applicable from its small size, and delicate little flowers.

5. CHEIRANTHUS fenestralis.

(Window-flowering) — Dwarf Perennial Stock-Gilliflower.] *Cheiranthus* with a low, under-shrubby, hoary stem, a little branchy above, six or eight inches high; small, spear-shaped, obtuse, recurved, hoary leaves, crowded, and standing different ways; and the stem and branches terminated by erect, racemous spikes of purple flowers; the plant biennial-perennial; sometimes called Window-flowering, as being often planted in pots to place in a window, on account of its low, neat growth, ornamental, and sweet odorous flowers.

The flowers of the first three species, and numerous varieties, are produced in erect spikes, from half a foot to a yard long, each spike having many flowers, especially all those of the first three species; and those of the doubles are generally the most numerous, largest, more closely placed, and of longest duration. The single flowers are composed separately of four broad petals (see their *Characters*); but in the doubles, the petals are multiplied in many series to the very centre, to the total exclusion of the fructification, so consequently afford no seed; the singles however afford plenty, and from which, plants of both sorts are obtained. The double-flowered kinds are very distinguishable at the first appearance of the flower-bud, which is more robust, large, and swelling, than those of the singles.

The other two species, the (*Cheiranthus maritimus* and *fenestralis*) Virgin Stock, and the dwarf perennial Stock-gilliflower, are also very flowery little plants; and very proper to adorn the front of flower borders, &c. the former

former of which in its diffuse branchy growth produces numerous small delicate flowers, in succession, a month or six weeks; proper to sow in patches in the borders, or to form a summer edging, and for pots; the other sort also flowers very ornamentally in its low growth in May, June, and July, imparting an agreeable odour, proper both for borders, and to plant in pots, to adorn a room window, or where required.

The first and second species, *Wallflower*, and *Stock-Gilliflower*, and all their respective varieties, may be considered both as biennials and perennials, with abiding stalks, garnished with leaves the year round, and very profuse in most fragrant flowers. Considered as biennials, the plants being raised from seed in spring, attain nearly their full growth by autumn, stand the winter, and in spring following shoot up their flower-spikes, which gradually advance in height, and the flowers continue opening until June and July, and which are succeeded by ripe seed in July, August, and September; soon after which the plants frequently perish, especially when growing in rich moist ground; or, if they survive another year, they generally assume a dwindling growth, become straggling and irregular, and flower weak and inconsiderably. As to their perennial property, being raised as above, and planted in a dry, rubbishy, gravelly, or any poor lean soil, they generally effect a stunted growth, become shrubby and perennial, of several years' duration, and flower annually, as is evident by those which grow naturally out of the crevices of walls, ruins, and old buildings, in many parts of England, particularly the Wallflowers; hence they derived the name; though the Stocks will also grow in the same manner, with short, stunted, stocky stems; hence we suppose they obtained the appellation of stocked, or Stock-Gilliflower: however, when cultivated either in good or bad earth, and whether of two or more years' duration, most of the sorts, both Walls and Stocks, generally flower strongest, and in greatest beauty, the first year of flowering; therefore, to have a constant succession of plants to flower in perfection, a supply must be annually raised from seed in April or May for next year's bloom, though the Wallflowers may be increased and continued perennial, by planting slips of their young shoots in May, which is the only method to propagate the double kinds; for the Walls are not very prolific in doubles from seed; the stocks may also be continued by slips, but these never succeed near so well as the Walls; besides, the different varieties of Stocks are often very pro-

fuse in double-flowered seedlings, which renders the other practice unnecessary; and the Queen Stock, White Stock, and the Twickenham Purple, frequently have one third; or half their seedlings double; but the White Stock most of all.

All the varieties of the above two species prosper freely in the open border, in any common soil and open exposure, though, when growing in rich moist land, they, acquiring a luxuriance of growth, are more liable to injury from the power of severe frost, but more particularly the stocks; and in both species the double varieties are more liable to suffer than the single kinds, so that some of the finest doubles should always be potted, to move to occasional shelter of a deep frame, to be covered with glasses or mats, in time of severe weather in winter, but must be fully exposed in all mild weather.

The third species, *Ten-Weeks' Stock* and varieties, is but of one summer's duration, rising from seed in spring, and perishing at the first attack of hard frost in winter, unless they are sheltered in a frame or green-house, in which young plants may be continued all that season, to flower early in spring. All the varieties of this species are of moderately-hardy growth, and most beautiful annuals, very profuse in most elegant spikes of flowers great part of summer and autumn, and the plants prosper in the open borders, and make a fine appearance, particularly the double kinds; and all the varieties are easily raised from seed in the common ground in spring, or may be forwarded in a hot-bed: in either method, being planted out in the borders in May or June, they flower in July, and by two or three different sowings, at a month or six weeks' interval, from February or March, to May, a succession of full-blooming plants may be obtained from July until September, October, or November.

The fourth sort, *Cheiranthus maritimus*, is but of two or three months' duration; it however, considering its diminutive stature, is a very flowery plant, and proper to sow in patches, to adorn the fronts of borders, which, by a repetition of two or three sowings from February or March, to May, will afford a succession of bloom from June till October.

It is also sometimes sown to form a summer edging in small gardens, which, during its bloom, is very pretty; and is also proper to sow in pots, to place in a room window, or as required.

The fifth sort, *Dwarf Perennial Stock*, is sometimes of two, three, or several years' duration; flowers very ornamentally in June

and July; proper for the fronts of borders and to plant in pots.

Propagation of the first two Species.

The two first species, and all their respective varieties, are propagated plentifully from seed, in the common ground in spring, for transplantation; and from the seedlings both single and double-flowered plants are obtained; but the Stocks are considerably more prolific in doubles than the Walls: however, when fine doubles of these are obtained from seed, &c. they may be multiplied at pleasure by slips of their young side-shoots early in summer; for all the sorts of Wallflowers, both single and double, grow freely by slips: but as to Stocks, although they will also grow by slips, they do not make near such progress as the Walls, nor do they ever grow freely, nor make such thriving plants; but this is no great loss, since the seedlings seldom fail to afford great plenty of doubles.

First, of raising both species from seed, observing that the plants raised one year flower the next.

The seed of all the varieties may be had cheap enough of all the nurserymen; but the great article is to procure such as has been saved from the finest of each respective variety (see *Saving the Seed*). The time for sowing is as follows: the Wallflowers may be sown any time in April; though in very rich ground, from about the 20th of that month to the 15th of May is the most proper time to sow both sorts; for if sown sooner in a rich warm soil, the plants are apt to acquire a too great luxuriance of growth, and thereby subject to suffer by severe frost and excessive wet in winter. For the reception of the seed choose a spot of undunged light earth, in a quite open situation, and, as soon as dug, sow the seed on the surface, each sort separate, and rake it in light and evenly. The plants will rise in a fortnight, when, if dry weather prevails, give frequent waterings, and in July, or when they are about three inches high, a quantity of the stoutest should be thinned out in a moist time, and planted singly in different parts of all the borders, and the other compartments of the pleasure-ground, where it is designed they shall flower, which all the sorts will effect the following spring and summer. Or the Wallflowers may be pricked in nursery-beds nine inches distance till October, November, or the following spring, then finally transplanted with balls to their roots; though where there is room in the borders at the time above-mentioned, it is most advisable to plant out a great part of these plants at once while young, where they are to remain, because they do not

succeed so well by removals, especially the Stocks, as having long sticky roots, ill furnished with fibres; but the plants of both species, when removed large, unless with good balls, never take root so freely, nor establish themselves so firmly, nor are of so long duration, as when planted out finally at the period of growth first advised.

The Wallflowers however succeed much better by removals than the Stocks, their roots being more fibry, and upon particular occasions might even, when of pretty large growth, or when just ready to bloom, be removed where wanted with balls to their roots; but those of the Stocks being so scanty of small fibres, that the plants, when large, rarely rise with good balls, without the greatest care in digging wide and deeply round them.

Where the above two species are raised for sale, as is greatly practised by the market-gardeners in the vicinity of London, the plants from the seed-bed are pricked or planted out in nursery-beds, in rows nine inches or a foot distance, and the same distance in the lines; and if they here assume a luxuriance of growth, they sometimes transplant them again about the end of August into other beds, as above, especially the Wallflowers, to check their luxuriance, and promote their growing bushy, to render them more marketable; for vast quantities of these plants are brought to Covent-Garden, and the other gardeners' markets in London, in the spring of the year, for sale, just as they begin to show bloom, when the colours and properties of the flowers are discoverable, all brought with small balls of earth to their roots, for the purchasers will not buy them without balls; and are there sold, the single kinds for a shilling or eighteen-pence to two shillings per dozen, but the fine doubles are commonly brought in pots, and one plant of which often fetches as much, or more, than a dozen of the others.

If it is designed to cultivate any of these plants upon walls, ruins, or rock-work, for variety, it is most eligible to sow the seed where the plants are to remain, sowing it in the crevices in autumn or spring, covering it with any kind of dry earth a quarter or half an inch deep, and leave it to nature, where the plants will come up, flower, and scatter their seeds, and propagate themselves, and endure for years.

If seeds of any of the sorts are sown in any rubbishy or poor soil, and the plants thinned and permitted to remain unremoved, they are commonly of longer duration than those that are transplanted.

When intended to show a bloom of any of the double seedlings in pots, they may be potted with

with balls to their roots as soon as they show their double flower-buds; but as the Stocks have long naked roots, not very fibrous, they remove rather badly when large; and as they are considerably more prolific in doubles than the Walls, you may also, at the time of transplanting from the seed-bed, plant some in large pots, three or four in a pot; and it is probable one or more in each pot may prove doubles, particularly the Queen, Purple, and White Stock; so that as soon as the doubles are discoverable, cut the others off close to the bottom, not pull them out, which would loosen the roots of the remaining plants.

Propagation by Slips.

The propagation by slips or cuttings is practised principally for multiplying the fine double kinds, but chiefly for the Wallflowers, for the reasons already hinted: the time of year for this work is April, May, and June, though they generally afford the best slips in May; these are the young side-shoots without flowers, three, four, or five inches long, which slip or cut off close to the branches, divest them of the lower leaves, and plant them in a shady border six inches distance, and two, three, or four inches deep, according to their length, giving occasional waterings in dry weather, where they will readily form roots, shoot at top, and make good plants by October, when the fine sorts should be each planted separately in pots, to move to occasional shelter of a frame during winter, covering them only in time of hard frost, and they will all flower the spring following.

All the varieties may also be propagated by layers of their young pliable branches in May and June, as practised for carnations; but the raising them from slips is the more ready and expeditious method, and generally productive of the best plants.

To continue a stock of handsome strong flowering plants of all these sorts, both of the Walls and Stock-Gilliflowers, and of the double Wallflowers particularly, should also raise a proper supply, annually, by slips or cuttings, &c. for, although the plants sometimes live two, three, or more years, they always exhibit the finest bloom the first season of full flowering, both in the seedling plants and those raised from slips.

All the double plants that are retained in pots should be moved to a place of occasional shelter in winter, either in a deep frame, or plunge them in a warm border, and arch them over with hoops; and in frosty weather, if in a frame, cover them with glasses, or, if under arches, with mats, and with long litter over either of these, when the frost is very severe.

Propagation of the third and fourth Species.

The third species, *Ten Weeks' Stock*, is propagated by seed for transplantation, any time from the middle of February to the middle or end of May; and by three different sowings in that period of time, you will obtain plants, exhibiting a constant bloom from July till almost Christmas.

The seed will grow freely on a warm border, especially those sown after the middle or latter end of March; but to have the plants as forward as possible, I should advise the first sowing to be in a moderate hot-bed, or, in default thereof, in a frame, or under a hand-glass, for shelter on nights during the cold weather, both before and after the plants come up; or may be sown in pots to move under some place of protection occasionally; or covered with hand-glasses; sowing the seed on the surface, and either rake it in lightly, or cover it with fine earth a quarter of an inch deep; or may be sown thinly in shallow drills: and when the plants have several leaves, about two or three inches high, take the opportunity of moist weather in May, to plant some out at once into the borders or places where you design they shall flower, generally disposing them toward the front part and middle, in a varied order, planting three plants together, two or three inches apart in patches; and they will thus display their flowers more conspicuously and ornamental than if singly, and will have a better chance of obtaining some in each patch with double flowers, which is always desirable; and some should also be planted in pots in the same order, giving a little water as soon as planted, and, if dry weather, repeat the waterings occasionally; and they will soon take root, and grow freely without farther trouble.

If you design to exhibit a blow of these plants by themselves, plant them in four feet wide beds, in rows a foot asunder, allowing the same distance in the rows.

When it is intended to have a show of double kinds in pots, then either at the time of planting out, set three plants in each pot, and as soon as they show bloom, it is probable one or more of the three will be double, when the others may either be retained, or some, or all be cut away, not pulled up, because of disturbing the roots of the remaining ones, or, if the plants are in beds, some of the doubles, as soon as discoverable, may be taken up with good balls, and plant one in each pot, give water, and place them in the shade a week or two.

Or some of any of the sorts of *Ten-weeks'* may be sown in patches in the borders, or pots, &c. to remain where sown, which may be performed

performed the middle or latter end of March, or any time in April, not generally sooner in the open ground; sowing several seeds in each patch, and when the plants are advanced a little in growth, thin them where too thick, leaving about three of the strongest in each patch; and they will then grow freely, and flower in proper season, June or July till September, &c.

But to continue a succession in full flowering till the end of autumn, October, or November, in mild weather, should perform two or three different sowings at about a month's interval; an early sowing in February or March, either in a hot-bed or under glasses, &c. a principal sowing in April in the full ground, in a bed or border, or pots, &c. and a late sowing in May; all as above advised, and managed in the same manner, and they will continue a succession in constant flowering from June till October.

To have 'Ten-weeks' flower as early as June, may be sown in pots in a hot-house, in January or February, and the plants pricked into other pots, three or four in each, to remain; or sown in February, or early in March, in any common hot-bed under glasses, and when the young plants are one or two inches in growth, prick them into other pots as above, placing them also in a hot-house, or under protection of glasses, and they will thus flower early in summer: or, some might be sown in autumn, about August or beginning of September, and the plants pricked three or four together in small pots, and in October or November, plunged in a glass case, or under a frame and glasses, plunging the pots in a bed of old tan, or a raised bed of dry light earth; and thus to preserve them all winter, giving air in mild weather; they will flower early in the ensuing year, in April and May; or if some are plunged in a bark-bed of moderate heat, towards Christmas or in January, &c. they might be forwarded to earlier flowering.

Or to continue some flowering in winter, if some late-sown young plants are planted in pots in June, July, or beginning of August, placed in a shady situation properly watered, they will flower in autumn, and in October be removed into a green-house, or garden-frame under glasses, they will continue flowering great part of the winter.

The fourth sort, *Dwarf Virgin Stock*, is raised from seed, sown a quarter of an inch deep in the places where the plants are to remain, either in patches in the fronts of borders, or as an edging, as already observed, or some sown also in pots; in all of which, the plants, in their diminutive nature, will flower

very agreeably in numerous small flowers; but as they are but of a few weeks' duration, should make two or three different sowings at a month's interval, from March till May or June, whereby to continue a succession of flowers all summer.

The fifth sort, *Dwarf Shrubby Stock*, is propagated by seed, the same as directed for the Walls and Common Stock Gilliflower; and the plants treated in the same manner; planting some towards the front of flower-borders, &c. and some in pots; they will flower in the same order of time as the abovementioned, generally, great part of summer and autumn; and the same plants sometimes continue three or four years, increase in branches above, and flower more abundantly in proportion.

Saving Seed of all the Sorts.

All the sorts afford seed plentifully in their single state; the doubles none at all; and it ripens abundantly in June, July and August.

In order to continue a succession of the finest sorts of the three first species and varieties, you ought to be choice in the plants from which to save seed: the largest plants therefore of each respective variety of singles, and with the largest flowers of the deepest or brightest colours, are to be marked; and where you discover any with flowers that exhibit a tendency towards a semi-double state, these are also particularly to be chosen; that is to say, the singles having naturally but four petals, but sometimes here and there one will sport, and have five, six or more, approaching to half doubles; and seeds saved from such kinds are always more prolific in double-flowered plants than that of the entire single flowers: likewise it has been recommended by some florists that good single plants, growing close to, or very near doubles of the same kind, are also proper to mark for seed; though as the full doubles are generally destitute of the parts of fructification, I cannot consider their presence, in this case, has any particular effect; the experiment however may be admitted, and all bad kinds, particularly singles, growing near the chosen seed-plants, should be cleared away. By observing the above hints, you cannot fail of continuing an annual show of these flowers in their greatest perfection.

According as the seeds ripen, cut off the branches in dry weather; tie them by the ends in small bunches, and hang them up in a dry but airy place, and when the seed-pods are properly dried, beat or rub out the seed, and put it up in paper bags till spring.

As to the Virgin Stock, this having no varieties in double flowers, it produces plenty of

of seed in summer and autumn, which should be gathered accordingly; pulling up or cutting off the stalks of the plants, spread them, to dry the seed-pods, a few days, then rub out the seed, clear it from the husks, &c. and bag it up for next year's sowing.

The Dwarf Shrubby Stock producing seed similarly as the Wall and common Stock Gilliflowers, it may be saved in the same manner as intimated for those two species.

CHELIDONIUM, Celandine, and *Glaucium*, or Horned-Poppy.

This genus furnishes hardy herbaceous perennials, biennials, and annuals, of the flowery tribe, obtaining from about eighteen inches to a yard in stature, ornamented with large, divided leaves, and large, four-petalous, yellow and scarlet flowers.

Class and order, *Polyandria Monogynia*.

Characters.] CALYX, two oval, concave, caducous leaves. COROLLA, four large, roundish, plane, spreading petals. STAMINA, numerous filaments, and oblong, compressed, twin antheræ. PISTILLUM, a cylindrical germen, no style, but a headed bifid stigma. PERICARPIUM, a cylindrical bivalvular pod, having many seeds.

The species of note are,

1. **CHELIDONIUM majus**.

Greater Common Perennial Celandine.] Chelidonium with a thick knobby root; upright, round, branching, hairy stalks, two or three feet high; large, many-lobed leaves; and at top of the stems and branches umbellated foot-stalks, supporting large yellow flowers.

Varieties.] Greater Celandine with jagged leaves, and double yellow flowers—with striped jagged leaves.

2. **CHELIDONIUM Glaucium**.

(Glaucium)—or Biennial Chelidonium, called Horned-Poppy.] Chelidonium with upright, robust, round, smooth stalks, divided into many branches two feet high; pinnatifid lower leaves, those above lobated, and their base embraces the stalk; all the leaves and stalks glaucous; and from the axillas of the leaves, single foot-stalks, supporting each one large yellow flower, succeeded by long horn-shaped pods nine or ten inches in length.—Hence the appellation, Horned-Poppy.

It flowers in June and July, and ripens abundance of seeds, and being a biennial, dies soon after.

3. **CHELIDONIUM corniculatum**.

Corniculated Annual Chelidonium, or Scarlet Horned-Poppy.] Chelidonium with upright rough stalks half a yard high; large, pinna-

tifid, finely-jagged, many-pointed, hairy, close-fitting leaves, of a glaucous colour; and scarlet flowers of short duration, succeeded by long, corniculated, or horn-shaped, pods.

The flowers of all these species in their natural state are composed of four large, roundish, spreading petals; but in the double kind the petals are numerous.

They are all very hardy plants, and prosper in any common soil.

The first species grows wild in shady lanes, sides of banks, and such-like uncultivated places; is valuable in medicine, but in its common state is rarely admitted into gardens. The double-flowered variety, however, merits culture as a flowery perennial for large borders, and may be multiplied abundantly by dividing the roots in autumn or spring.

The second sort, *Chelidonium Glaucium*, merits notice both as a flowery biennial, and for the singularity of its long horned pods; it inhabits the sea coasts, but has been long admitted in gardens, and grows freely in the borders, or in rock-work, &c. It is propagated plentifully by seed in autumn or spring, sown either where the plants are to remain, or for transplantation; they come up one year, flower the next, and soon after perish; so must be raised annually from seed.

The third sort will form a variety in the borders among other hardy annuals, and should be sown in February or March a quarter of an inch deep, in patches where they are to remain.

CHELONE, *Chelone*.

It consists of four herbaceous, flowery perennials, with upright stalks two feet high, decorated with spear-shaped leaves, and beautiful spikes of monopetalous, ringent, different-coloured flowers, in autumn.

Class and order, *Didynamia Angiospermia*.

Characters.] CALYX, a monophyllous, quinquepartite, permanent cup. COROLLA is monopetalous and ringent, with a short tube, swelling at the mouth, the upper lip obtuse and indented, the under one slightly trifid. STAMINA, two long and two short filaments, inclosed in the back of the corolla, and incumbent antheræ. PISTILLUM, an oval germen, slender style, and blunt stigma. PERICARPIUM, an oval, bilocular capsule, and numerous, roundish, bordered seeds.

The species are,

1. **CHELONE glabra**.

Smooth Virginian Chelone.] Chelone with thick very creeping roots; many upright, smooth, channelled stalks, two feet high, garnished with spear-shaped, pointed, serrated, close-

close-sitting leaves, in pairs opposite; and all the stalks terminated by close spikes of flowers, of different colours in different varieties. ♣

Varieties.] Smooth Chelone with white flowers—with rose-coloured flowers—with red flowers—with purple flowers.

2. CHELONE *hirsuta*.

Hairy Virginian Chelone.] Chelone with spreading roots; upright very hairy stalks two feet high, garnished with spear-shaped, hairy, opposite leaves; and all the stalks terminated by spikes of flowers, of different colours in different varieties.

Varieties.] Hairy Chelone with white flowers—with blue flowers—with red flowers—with purple flowers.

3. CHELONE *obliqua*.

Oblique-leaved Virginian Chelone.] Chelone with creeping roots, many upright stalks two feet high, garnished with oblique, lanceolate, serrated leaves on short petioles, and the stalks terminated by spikes of bright purple flowers.

4. CHELONE *Penstemon*.

(Penstemon)—or Forking paniced American Chelone.] Chelone with upright branchy stalks a foot and a half high, adorned with spear-shaped, pointed, opposite leaves, their base embracing the stalk, and short, loose spikes of purple flowers from the forks of the branches.

The flowers of these species and varieties are of the ringent or gaping kind, many upon each spike, which in all the varieties appear from September till November, and are sometimes succeeded by ripe seeds in England.

They are all very hardy, and grow freely in the open ground, in any soil and exposure.

They are choice furniture for the pleasure-ground, particularly the three first sorts and varieties, their flowers exhibiting a very ornamental appearance for two months in autumn, after the principal bloom of most other flowers is past; and being of different colours, they form a fine variety with each other; and the plants may be readily increased at pleasure, to furnish all the different compartments abundantly.

The propagation of all these species and varieties is by roots, which multiply exceedingly, and may be parted in autumn, or early in spring.

The fourth sort being rather biennial, must be raised annually from seed, which if sown in autumn as soon as ripe, the plants will readily rise the following spring, and in June or July may be planted out in the border.

CHENOPODIUM, Goose foot, Wild Orach, or Wild Spinach, &c.

This genus retains hardy herbaceous plants for culinary and ornamental uses, and shrubby evergreens for the green-house.

Class and order, *Pentandria Digynia*.

Characters.] CALYX, five oval, concave, permanent leaves. COROLLA, no petals. STAMINA, five filaments, and roundish didymous antheræ. PISTILLUM, an orbiculate germen, short, two-parted style, and blunt stigmas. PERICARPIUM, none; a single seed lodged in the calyx.

The species are,

1. CHENOPODIUM *Bonus-Henricus*.

Good-Henry, All-Good, English Mercury, or Wild Spinach.] Chenopodium with large, triangular, arrow-pointed, entire leaves from the root; upright, thick, striated stalks, garnished with triangular leaves, and terminated by close spikes of apetalous yellowish-green flowers in June and July, succeeded by ripe seeds in August.

It is perennial in root, the stalks annual; grows wild by way sides and in bye-lanes, but is sometimes cultivated in gardens as an esculent herb, to use for culinary purposes like spinach, and the young tender shoots, to boil and eat as asparagus.

The three following are hardy ornamental annuals.

2. CHENOPODIUM *Scoparia (Scoparia)*.

Belvedere, or Annual Mock Cypress.] Chenopodium with upright stalks, closely branching pyramidally from the bottom upward, forming a regular pyramid two or three feet high, fully garnished with very narrow, linear, spear-shaped, plane, entire leaves, and spikes of small greenish flowers.

The merit of this annual is in its beautiful pyramidal growth, resembling a young cypress tree, and is very ornamental; flowers in July, and ripens abundance of seed in autumn.

3. CHENOPODIUM *Botrys*.

Multifid-spiked Annual Chenopodium, called Oak of Jerusalem.] Chenopodium with upright branchy stalks near a foot high, garnished with oblong, sinuated, oak-shaped, fragrant leaves, and multifid naked spikes.

4. CHENOPODIUM *ambrosioides*.

Ambrosia-scented Annual Chenopodium, called Oak of Cappadocia.] Chenopodium with upright stalks two feet high; spear-shaped, indented, odoriferous leaves; and single leafy spikes.

These last two annuals are esteemed principally for the fragrance of their leaves; are both exotics, the *Botrys*, from the southern parts of Europe, the other from South America,

rica; but both hardy enough to grow here in the open air in summer, requiring shelter in winter; for, considered as annuals, if not protected in that season, they generally perish; but some being potted, moved under shelter of garden-frame, or green-house in winter, they will continue biennial or perennial; they flower in July and August, succeeded by ripe seeds in September.

The two following are shrubby perennials of the green-house.

5. *CHENOPODIUM fruticosum.*

Shrubby Mexican Chenopodium.] *Chenopodium* with shrubby, durable, branchy stalks, four or five feet high; spear-shaped, indented, fragrant leaves.

6. *CHENOPODIUM multifidum.*

Shrubby Multifid-leaved Chenopodium of Bonaria.] *Chenopodium* with shrubby durable stalks three or four feet high; multifid, or divided leaves, of many narrow segments.

The flowers of all these species are apetalous, i. e. not adorned with petals, so make no ornamental appearance.

The first species, *Good-Henry*, when intended to cultivate it as an esculent, it producing abundant seed, may be raised plentifully by sowing some in any open compartment of good ground either every year, or once in two, three or several years; as the roots being perennial, they continue producing leaves, &c. several years, but when the production appears weakly, should raise a fresh supply of young plants accordingly.

Generally sow the seed early in the spring, February, March, or beginning of April; or occasionally in autumn, beginning of August, and may be sown either broad-cast and raked in, or in drills; and, in either method, the plants, when grown a little, should be thinned ten or twelve inches apart, or rather, when of some advanced growth, transplanted at that distance in autumn or next spring, and they will grow stronger; the leaves may be cut for use the first year, especially of the spring-raised plants; and in the second season, in spring and summer, they will run up in strong growth; when the young leaves and tender tops may be cut to boil as spinach, as before intimated; and the young shoots to dress as asparagus, being scraped, boiled, and served up with butter; observing generally, to cut down the advancing oldest stalks occasionally in summer, and a constant supply of young leaves and shoots, will rise in plentiful succession from the roots, which being perennial, of many years' duration, will furnish a plentiful production every spring and sum-

mer; or may raise a supply of young plants every year or two as above.

As to culture, keep the plants clear from weeds all summer; and in spring loosen the surface of the earth about the roots; and sometimes in autumn, spread some dung on the surface, to invigorate the roots; and the gross part thereof raked off in the spring.

The *Belvedere*, and the other two annual species, are raised from seed in the full ground in March, sowing it on a bed of rich light earth, and rake it in lightly; and when the plants are two or three inches high, plant them out singly in different parts of the borders; or the seed may be sown half an inch deep, in patches where the plants are to flower, thinning them to a single plant in each place. Some of the *Belvedere* plants may also be potted, in which they have a fine effect, in assemblage with other potted annuals, in adorning any particular compartment. And it is likewise proper to pot some plants of the other two sorts for the same occasion; as also for moving them to shelter of a green-house, or garden-frame, to preserve them in winter in a biennial or perennial state.

The scattered or self-sown seeds of the *Belvedere*, in autumn, frequently grow, and the plants rise strong in the spring.

The two shrubby green-house species are easily propagated by slips or cuttings of their branches, planted in pots of light mould any time from March till June, which if plunged in a moderate heat, it will greatly forward them.

CHIOCOCCA, Snowberry-Tree.

This genus retains two West-India ornamental flowering shrubs for the stove, adorned with oval, pointed leaves and monopetalous flowers.

Class and order, *Pentandria Monogynia*.

Characters.] *CALYX*, five-parted, persistent cup, placed on the germen. *COROLLA*, monopetalous, and funnel-shaped, with the border divided into five acute reflexed parts. *STAMINA*, five slender filaments, topped with oblong, erect antheræ. *PISTILLUM*, a roundish compressed germen, placed below the flower, the style slender, and a single stigma. *PERICARPIUM*, a roundish compressed berry, crowned by the cup, having one cell containing two seeds.

The species are,

1. *CHIOCOCCA racemosa.*

Racemed Snowberry-Tree.] Rises with a climbing, branchy stem, several feet high, garnished with broad spear-shaped leaves, and flowers in a racemus, succeeded by white berries.

Varieties.] *Chiococca* with yellow flowers — with white flowers.

L. 1

2. *CHIOCOCCA*

2. *CHIOCOCCA paniculata*.

Panicled Snowberry-Tree.] Rises with an erect, branching stem, five or six feet high; garnished with small, oval, pointed leaves placed opposite, and flowers terminating the branches in panicles, succeeded by whitish berries.

These species add to the stove collection.

They are propagated by cuttings or layers in the summer, and when sufficiently rooted, must be planted in single pots, and treated as other stove plants of the like nature.

CHIONANTHUS, Snow-Drop-tree, or Fringe-tree.

This genus affords for our collection only one species, a fine, deciduous, flowering shrub, adorned with large simple leaves, and clusters of snow-white, fringed flowers.

Class and order, *Diandria Monogynia*.

Characters.] *CALYX*, monophyllous, erect, four-parted, and permanent. *COROLLA*, a funnel-shaped petal, divided at top into four long, narrow, erect segments. *STAMINA*, two short filaments inserted in the tube of the corolla, and heart-shaped antheræ. *PISTILLUM*, an oval germen, one style, and blunt trifid stigma. *PERICARPIUM*, an unilocular berry, including one hard seed.

The species is,

CHIONANTHUS Virginicus.

Virginia Snow-Drop-tree.] *Chionanthus* with an upright rough stem, dividing into a moderately branchy head eight or ten feet high, garnished with large, laurel-shaped leaves, and from every part of the branches long bunches of very white flowers on trifid foot-stalks.

This is a most beautiful shrub for the ornamental plantations of the pleasure-ground, and will prosper in any common soil, though it delights most in that of a somewhat moist loamy nature. Let it however be placed conspicuously, and if so as to have the shelter of other shrubs, there will be the greater chance of its exhibiting a more plentiful bloom.

The propagation of this shrub is by seed, and layers of its young branches; though by this method they emit roots very sparingly, and rarely in less than two years.

The seed is procured from America by the seedsmen, which rarely grows the first year. Let it however, as soon as it arrives, be sown in large pots of fresh loamy earth half an inch deep, and plunge them in a shady border, giving occasional weeding and watering till October; then move them to a frame, or where they can be occasionally sheltered during hard frost in winter; and if in March you plunge them in a hot-bed, it will bring them up freely; which harden gradually to

the full air, and give occasional shade from the mid-day sun at their first appearance, and water during summer, and shelter of a frame again from October to April, when the seedlings may be pricked separately in small pots, observing the above care for another year or two, then may transplant them into the full ground.

By layers:—chuse the young twigs of last summer; and, as they emit roots reluctantly, it is eligible to give some a slit, others a twist, at the part to be laid in the earth; give plenty of water during summer, and in two years it is probable some will be rooted.

CHIRONIA, Shrubby African Centaury.

This genus comprises eight or ten species, of which two only are for our purpose, low or moderate-growing, shrubby, green-house plants from Africa, garnished with oblong and spear-shaped leaves; and the branches terminated by monopetalous, tubular flowers, red, and purple, very ornamental all summer and autumn.

Class and order, *Pentandria Monogynia*.

Characters.] *CALYX*, one-leaved, five-parted, erect, permanent. *COROLLA*, monopetalous, tubular, the border five-parted, spreading. *STAMINA*, five broad, short filaments growing from the tip of the tube, and oblong, erect, large converging antheræ. *PISTILLUM*, an ovate germen, filiform style, and capitated stigma. *PERICARPIUM*, an ovate, bilocular berry, and in some a capsule, containing numerous small seeds.

The species are,

1. *CHIRONIA baccifera*.

Berry-bearing African Centaury.] *Chironia* with round, jointed, under-shrubby stems, very branchy and bushy above, growing two feet high, garnished with narrow, fleshy leaves; and at the ends of the branches beautiful red flowers, continuing in succession all summer and autumn; sometimes succeeded by ripe seed.

2. *CHIRONIA frutescens*.

Shrubby African Centaury.] *Chironia* with a round, shrubby stem, dividing above into several branches, growing three feet high: spear-shaped, fleshy, somewhat downy leaves; and at the ends of the branches and shoots, bright purple flowers, tubulous and spreading, of a very ornamental appearance continuing in succession all the summer; and the seeds ripen in autumn.

Both these species flowering very ornamentally all summer, have particular claim to our attention, and merit a place in every curious collection of exotics.

They, being tender, require the protection of a green-house or airy glass-case in winter; but

but will succeed in the open air in summer; keep them in pots of light sandy earth, and must have but very little water in winter.

Both the species are propagated by seeds sown in pots of light earth in the spring; and when the plants are come up, give them the benefit of fresh air admitted every day; and when arrived at some tolerable size, inure them by degrees to the full air in summer.

They may also be propagated by cuttings, assisted by a hot-bed.

CHRYSANTHEMUM, Corn-Marigold, (*Chrysanthemum*).

The plants are mostly herbaceous, and furnish some beautiful flowery annuals and perennials for the pleasure-ground, and some of shrubby growth for the green-house; all of which are upright, very branchy, and from two to four feet high, adorned mostly with finely divided leaves, and compound, radiated, white and yellow flowers.

Class and order, *Syngenesia Polygamia Superflua*.

Characters.] **CALYX**, a compound, radiated flower, having a hemispherical, imbricated cup. **COROLLA**, many hermaphrodite and female florets; the former are small, funnel-shaped, five-parted at top, and form the disk; and the females are oblong, ligulated, three-parted at the end, and compose the circumference or ray. **STAMINA**, five short filaments, and tubular antheræ. **PISTILLUM**, an oval germen, simple style, and two obtuse stigmas. **PERICARPIUM**, none. **SEMINA**, a naked single seed to each floret.

There are near thirty species; but as the greater part are of no merit in gardening, and some are common weeds of our fields, such as the Common Corn Marigold, and greater Wild Daisy, &c. we shall omit them here, and only introduce those that have merit as garden plants.

The first following is that elegant hardy annual, distinctively called *Chrysanthemum*.

1. **CHRYSANTHEMUM coronarium**.

Coronated Annual Garden Chrysanthemum.] *Chrysanthemum* with a single upright stalk from the root, divided into numerous erect branches a yard or more high, garnished with pinnatifid, deeply-cut leaves, having the exterior segments broadest, and all the branches and side-shoots crowned by elegant compound flowers, of different colours and properties, in different varieties.

Varieties of this are,] Coronated *Chrysanthemum* with white single and double flowers—cream-coloured single and double flowers—yellow single and double flowers—yellow and white single and double flowers—brimstone-

coloured single and double flowers—fistular, or quilled flowers, having all the florets hollow like a quill or pipe—with finely jagged leaves, and flowers of all the above colours and properties.

The flowers of all these varieties, in their natural single state, exhibit a round, open disk or middle, composed of numerous, small, tubular florets, and one or two series of long flat florets form the circumference or radius; but in the double flowers, the middle or disk is generally filled with the radius, and some are rendered as completely double as the finest ranunculus, and the impletion is remarkably regular and beautiful; but it is observable, that the first flowers are never so full and double as those which succeed them on the same plant.

All the varieties begin flowering in July; the flowers are exceeding numerous, and exhibit a constant succession of full-bloom till November; and both single and double are succeeded by abundance of seed.

The three next following are hardy perennials.

2. **CHRYSANTHEMUM serotinum**.

Late-flowering American Ox-eye Chrysanthemum.] *Chrysanthemum* with a very creeping root; upright strong stalks a yard high, divided upwards into branches; broad lower leaves sawed on the edges, those above spear-shaped, serrated, and pointed; and each branch crowned by a large white flower.

Varieties.] With double flowers—with deeply jagged leaves.

3. **CHRYSANTHEMUM monspeliense**.

Montpelier Ox-eye Chrysanthemum.] *Chrysanthemum* with upright branchy stalks three or four feet high; palmated lower leaves of many bipinnatifid lobes, those above finely pinnatifid, and all the branches terminated by large, white, radiated flowers, on long foot-stalks.

4. **CHRYSANTHEMUM corymbosum**.

Corymbous-flowering Chrysanthemum.] *Chrysanthemum* with upright stalks half a yard high; winged leaves, the lobes cut and serrated; and the stalks terminated by large white flowers in a sort of corymbus.

The flowers of the last three species are shaped like the wild white ox-eye daisy, but much larger, having large yellow disks, and white radii or rays, appearing in succession from July till September.

The two following are shrubby green house plants.

5. **CHRYSANTHEMUM frutescens**.

Shrubby Canary Chrysanthemum.] *Chrysanthemum* with a shrubby stalk, divided into a

branchy head, two feet high, adorned with narrow, thick, succulent, indented leaves, three-parted at the ends; and small white flowers, growing singly on naked foot-stalks from the axillæ of the leaves, appearing at most times of the year.

6. *CHRYSANTHEMUM flosculosum.*

Floscular Shrubby Chrysanthemum.] Chrysanthemum with a shrubby stalk, divided upward into a branchy head two feet high; oblong, indented, close-fitting leaves; and from the axillæ of the leaves, globular, deep-yellow flowers, having no rays, but composed wholly of floscular or hollow hermaphrodite florets, appearing from June till November.

The first species, *Chrysanthemum coronarium*, is a valuable annual for the common borders, and other quarters of the pleasure-ground, being grandly ornamental in a great profusion of flowers from July till the approach of winter; and each variety is remarkably prolific in doubles, with this peculiar property, that, although the flowers at their first appearance often exhibit themselves scarcely semi-double, the succeeding ones on the same plants improve more and more double to the very last. This sort is commonly deemed an annual, as, rising from seed in spring, producing flowers and seed the same year, and perishing at the first attack of frost; yet cuttings of its branches potted in autumn, to move to shelter in winter, take root, and continue till next year, and flower earlier by a month than the seedlings. See their *Propagation*.

The second, third, and fourth sorts, are hardy, herbaceous, flowery perennials, proper for the compartments of large pleasure-grounds; they will increase the variety by an autumnal bloom of two or three months' duration, and will grow any where.

The two shrubby sorts require shelter in winter, and, being ornamental, are proper for the green-house collection, so must be always retained in pots of good earth, and managed as other shrubby exotics of the green-house.

Propagation of all the Sorts.

First, of the annual sort, *Chrysanthemum coronarium*.

This annual and varieties are raised abundantly from seed, either in a hot-bed or warm border, in the spring, for transplanting; also by cuttings and slips of their branches in autumn.

By seed:--it may be sown in March or April; and to bring the plants as forward into flower as possible, it should be sown in a moderate hot-bed with other annuals of similar quality, such as the African Marigold, &c. (See

ANNUAL PLANTS). Or, in default of that convenience, sow it in a warm border under a hand-glass; though, if sown in a warm sunny situation in the middle of April, the plants will rise without any covering, but they will be later in flowering than those forwarded as above. In either method sow the seed moderately thin, either in small drills three inches asunder, covering it about half an inch deep, or scatter it on the surface, and cover it that depth with fine earth; or sown in a bed or border evenly on the surface, and raked in regularly, the plants will rise in a fortnight or less, especially if in a hot-bed; giving occasional waterings, and about the middle or end of May, or when the plants are about three or four to five or six inches high, take advantage of showery weather, and plant them out singly in the different parts of the borders or fronts of shrubberies, in the places where they are to flower, at six, eight, or ten feet distance, and, if dry weather succeed, give a few waterings the first week or fortnight.

If you are curious to cultivate only the fine doubles, you may, at the time of planting out, set two or three plants together, in patches the above distance; and when they show flower, to determine the sorts, may clear away the worst, leaving only one of the best doubles in each patch.

When designed to have a show of the finest doubles in pots, they may be transplanted therein as soon as they are discoverable by their bloom, for they will readily transplant with balls.

By cuttings or slips:--this is practised only for the propagation of the fine doubles for an early bloom the following summer, and the best time to perform it is September, or early in October. Cut or slip off a quantity of the robust side-shoots, from three to six inches long, without flowers; divest them of the lower leaves, and plant many of them together in large pots within an inch or two of their tops, and two or three inches apart; give some water, and place them in the shade during the hot weather, and by the end of October they will be rooted, when remove the pots either into a green-house or garden-frame for the winter, but the latter is the most eligible, where they may enjoy the full air in mild weather, and have occasional shelter from frost; and in April or beginning of May, transplant them singly into the borders, and some in pots, to move occasionally to ornament any particular compartment.

The plants thus raised will flower a month or six weeks sooner the succeeding summer, than those raised in the spring from seed.

It

It is however proper always to raise a quantity of seedlings annually, as before directed, so propagating by cuttings from the best doubles of these every autumn, for an early bloom the following summer, because, by continuing to propagate by cuttings always from the same plants, the flowers would degenerate small, less double, and at last become very inconsiderable and thinly produced.

To save seed from these varieties, let it always be from the fullest doubles, which, as well as the singles, ripen it abundantly in September.

Propagation of the Perennials.

The three hardy perennial species, which are the second, third, and fourth sorts, may be propagated plentifully, by dividing their roots any time in open weather from October to March. They may likewise be raised by seed sown in a bed of common earth in March, and raked in lightly; the plants will come up in April or May, and in June or July prick them a foot distance in a nursery-bed to remain till October, then transplant them into the borders.

Propagation of the Shrubby Sorts.

The two shrubby sorts are easily propagated by cuttings planted in pots of rich earth any time from April till July, giving occasional shade and water, and by September will be rooted and fit to transplant in separate pots, and in October removed to a frame or green-house for the winter.

CHRYSOBALANUS, Cocoa Plum.

This genus comprehends, for the stove, tender exotic trees from the West-Indies, of moderate growth, adorned with simple, roundish, and compound winged leaves; and pentapetalous, spreading, white and purple flowers, succeeded by ovate, plum-like, eatable fruit, in the places of their native growth.

Class and order, *Icosandria Monogynia*.

Characters.] CALYX, monophyllous, bell-shaped, five-cleft. COROLLA, five oblong, flat, spreading petals, inserted into the calyx. STAMINA, twenty or more filaments inserted into the calyx in a circle, and small twin antheræ. PISTILLUM, an ovate germen, the length of the stamina, and obtuse stigma. PERICARPIUM, a large, ovate, drupaceous fruit the size of a middling plum, containing an oval, five-furrowed, quinquevalvular nut.

The species is,

CHRYSOBALANUS Icaco.

(*Icaco*) — or *Cocoa Plum*.] Chrysobalanus with thrubby stems branching six or eight to ten feet high: garnished with ovate-roundish, stiff, coriaceous, entire leaves, placed alternate

on short petioles; and at the axillas and ends of the branches, loose corymbose bunches of small white flowers, succeeded by ovate-roundish fruit, red, purple, yellow, &c. but not produced in this country.

Variety,—*Compound-leaved Cocoa Plum*.] The leaves compound, formed of several winged folioles, each branched into six or seven pair of oval, entire lobes.

These trees are cultivated in this country in curious collections of hot house plants; for, being natives of the West-Indies and other hot parts of America, they require to have the constant protection and heat of our garden stoves or hot-houses.

They are propagated by seeds, that is, the stones or nuts of the fruit obtained from the West-Indies, sown in the spring, or as soon as procured, in pots of light earth, and plunged in a hot-bed or bark-bed, giving occasional waterings; and when the plants are come up two or three inches high, transplant them singly into middling small pots, and plunged in the hot-house bark-bed, or any other under glasses, &c. water and shade them occasionally from the sun till they have taken fresh root in a growing order; and should be continued always in the hot-house or stove, and managed the same as other woody exotics of that department.

CHRYSOCOMA, Goldy-locks.

This genus retains herbaceous flowery perennials for the borders and shrubby ornamental plants for the green-house, all of erect growth, from one to two feet high, ornamented with narrow leaves, and compound floscular flowers.

Class and order, *Syngenesia Polygamia Æqualis*.

Characters.] CALYX, a compound flower in an imbricated cup of many narrow, sharp-pointed scales. COROLLA, composed of many floscular, hermaphrodite, funnel-shaped florets, five-parted at the brim. STAMINA, five filaments, and cylindrical antheræ. PISTILLUM, an oblong germen, slender style, and two depressed stigmas. PERICARPIUM, none. SEMINA, a single seed, crowned with down, to each floret.

The first species is an herbaceous, fibrous-rooted, very flowery perennial.

1. CHRYSOCOMA Lincolns.

German Goldy-locks.] Chrysocoma with upright, round, robust, annual stalks, a foot and half or two feet high, garnished with many long, narrow, smooth leaves, and the upper parts dividing into many foot-stalks, each supporting a head of bright yellow flowers, the whole forming a sort of umbel, appearing

appearing in July, and ripen seeds in autumn.

The two following are dwarf shrubs of the green-house.

2. CHRYSOCOMA, *Comaurea*.

Shrubby Greater African Goldy-locks.] Chrysocoma with a shrubby stem, divided into a slender branchy head two feet high, garnished with numerous, narrow, running leaves, each having a leafy appendage detached from the back part along the stalk, and pale yellow flowers on slender naked foot-stalks from the ends of the branches, all summer and autumn.

3. CHRYSOCOMA *cernua*.

Nodding-flowered Shrubby Goldy-locks.] Chrysocoma with a shrubby stalk, divided into a branchy head, a foot and half high, garnished with short, narrow, hairy leaves, and pale yellow flowers, nodding on one side, appearing from the beginning of summer till autumn.

The first species, *German Goldy-locks*, flowers very ornamentally about six weeks, and succeeds in any of the compartments of the pleasure-ground; its propagation is by dividing the roots any time in open weather from September till March, or it may be raised from seed in a bed of light earth in March or April.

The two shrubby sorts must be kept in pots, and placed in a green-house in winter.

They are easily propagated by cuttings, in pots of light rich earth in spring or summer, which, if plunged in a little heat, or closely covered with a hand-glass about a month, they will readily grow.

CHRYSOPHYLLUM (*Golden-leaf*) Star Apple.

Of this genus are retained in our stoves two species of West-India trees of largish and middling growth, ornamented with ovate, downy, and smooth leaves; and monopetalous, bell-shaped flowers in bunches at the sides and ends of the branches, succeeded by large, globular fruit of the berry kind.

Class and order, *Pentandria Monogynia*.

Characters.] CALYX, small, five-parted, permanent. COROLLA, monopetalous, bell-shaped, five-parted into roundish, expanded segments. STAMINA, five awl-shaped, converging filaments, with roundish twin, incumbent antherae. PISTILLUM, a roundish germin, short style, and obtuse, subquincifid stigma. PERICARPUM, a large, roundish, ten-celled berry, having compressed hard seeds deposited singly in the cells.

The species are,

1. CHRYSOPHYLLUM *Cainito*.

(*Cainito*)--or *Golden Broad-leaved Star-Apple*.] Chrysophyllum with a woody, branching stem, growing many feet high in the Indies, having spreading, slender, declining branches, garnished with ovate, striated leaves, downy underneath, fatty and gold-coloured: and bunches of flowers succeeded by large, globular, eatable fruit, in the West-Indies.

Varieties.] With reddish fruit—Purple fruit—Blue fruit—Small-leaved.

2. CHRYSOPHYLLUM *glabrum*.

Smooth-leaved Star-Apple, or Mexican Med-lar.] Chrysophyllum with an upright stem and branches, growing twelve or fifteen feet high, ovate, acute, entire leaves, smooth on both sides, shining; and small, blue, eatable fruit, in its native country, roundish-olive-shaped, the size of a damson.

Both these species of Star-Apple are fine evergreens, and retained in many of our curious stove collections for the singular beauty of their leaves, which are more particularly striking and beautiful in the first sort; they rarely ever flower in this country; but in both the species their shining foliage, of remarkable beauty, effects a fine variety among other exotics of the stove or hot-house, in which they must be always retained, and kept in pots of light mellow earth.

They are propagated by seeds, procured from the West-Indies, &c. which, as soon as obtained, sow in pots of light, rich earth, and plunge in a tan or other hot-bed, or in the bark-bed of the stove, &c. and when the young plants are advanced about three inches high, plant them singly in small pots, watered, and replunged into the hot-bed; giving occasional shade from the sun till fresh rooted, and moderate waterings; continuing them in the hot-bed or bark-bed till September or October; then, if in a detached hot-bed, should be removed in their pots to the hot-house constantly to remain, and have the management of other similar exotics of that department: in which, when of some advanced growth, will require shifting into larger pots of a moderate size; and they will here make a singularly fine appearance in their very beautiful leaves, at all times of the year.

CHRYSOSPLENIUM, *Golden Saxifrage*.

A genus of hardy, low-growing, herbaceous plants, producing ornamental, apetalous, yellow flowers.

Class and order, *Decandria Digynia*.

Characters.] CALYX, coloured and cut in four or five segments, which spread open. COROLLA, none. STAMINA, eight or ten, erect, very short filaments, and topped with simple antherae. PISTILLUM, a germin in the bottom

of

of the cup, supporting two subulate styles. PERICARPIUM, a double-beaked, two-valved, unilocular capsule, containing many small seeds.

The species are,

1. *CHRYSOSPLENIUM alternifolium*.

Alternate-leaved golden Saxifrage.] Hath a stalk five or six inches long, leaves roundish hairy, notched round their edges, on long foot-stalks, and of a pale green, and placed alternate: the flowers grow on short pedicles, in small clusters, of a bright yellow colour.

2. *CHRYSOSPLENIUM oppositifolium*.

Opposite-leaved common golden Saxifrage.] Hath roundish opposite leaves, on short foot-stalks; the flower-stalks arise about four inches; the flowers are small, grow in the axæ of the leaves, and are of a gold colour.

These plants grow best in shady places, and are propagated by parting their roots either in autumn or spring.

CICHORIUM, Succory, or Endive, (*Endivia*.)

This genus furnishes but one useful species, an herbaceous esculent of the kitchen-garden, valuable both as a salad and a culinary herb, of which there are three eminent varieties.

Class and order, *Syngenesia Polygamia Æqualis*.

Characters.] **CALYX**, a compound flower, having a calyculated, scaly, imbricated, cylindrical, general cup. **COROLLA**, many hermaphrodite, plane, tongue-shaped, five-parted florets, placed in a circle. **STAMINA**, five filaments, and cylindric-pentagonous antheræ. **PISTILLUM**, an oblong germen, slender style, and two revolute stigmas. **PERICARPIUM**, none. **SEMINA**, a single seed to each floret, lodged in the calyx.

There are three species in the whole; the Wild Succory of the fields—the Prickly Succory of Sicily—and the cultivated Succory or Endive of our gardens; but the two former have no merit as garden-plants.

The Succory of our gardens is,

CICHORIUM Endivia.

Endive, or Garden Succory.] Cichorium with a spindle-shaped, fibry root, crowned by a compact cluster of numerous, oblong, spreading leaves, close to the ground, from about six to ten or twelve inches long, near half as broad, in some sorts fringed and curled, others plane and entire, and in the centre an upright branchy seed-stalk a yard high, garnished with small leaves, and solitary blue flowers, succeeded by plenty of seed.

Varieties are,

Green Curled Endive—hath numerous, green, finely fringed, and curled leaves, forming a circular cluster close to the ground,

twelve or fifteen inches diameter; the centre leaves many, very closely placed, and grow to a large, compact, finely-blanced, white heart. This is considerably the finest variety of Endive for general culture, both for salads and culinary purposes, and is the hardiest to stand the winter. But the great article is, to have the true sort; for some have long, irregular, thinly-placed leaves, very little curled, and the heart open and loose; therefore, in saving seed, be particular in marking the fullest-leaved, most curly, regular, bushy plants, that bottom well, and have the heart perfectly full, close, and white.

White Curled Endive—A smaller plant, having white, very fringy, curled leaves, in a circular cluster close to the ground, ten or twelve inches diameter, very full and close in the heart.

Broad-leaved Batavia Endive—hath long, broad, plane, more erect, entire leaves, of a whitish-green colour, thick and crisp like coss-lettuce; but is more proper for culinary uses than salads, nor is it so hardy to stand the winter as the green-curved variety; so should be cultivated only for autumn service, i. e. to use in August, September, October, and November.

All the varieties may be considered both as annuals and biennials. Considered as annuals, that if sown early in spring, or even any time before the beginning of June, the plants very commonly fly up to seed the same summer, in their minor, or half-grown state, and perish in autumn. As biennials, that if sown in June or July, the plants acquire perfection in autumn, continue till the spring following, then shoot up stalks for flower and seed, and soon after perish; so, at most, they are never more than biennial.

It is the inner leaves of all the varieties that are the useful parts, which, when blanched white, to render them crisp and tender, and to reduce them from a naturally strong, to an agreeably-mild bitter taste, are then fit for use.

They are valued chiefly as principal furniture for autumn and winter salads, and for some culinary uses; and their general season of perfection is from the latter end of August until Christmas, or longer, according to the temperature of the season; though the curled kinds generally resist the frost of our ordinary winters, and if a late crop is allotted a warm, dry situation, the plants will remain in tolerable perfection till March or April.

Propagation and Culture.

The propagation of each variety is by seed annually in an open spot of ground, from which the plants are to be transplanted a foot distance,

distance, in open beds or borders, to remain to grow to full size, when their leaves are to be tied together, to promote their blanching white.

The principal season for sowing these seeds is from the beginning of June to the end of July; and to have a regular supply of plants, it is proper to perform three different sowings at about three weeks or a month's interval, observing, that if sown before the first week in June, the plants are apt to run to seed the same year without acquiring perfection; and, if sown later than July, they have not time enough to grow to any tolerable size before the approach of winter; however, where the plants are required as early as possible, you may perform an earlier sowing; but the earliest should never be before the middle of May; and even that sowing is apt to fly up soon to seed, so must never depend on this sowing for a main crop; therefore, for the general autumn, winter, and spring crops, I advise the first sowing to be in the first week in June, the next, a larger sowing, in the third week in the same month, and the third and last principal sowing, about the fifteenth or twentieth of July; or may also perform a smaller sowing the latter end of July or beginning of August, for a late crop the end of winter and in spring: and each of these sowings will afford two or three different drawings or transplantings; for it is eligible to make five or six plantations at least, at different intervals, whereby a regular succession of good Endive will be obtained from August until March or April.

All the sowings should be performed in an open exposure, and the richer the ground the better, which, after being dug, form into a bed or beds four feet wide; directly sow the seed by broad-cast moderately thin, and tread and rake it in with a large rake.

The plants will come up in ten or twelve days, when, if the weather is dry, give occasional waterings; keep them clean from weeds; and where they rise in clusters, thin them to two or three inches distance, that they may not draw each other weak; and, when about a month old, transplant the largest in the following manner.

When the plants of each sowing are from three or four to five or six inches high, they are of a proper size for planting out, which should be at once in the place where they are finally to remain; they should be allowed a spot of as rich ground as you can afford; and an open exposure is most eligible for the main crops that are planted out in June, July, and August; but for those intended principally for the latter end of winter and spring service

which are planted out in September and October, &c. should be set near the shelter of a South wall or hedge. At each time of planting during the warm season, it would be of much advantage to take every possible opportunity of showery or moist weather, otherwise must water plentifully: let the ground be then neatly dug one spade deep; divide it into four feet wide beds, and rake the surface smooth; then draw out a quantity of the stoutest plants from the seed-bed, with their roots as entire as you can; and if the plants have run up with long leaves, trim their straggling tops and ends of the roots, then plant them by line and dibble, four rows in each bed, and a foot distance in the rows; or, without forming the ground in beds, they may be planted in continued rows that distance; and in either method, that the plants may have more room to spread, set them in the quincunx order (see *QUINCUNX*), finishing the work with a good watering, unless the weather is very showery, when you may spare yourself that trouble, though, at any rate, a little water at planting settles the earth close to their roots, and is of much advantage; and if the weather is dry, the waterings should be repeated every other day for a week, or till the plants have taken root.

In this manner it is advisable to make a fresh plantation every fortnight or three weeks, from June to the middle or end of September; by which practice you will obtain a regular succession of Endive in due perfection from August till the following spring, proper either for family service, or for market.

When there is a necessity of planting any out in very dry weather, it is proper to draw flat shallow drills a foot distance; so set the plants therein a foot asunder, that when water is given, the drills will detain it about the plants, and the earth will retain a moistness longer than the level ground.

But it would likewise be advisable, in the late-raised Endive, to have some planted for winter-standing, in the latter end of September or in October, in a warm, dry, raised border, under a South wall, &c. five or six inches asunder, in which, that the plants, by standing as dry and warm as possible, may have the better chance of continuing the winter more effectually for a succession supply the latter end of that season and the spring, than late crops planted in a common, open, low, or moist situation, which are more liable to rot by wet or be cut off by frost; and in severe weather, might be more readily defended by a covering of straw-litter, &c.

Or likewise, for late plants, in October or beginning of November, it would be eligible to

to form a South sloping bed or bank four or five feet, raised two feet high or more, perpendicularly, in the back or North side; from which, making the whole front of the above width, steeply-sloping to the South sun; and in which sloping side, to plant a quantity of stout young Endive, either from seed-beds or closely transplanted beds or borders, inserting them therein by dibble about three or four to five or six inches distance, according to the size of the plants; and as they will thus remain drier and warmer to stand the winter than on level ground in a common exposure, in which, sometimes, in very wet or unfavourable winters, the Endive is liable to rot off in the course of that season, they will have a greater chance of surviving more effectually in a continuing growth more freely in winter during open weather; and when frosty, or great rains, or snow, they might be defended with some spare garden frames and glasses, or occasionally covered thick with dry, long straw-litter, or dried fern, &c. and thereby in the whole the plants would be better preserved for late winter and early spring supply: and if they mostly survive and stand too close, some in February might be thinned out and planted in a warm border: and all of which, according as they attain some tolerable size in growth, should be blanched or whitened, as hereafter explained.

As to the general culture of the different principal crops, keep each plantation clean from weeds, by hoeing or hand-weeding between the plants carefully in dry weather; and when the plants are nearly full grown, close and full in the heart, a quantity of the largest should have their leaves tied up for blanching, which is to be repeated in successive order; and the following are the directions.

Method of Blanching the Plants.

The great excellence in good Endive is to have the inner parts of the plants finely whitened or blanched, without which they would be tough and disagreeably bitter; the plants of themselves naturally incline to whiteness in the hearts, but this may be greatly promoted and improved by art, when the plants are arrived at full growth.

Different methods of blanching or whitening Endive are practised, such as—tying up all the leaves of each plant close together, being the principal and most generally effectual method—taking up the full-grown plants from level ground and replanting them into the sides of raised ridges almost to their tops, being sometimes practised in winter-blanching—laying plane tiles or boards flat ways upon the plants, sometimes practised in summer and

autumn, though this method is not so effectual for general practice in blanching them in a regular growth, as tying up the leaves.

So that, of the above different methods, the tying up the leaves in a regular manner whitens the Endive more equally and effectually in an upright, regular, full growth, generally blanching in tolerable perfection in about a fortnight, and is the principal eligible method in practice for blanching the general summer and autumn crops of Endive from July or August, September and October, till November or December.

Then sometimes in the two last mentioned months, November and December, when we may expect sharp frosts commencing, or very wet weather, or sometimes the ground wherein the winter Endive is growing becoming very wet by rains, &c. likely to rot the plants, which casually happens at this season, a quantity of full plants being then occasionally transplanted, in open, dry weather, into the sides of raised ridges of light, dry, mellow earth, inserted horizontally almost to the tops of the leaves, in order thus both to secure the plants more effectually from the power of frost, and to preserve them drier, not so subject to rot, as they sometimes are on level ground in very moist soils in winter; and will thereby have a greater chance of whitening in some tolerable perfection, especially if the ridges are occasionally covered in frosty weather with a proper thickness of straw-litter, &c. — or this would also be very necessary to some of the principal plants remaining in the beds or borders, &c.

As to blanching Endive by means of boards or tiles laid flat-ways on the plants, it will whiten them tolerably in the hearts; but it greatly cramps their growth, so as they do not blanch so effectually in that regular manner as by tying the leaves together in an upright position; and is therefore not so eligible for any general practice or only occasionally to a few early plants of the summer or autumn Endive, especially the white, curled sort; or occasionally the green.

However, in regard to the proper period to begin to prepare for blanching the general crops of summer and autumn Endive by tying up the leaves, &c. it is according as the plants of the different crops attain nearly their full growth, in July or August, September, October to November, &c. being considerably advanced in a large, full expansion of leaves in a close, stocky cluster, the hearts full and bushy, when should proceed in tying up a proper supply of the largest, full-hearted, stocky plants, about once a week or ten or

twelve days, in quantity according to the demand either for the service of a private family, or in larger supplies for market; generally observing, this work should be performed principally in dry days, and when the plants are also tolerably dry; and being furnished with some strong bass strings or small osier twigs, then gathering up all the leaves of each separate plant regularly in the hand, detaching any that are damaged or decayed, and with the above ligatures tie the leaves moderately close together, a little above the middle, or within two or three inches of the top; one tying, or bandage to each plant, and not bind them too strait; and in this manner proceed in the whole, at different times, as above intimated, during the autumn months, and part of winter, as long as open, tolerably dry weather continues; thereby obtain a constant supply of well-blanch'd Endive, throughout the proper season.

In ten or twelve days some of the forwardest plants of each tying will begin to whiten, or probably some moderately blanch'd; but in a fortnight or three weeks at most, will be blanch'd in good perfection.

As the Winter standing Endive is subject to be much cut by severe frost, or rot off in very wet seasons, in moist soils, it would be proper at the approach of rigorous weather to cover some of the principal crops with long litter, peas-straw, dried fern, &c.

To blanch Endive in raised ridges of light dry earth, is sometimes practis'd in winter, as before observed, when expecting frost setting in, or in very wet weather, or the ground exceedingly wet, and by transplanting a quantity into the sides of the ridges almost to their tops, they being more out of the power of frost, and the effects of too great moisture, have sometimes a better chance of whitening in some tolerable perfection; though it is not always effectually successful, as they are sometimes liable to rot by the moisture of the earth; however, it is proper to try the chance occasionally, and more successfully if defended from frost and excessive rains.

The method is,

In November or December, when apprehensive of bad weather approaching, prepare one or more ridges of earth in some light mellow ground, as dry as possible, raised two or three feet high, ranging sideways to the sun, and as steep as possible, that the falling wet, &c. may run quickly off; then on a dry day in open weather, dig up a quantity of good stocky Endive, with their full roots, divest-
ing the plants of decayed or damaged leaves,

and if rather wet in the heart, carry them into some dry place under cover, and laid tops downward for a day or two to drain off the moisture, but if quite dry, may replant them at once into the ridges, gathering the leaves of each plant close together, and insert them horizontally into the south side of the ridge of earth, almost to their tops; they will thus strike root, and if the earth is tolerably dry, and the plants covered from severe frost, &c. if it happens, they will have a chance of blanching more effectually than in the open level ground at this season; or where the slope of the ridge could be defended with some spare garden frames and glasses in bad weather, it would be of greater advantage.

Or some light dry earth might be laid in a ridge or heap, under a deep garden frame, or in some covered place, and a quantity of Endive deposited therein, as above; and, if in a frame, defended with the glasses in bad weather, and also, in either place, with straw litter occasionally, to exclude frost.

In very severe weather, it would also be of much advantage to bestow covering on some of the best plants in the full ground; and where there are only a few for family use, it may be more easily effected either by mats or dry long litter, being careful to remove the covering as soon as the weather alters mild.

Saving the Seed.

Particular attention is necessary in saving Endive-seed, to mark for that purpose some of the very best sorts of each variety, for the plants are very subject to degeneracy.

Therefore, in October or November, place some sticks as marks to some of the most stocky full plants, which may either remain, or in March be transplanted into a sheltered sunny situation, in rows two feet distance, and eighteen inches asunder in the lines; or if planted in a single row against a South wall, pale, or hedge, it would be convenient for supporting their seed-stems. They will shoot up their stems in April or May, which early in June will require support, either of a stout stake to each plant, or, if situated against a wall, &c. the stems may be fastened thereto by a line of packthread; the seed will ripen in July and August, having attention to cut off the branches from time to time as the seed acquires maturity, which, according as it is properly dried in the sun, beat out on cloths, and put it up for use in bags or boxes.

CIRRHUS, a Clasper or Tendril; that fine spiral string issuing from the branches, foot-stalks, and leaves, of many sorts of trailing and climbing plants, by which they fasten themselves to other bodies for support.

A Clasper

A Clasper, is one of the seven species of *Fulcra*, or props or supports of plants. See **FULCRA**.

Claspers are of singular use to most of the trailing and climbing tribe, in assisting them to climb and support themselves, as they mostly have long, slender, fragile stalks and branches, which would trail on the ground, and be liable to be displaced, and frequent breakings, unless by means of their tendrils, which either twine round any thing in their neighbourhood; as for instance, those of peas twine round sticks or bushes, and thereby mount their stalks and branches several feet high; and those also of the vine and passion-flower, and of many others, twine round their own, or neighbouring branches, or any other contiguous support; and some climbers emit Claspers, which plant themselves like roots in the adjacent walls, or the bark of neighbouring trees, as exemplified in ivy, *Virginia Creeper*, the *Bignonia radicans*, the *Solanum Dulcamara*, and many other sorts; their stalks thereby mounting thirty or forty feet high. See **CLIMBER**.

As to the situation of Claspers on the respective plants, they sometimes are placed opposite to the leaves, as in the vine; sometimes at the side of the foot-stalk of the leaf, as in the passion-flower; and sometimes proceed from the leaves themselves, as in the pea, and are either simple, or of one string, as in most Cirrhous plants; or compound, i. e. of two or more, as in *Lathyrus latifolius*, broad-leaved or common everlasting pea.

CINCHONA, Jesuits' Bark.

A genus of tender exotic trees of South America, and the West India islands, garnished with ovate, oblong, and lanceolate leaves, and mostly terminal panicles of monopetalous, funnel-shaped flowers, succeeded by two-parted capsules, with oblong, compressed seeds, in their native country, where the trees are of great value for the medicinal efficacy of their bark, commonly called Jesuits' or Peruvian Bark; they are rare in this country, in which some are retained in curious stoves for variety.

Class and order, *Pentandria Monogynia*.

Characters.] **CALYX**, monophyllous, five-dented, permanent. **COROLLA**, monopetalous, funnel-shaped, five-parted above, with a long tube below. **STAMINA**, five filaments in the middle of the tube; and linear, erect antheræ. **PISTILLUM**, a turbinate germen, inferior, single style, and thick, bifid, or entire stigma. **PERICARPIUM**, an oval capsule, bipartite, crowned with the calyx, and containing many oblong compressed seeds.

There are several species; the principal sort in our stoves is,

CINCHONA *officinalis*.

Officinal Common Cinchona, or Jesuits' Bark.] Cinchona with an upright branching stem, growing many feet high, having a purplish-brown bark; ovate-oblong, or lanceolate, smooth leaves, and terminating panicles of flowers.

2. CINCHONA *caribea*.

Caribbean, Shrubby Cinchona.] Cinchona with a shrubby stem branching ten or twelve feet high; ovate, lanceolate, acuminate, smooth leaves; and axillary peduncles, one-flowered.

3. CINCHONA *pubescens*.

Pubescent Cinchona.] Cinchona with a branching stem; ovate, obtuse leaves, elongated at the base, downy underneath; and terminating, brachiate panicles of flowers.

4. CINCHONA *corymbifera*.

Corymbous-Flowering Cinchona.] Cinchona with an upright stem, branching six or eight feet high, in a spreading growth; oblong-spear-shaped, acuminate, smooth leaves, and axillary corymbs of white flowers.

Of the above species, the first is the principal sort in this country retained in stoves for curiosity and variety: the others are of the same temperature; all the sorts being natives of the hot parts of South America, as Peru, and the West Indies, &c. and when cultivated here, must all be kept in stoves; planted in pots of light loamy earth; and treated as other woody exotics of the same quality.

They are propagated by seeds procured from the countries of their native growth, and must be sown in pots of light earth, and plunged in a bark-bed; and when the plants are come up about three inches high, transplant them singly into small pots of light earth, and plunged in a bark-bed, shaded from the sun till fresh rooted, and give frequent light waterings; managing them afterwards as before-mentioned.

Likewise try their propagation by layers and cuttings, assisted by the heat of the bark-bed, as in the seedling plants.

CINERARIA, Sky-Flower.

This genus consists of several herbaceous and shrubby green-house exotics, with compound radiated flowers.

Class and order, *Syngenesia Polygamia Superflua*.

Characters.] **CALYX**, a polyphyllous general cup, of equal segments. **COROLLA**, compound and radiated, having numerous hermaphrodite florets in the disk, and ligulate,

dentated female florets, in the radius. STAMINA, five short slender filaments, with cylindric antheræ. PISTILLUM, an oblong germen, filiform style, crowned with two erect stigmata. PERICARPIUM, none. SEMEN, a single seed in each floret.

The species most material are,

1. CINERARIA *amelloides*.

Amellus-like, Blue-flowered Cineraria.] With ovate, naked leaves, and one-flowered peduncles.

2. CINERARIA *lanata*.

Woolly Cineraria.] With roundish, heart-shaped, five or seven-angled leaves, woolly underneath, and purple flowers.

3. CINERARIA *maritima*.

Sea Ragwort.] With woolly, winged leaves, and flowers growing in a panicle.

These shrubs make a pretty appearance; they require sheltering from the frosts in winter, and may easily be propagated by seeds or cuttings, in spring or summer.

CISTUS, Rock-Rose, (*Cistus*).

This genus furnishes beautiful shrubby evergreens for the pleasure ground and greenhouse, adorned with oblong spear-shaped leaves, and numerous quinquepetalous white and purple flowers.

Class and order, *Polyandria Monogynia*.

Characters.] CALYX, five roundish, concave leaves. COROLLA, five roundish, large, plane, patent petals. STAMINA, numerous capillary filaments, and roundish antheræ. PISTILLUM, a roundish germen, single style, and plane orbicular stigma. PERICARPIUM, an oval, covered capsule, and numerous, small, roundish seeds.

There are numerous species of *Cistus*, the greater part of which are of the shrub kind, and there are some of herbaceous growth; but those that merit notice in gardening are mostly shrubby evergreens, very floriferous and ornamental.

The species of our gardens are,

1. CISTUS *populifolius*.

Poplar-leaved Cistus.] *Cistus* with a shrubby stem, branching each way five or six feet high, garnished with large, heart-shaped, pointed, smooth leaves, having foot-stalks; and at the sides and ends of the branches numerous large white flowers.

2. CISTUS *ladaniferus*.

Ladanum-bearing, or Spanish Gum Cistus.] *Cistus* with a shrubby strong stem, branching from the bottom upward, forming a bushy head five or six feet high, adorned with spear-shaped leaves, smooth and green on the upper side, whitish and veined below, standing on short foot-stalks joining at their base round

the branch like a sheath; and numerous large purplish flowers at the sides and ends of the branches.

Varieties.] *Willow-leaved Ladaniferous Cistus*—having narrow spear-shaped leaves, and large white flowers, having a purple spot at the base of each petal—and with entire white flowers.

3. CISTUS *albidus*.

White Downy-leaved Cistus.] *Cistus* with a shrubby stem, branching erectly from the bottom five or six feet high, having woolly branches, garnished with oval-spear-shaped, trinervous, white, downy, close-fitting leaves; and all the branches terminated by large bright purple flowers.

4. CISTUS *creticus*.

Cretan Gum Cistus.] *Cistus* with a shrubby stem, branching laterally three or four feet high: oval-spatulated, enervous, rough leaves, on short foot-stalks; and deep purple flowers on foot-stalks, at the ends of the branches.

5. CISTUS *monspeliensis*.

Montpelier Gum Cistus.] *Cistus* with a shrubby stem, branching laterally from the bottom upward, three or four feet high; spear-shaped, trinervous, hairy, close-fitting, dark-green leaves; and from the ends of the branches, long naked foot-stalks, sustaining many large white flowers.

6. CISTUS *pilosus*.

Hairy Round-leaved Cistus.] *Cistus* with a shrubby, strong, rough stem, branching to a large bushy head, a yard or four feet high, garnished with oval-roundish, hairy leaves growing opposite on short foot-stalks; and many large purple flowers from the sides and ends of the branches.

7. CISTUS *incanus*.

Hoary-leaved Cistus.] *Cistus* with a shrubby stem, branching to a large, bushy head three or four feet high; spatulate-shaped, hoary, rough, close-fitting leaves, the lower ones oval and united at their base, the upper ones spear-shaped and distinct; and all the branches and shoots terminated by large purple flowers.

Varieties.] Long-leaved Hoary *Cistus*—Roundish-leaved Hoary *Cistus*—Large Hoary-leaved *Cistus*.

8. CISTUS *crispus*.

Waved Curled-leaved Cistus.] *Cistus* with a shrubby stem, diffusing horizontal branches, forming a spreading head a yard or more high; spear-shaped, waved, bending, hairy leaves, in pairs opposite; and from the axillas of the leaves, many white flowers on naked foot-stalks.

9. CISTUS *salvifolius*.

Sage-leaved Cistus.] *Cistus* with a shrubby, slender,

slender, smooth stem, a yard high, branching horizontally and spreading, garnished with small, oval, hairy, petiolated leaves; and from their axillas, white flowers on long naked foot-stalks.

10. *Cistus laurifolius*.

Bay-leaved Gum Cistus.] *Cistus* with a shrubby, strong stem, branching erectly, forming a head five or six feet high; oblong-oval, trinervous, petiolated leaves, smooth and green above, their foot-stalks joined at the base; and from the sides and ends of the branches, large white flowers on branching foot-stalks.

11. *Cistus halimifolius*.

Sea-Purflane-leaved Cistus.] *Cistus* with a shrubby stem, branching erectly from the bottom upward, forming a bushy head four feet high, adorned with oblong-oval, very white, hoary leaves, in pairs opposite; and at the sides and ends of the branches, very long, branching, naked foot-stalks, supporting large, bright, yellow flowers.

Varieties.] Broad-leaved *halimifolius Cistus* — Narrow-leaved *halimifolius Cistus*.

The flowers of all these species are composed each of five large, round, spreading petals (see the *Characters*); and are extremely numerous on the plants, appearing principally in May, June, and July; and many of the sorts afford plenty of ripe seeds.

The leaves of these shrubs exhibit great variety in the different species, being of very different shapes, sizes, and of many different shades of green and white, and which, in most of the species, are covered with a clammy or gummy substance, of a strong balsamic scent, of which is prepared the ladanum of the shops; hence several of the species are entitled Ladaniferous, or Gum-bearing *Cistus*, which they impart more abundantly in the summer months, and is collected for use in the countries where the shrubs naturally grow.

They are natives principally of the southern parts of Europe, but succeed here in the open air the year round.

All the species are beautiful evergreen shrubs, generally very branchy quite from the bottom, forming diffused heads, and are all very ornamental in gardens, not only as evergreens, effecting a fine variety at all seasons, with their leaves of different figures, sizes, and shades of green and white, but also as first-rate flowering shrubs, being very profuse in most elegant flowers, which though of only one day's duration, there is a daily succession of great numbers of new ones, continued a month or six weeks on the same plant; and when there are different species,

they will exhibit a constant bloom near three months, and all the sorts begin flowering when little more than a foot high.

They are all hardy enough to prosper in the full ground in any dry soil; and if they have a sheltered situation it will be an advantage, as, in open exposures, they are rather subject to injury from very severe frost; for which reason, where there is green-house room, a plant or two of each sort may also be potted to have shelter in winter, by way of reserve, especially while young.

The more tender sorts are the *Cistus laurifolius*, and *halimifolius*.

Their situation in shrubbery works should be towards the front of the clumps and other compartments, in assemblage with the choicest shrubs of similar growth, dispersing them so as to effect variety, and to have shelter of the other plants; but by no means crowd them.

Let all the sorts assume their own natural growth; that is, never shear or trim them close, but only just shorten or retrench with a knife any particular rambling branch.

Propagation.

All the sorts of *Cistus* are raised by seeds and cuttings, either in common earth, or in a hot-bed.

The seeds produce the handsomest plants, and the time for sowing is March. These seeds may either be sown in a warm border near half an inch deep, and the plants will come up in six weeks; or, to bring them more forward, the seed may be sown in pots, and plunged in a moderate hot-bed, and the plants will appear in less than a month, when they must be afforded the full air in mild weather; and frequent waterings are also necessary to the plants raised in either method, as well as occasional shade from the scorching sun while young: they will grow half a foot high, or more, the same year; but when they are an inch or two high, some may be pricked out to thin them, planting some separately in small pots, others in a rich border, giving occasional shade and water during summer, and in October move the potted plants to a frame to have shelter from frost; all those in the full ground should also be shielded in frosty weather with mats. In spring, those left in the seed-bed should be planted out, and the potted plants shifted into larger pots, in which they may be continued, to have shelter another winter; and in spring following transplant most of them into the nursery, or where they are always to remain.

By cuttings:—their propagation this way may be performed any time from May till August. Chuse cuttings five or six inches long,

long, and plant them in a bed of rich earth, giving occasional shade and water; they will be rooted, and fit to transplant into separate pots in eight or ten weeks, managing them as the seedlings.

If a quantity of cuttings are planted in pots in spring, and plunged in a hot-bed, it will bring them much forwarder.

CITHAREXYLON, Fiddle-wood, or Fiddle-wood.

It furnishes two beautiful evergreen shrubs for the stove, adorned with large oblong leaves, and bunches of funnel-shaped, monopetalous, white flowers.

Class and order, *Didynamia Angiospermia*.

Characters.] **CALYX**, monophyllous, and indented into five parts. **COROLLA**, one funnel-shaped petal, five-parted and spreading at top. **STAMINA**, two long and two short filaments, and didymous antheræ. **PISTILLUM**, a roundish germen, slender style, and headed stigma. **PERICARPIUM**, a roundish, unilocular berry, and two seeds.

The species are,

1. **CITHAREXYLON quadrangulare**.

Quadrangular-branched Citharexylon.] Citharexylon with an upright robust stem, round-quadrangular branches, and cinereous bark; oblong-oval, firm leaves, placed opposite; and at the sides and ends of the branches loose spikes of white flowers.

2. **CITHAREXYLON caudatum**.

Caudated Citharexylon.] Citharexylon with an upright, robust stem, divided into many round branches; oboval, opposite leaves; and long spikes of white flowers at the ends of the branches.

They grow to large trees in America, but appear like shrubs in this country, where they must be always retained in pots, and continued in the stove, except about two months in the heat of summer.

Both the species are propagated by seed procured from America, sowing it half an inch deep in pots of rich earth, and plunge them in a bark-bed.

They may also be propagated by cuttings planted in spring in pots of rich earth, and plunged in the bark-bed.

CITRUS, the Citron-tree, including the *Limon* or Lemon-tree, and *Aurantium*, the Orange-tree.

Former authors on gardening and botany considered the Citron, Lemon, and Orange, as three distinct genera, and treated of them accordingly; but their generical characters being the same, Linnaeus joins them all as species and varieties of the genus *Citrus*.

They are all most beautiful evergreens of

the tree kind, natives of distant warm climates, so are retained here as green-house plants.

Class and order, *Polyadelphia Icosandria*.

Characters.] **CALYX** is monophyllous and indented in five parts. **COROLLA**, five oblong, plane, spreading petals. **STAMINA**, twenty or more filaments, united below into several bodies, and oblong antheræ. **PISTILLUM**, a roundish germen, cylindric style, and globular stigma. **PERICARPIUM**, a large, baccaceous, oval, fleshy-rinded fruit, full of succulent pulp, and divided internally into nine cells, each containing two oval hard seeds or kernels.

There are but three species, each of which admits of many varieties in respect to the properties of their respective fruit, though, according to Linnaeus, the Lemon is only a variety of the Citron; there is indeed but little difference in their general habit, only that the Citron is rather the strongest shooter, the leaves and fruit larger; and the leaves of both these sorts are large and thick, and having linear foot-stalks, are distinguishable from the Orange, whose leaves are rather smaller, and of thinner substance, and have winged foot-stalks (*petiolus alatus*), i. e. a sort of leafy appendage at the base of each leaf.

The species are,

1. **CITRUS medica**.

The Citron-tree.] Citrus with an upright smooth trunk, divided at top into a branchy, strong shooting, full head, from about five to fifteen feet high, adorned with large, oval-spear-shaped, thick leaves, having linear foot-stalks, and numerous flowers from the sides of the branches, succeeded by very large, oblong-oval, pointed, rough, knobbed-rinded fruit.

There are many varieties; the fruit is held to be a sovereign remedy against poison, and is an excellent sweetmeat, for which it is principally esteemed, being rarely eaten raw.

The Varieties of note are,] Citron-tree with four fruit—with sweet fruit—with warted fruit—with long fruit—with recurved fruit—with bloached leaves.

2. **CITRUS Limon**.

The Lemon-tree.] Citrus with an upright smooth trunk, divided upward into a branchy regular head, from five to twelve or fifteen feet high; large, oval-spear-shaped, pointed, slightly sawed leaves, on linear foot-stalks; and many flowers from the sides of the branches, succeeded by large oval fruit, prominent at the top like a nipple.

Varieties of note are,] Lemon-tree with four fruit—with sweetish fruit—with very large fruit, called Imperial Lemon—with pear-shaped

shaped fruit—with furrowed fruit—with clustered fruit—with childing fruit—with whitish fruit—with tricolor-striped fruit—with gold-striped leaves—with silver-striped leaves—with double flowers.

Small American Lemon, called Lime—the tree having somewhat spinous branches, oval entire leaves, and very small four fruit—and with sweet fruit.

3. CITRUS *Aurantium*.

(*Aurantium*)—or *Orange-tree*.] Citrus with an upright trunk, dividing upward into a branchy regular head, from five to ten or twelve feet high; oval-spear-shaped, entire leaves, having winged foot-stalks, and numerous white flowers at the sides of the branches, succeeded by globular fruit, compressed at both ends.

Varieties of most note are,

Seville Orange—A large, rough-rinded, four fruit, of excellent quality for œconomical uses. The tree is a handsome grower, and rather the hardiest of all the Orange tribe, as in this country it shoots freely, produces large and beautiful leaves, and flowers stronger and more abundantly, and generally bears a greater quantity of fruit, than any other sort, and arrives to greater perfection; so these trees should be the most cultivated.

China Orange—The tree has moderate sized leaves, and a smooth, thin-rinded, sweet fruit, of which are several varieties in warm countries, where they grow in the open ground.

Horned Orange—A common-sized tree, producing oblongish fruit, which dividing at the end, the rind runs out into divisions like horns.

Hermaphrodite Orange—A common sized tree, producing fruit partly like an Orange, and partly Citron-shaped.

Willow-leaved Orange-tree—having narrow, spear-shaped leaves—Striped Willow-leaved Orange.

Dwarf Orange-tree, or Nutmeg-Orange—having a low stem, and small bushy head, growing two or three feet high; small oval leaves in clusters; and numerous flowers in bunches, covering the branches, succeeded by very small fruit.

Other varieties are—Silver-striped-leaved Orange - Tree—with gold-striped leaves—with curled leaves—with double flowers.

Of each of the above three species, there are many more less material varieties than are here noticed, in the countries where they grow in the open ground; and the varieties, like our apples and pears, may be multiplied by seed without end; but, like other fruit so raised, it is probable there may not be one in

a hundred worth notice; so that the approved sorts can only be continued with certainty by budding.

4. CITRUS *decumana*.

Great Shaddock Orange.] Citrus with larger upright stem, with many spreading branches in a full head, growing twelve or fifteen feet high, a strong shooter, large, thick, oblong, smooth leaves, having cordate, winged footstalks, the wings very broad, and many white flowers in upright bunches, succeeded by very large globular fruit, with an even, yellowish, thick, fungous rind, and a reddish pulp; some whitish; derives the term Shaddock from a person of that name who first brought it from the East Indies.

The flowers of all the species and varieties are formed each of five spreading petals, appearing here principally in May or June, and the fruit continue setting in June and July, and ripen the year following.

All the sorts are elegant evergreens of the tree kind, obtaining in England from about five to eight or ten feet stature, forming full and handsome heads, closely garnished with beautiful large leaves the year round, and a profusion of sweet flowers, in spring and early in summer, which, even in this country, are often succeeded by abundance of fruit, sometimes arriving to tolerable perfection; but the chief merit of these trees in England is for ornament, which consists not only in their beautiful foliage, but also in the flowers and fruit, and have this peculiar merit, as to exhibit blossom, green fruit in different stages of growth, and full-grown ripe yellow fruit, all at the same time, which, together with their large shining-green leaves, effects a most beautiful contrast, and renders all the sorts very desirable furniture for the greenhouse collection; but the Oranges and Lemons are rather the hardiest, and generally more fruitful here in England than the Citron, and the Seville-Orange most of all, which is the only sort of Orange to be depended on for any considerable quantity of flowers and fruit; the tree being hardiest, retains its fruit in winter better than most of the other varieties.

These trees are all natives originally of India, but have been long retained in our gardens as greenhouse plants; and in the southern parts of Europe, as Portugal, Spain, and Italy, they grow in the open ground like our apple and pear-trees; and from which countries vast quantities of the fruit are imported hither annually; but here in England the trees must always be continued in pots or tubs, to be housed in winter.

They

They all succeed in the open air from the beginning of June until the middle or latter-end of October, and the rest of the year must have the shelter of a green-house; and they prosper in any good garden-mould. See their *General Culture*.

Sometimes Lemon and Orange-trees are planted in the full ground, under shelter, either against a South-wall, having a frame erected in front, sloping to the wall, to contain glasses in winter to defend the trees, as in a green-house; and generally with an internal fire-flue extending the whole length towards the front, by which to communicate the benefit of fire-heat in severe weather to repel the frost; or sometimes, a large, wide, frame building is erected detached, with glasses at top and front, and with internal flues as above; and in which the trees are planted also in the full ground always to remain: defended in winter with the glasses, and occasional fire-heat in the flues, in severe frosts; and in either of which the trees being always in the full ground, their roots having larger scope of growth than in pots or tubs, they generally grow with larger full heads and fruit; the methods of which are more fully explained hereafter.

However, the above methods are only practised occasionally by curious persons who chuse to go to the expense of distinct framework, &c. for that purpose; and the most general method is, to have the trees always in pots or tubs, to move into a green-house in winter, and the full air in summer.

Trees of all these sorts are retained in most of the nurseries for sale, where such persons as are in haste to have a collection may be furnished; the prices from five shillings to as many guineas, according to the sorts, sizes, and properties.

As to the method of raising and management of all the sorts, see the following different articles of their *Propagation*, and that of their *General Culture*.

Their Propagation by Seed for Varieties, and to raise Stocks to bud upon, &c.

All the varieties of this genus were originally obtained from seed; but the only certain method to continue the respective approved varieties is by budding or inarching them on stocks of their own kind, raised from seed to a proper size. See their *Propagation by Budding*, &c.

By seeds, i. e. the kernels of the fruit:—this method of raising these trees is rarely practised in England, except for stocks, on which to bud the different kinds; for although raising the trees entirely from seed, without bud-

ding, is the way to gain new varieties, as observed of peaches and other fruits, they not only require many years' growth before any of them becomes fruitful: but out of numbers so raised, it is probable not a tree of them may produce fruit that possess any good property; but when any new valuable variety is by this means accidentally obtained, it is continued and multiplied by budding it upon stocks, raised from the kernels of any of the sorts of *Citrus*, for they all take upon one another (see their *Propagation by Budding*); and by which practice all the above described varieties are generally increased in our gardens. As the method therefore of raising them entirely from seeds, except for stocks, is both tedious and uncertain; that is, it is tedious, because they are often many years before they arrive to a bearing state, and uncertain, as that, after all the trouble, they perhaps are neither beautiful in their foliage, flowers, nor fruit, compared with those which are budded with the known and approved kinds; so that in this country it is scarce worth practising, unless a few merely for curiosity.

The raising them, however, from the kernel, either to form trees for new varieties, or for stocks to bud upon, is, in this country, performed the most effectually and expeditiously by the aid of a hot-bed, and by which means stocks may be obtained, of proper size for budding, in two years; the following is the method of raising them.

Early in spring procure some kernels, which may be had plentifully from rotten fruits, or others that are perfectly ripened, observing, that for stocks, the Citron, Lemon, and Seville-Orange, as being the freest shooters, are to be preferred, though the Citron is the strongest shooter of the three: sow the kernels in March, in pots of rich light earth, half an inch deep, and plunge them in a hot-bed, under frame and glasses, of dung or tan, but the latter is preferable, giving air, and frequent sprinklings of water. In two or three weeks the plants will come up, being careful to give air and water, and in six weeks or two months more, they will be advanced four or five inches, or more, in height; observing, in the latter end of June, begin to harden them by degrees to the full air, in which let them remain till October, then move them into the green-house, to stand till spring, when, in March or April, proceed to plant them singly in small pots (thirty-twos, or forty-eights), being careful to shake them out of the seed-pots with their roots entire, and having half filled the other pots with light, rich, loamy compost, place one plant in each pot, filling it up over the

the roots with the same sort of earth, and let them be directly watered, repeating it occasionally till fresh rooted; and afterwards treat them as other woody exotics of the green-house, and in two years, the largest of those designed for stocks will be fit to bud.

But, to have stocks as forward and fine as possible for budding, I would advise, where convenient, as soon as they are potted out as above, to plunge them directly in a hot-bed, under a frame and glasses, about three or four months, which will draw them up in height with straight, handsome stems.

A bark-bed would be the most eligible, made either in a glass-pit, or to be covered with a deep frame and lights; so plunging the pots to their rims in the bed, giving occasional shade in the middle of hot sunny days, and fresh air daily, by tilting one end of the lights, more or less, as you shall judge expedient: likewise refresh them frequently with water, and by the middle or end of July the plants will be advanced fifteen or eighteen inches, or near two feet high, observing then to harden them by degrees to the full air for the remainder of the summer; and, by being thus forwarded, those designed for stocks will be in excellent order for budding the next or second year following. See their *Budding*.

But these seedlings may still be more forwarded, and a year or two's growth may be gained by forcing them, as above, the first season. This is effected by pricking out the seedlings the first year they come up, when two or three inches high, in small pots, as above, to be plunged directly either in a bark-bed, or even in a dung hot-bed, covered with old tan eight or ten inches deep for the reception of the pots, made in a bark-pit, or, at least, under some deep frame and glass as before directed; the plants are to be potted singly, according to the former directions, and plunged in the hot-bed, indulging them, as before advised, with occasional shade, fresh air, and water; and by the middle or end of July, they will have advanced to twelve or fifteen inches, or, perhaps, to a foot and half, or near two feet in height; they must then be gradually hardened to the full air, by raising the lights more and more every day, leaving them also up on nights, and at last take them quite off in a cloudy calm day; so let the plants remain fully exposed till October, then move them into the green-house for the winter, and many of them will be in proper order to receive the buds next August; and the following is the method.

Propagation by Budding.

The operation of budding all the sorts of

Citrus is performed in August upon stocks of their own kinds, for all the species and varieties of this genus take freely upon one another, and the budding or inoculation is performed in the common way. See INOCULATION.

But, as already noticed, the Citron, Lemon, and Seville-Orange, being the freest shooters, are generally preferred for stocks; and those of all the sorts are raised from the kernel, as above directed in the *Propagation by Seed*, which, when from about fifteen to eighteen inches, or two feet high, and about as big as a goose-quill, or a little more, are of due size for budding.

As to the buds for budding them, observe to procure cuttings only from bearing free-shooting trees, of the sorts you would increase; young shoots, that are round and plump, must be chosen, and from these take the buds in the usual manner, being careful to insert them in a smooth part of the stock, at about six to ten or fifteen inches, or more, from the bottom, one bud in each stock, tying them properly with a ligature of bass. See INOCULATION.

As soon as the budding is finished, it is proper to remove the plants in their pots into the green-house, or to a glass-case, &c. to defend the buds from wet and drying winds, turning the budded part from the sun; or, where there is the convenience of a spare bark-pit, where the heat of the bark is almost exhausted, may plunge the pots therein two or three weeks, and it will more effectually promote the union of the buds; observing, in either department, to admit air freely, by opening the front glasses, allowing also a slight shade of mats in the middle of scorching sunny days, and supply the pots with water every day or two during the hot weather; in three or four weeks the buds will be united with the stocks, when it is proper to loosen the bandage of each bud, that they may have room to swell; observing, however, that the buds will all remain dormant till spring.

After this there is nothing more required this year but due waterings, only observing, that in case of great rains, it will be proper to retain the plants in the green-house for the remainder of the summer, and until next spring.

In March following, the heads of all the stocks must be cut off slanting close behind the insertion of the bud; after this operation the buds will soon begin to spring, and produce each one shoot, which probably will obtain from about five or six, to eight or ten inches in length the same year; but it is pro-

per to observe, that if they could have the aid of a bark-bed, there will be a chance of having the buds shoot a foot and half, or more, by the end of summer; therefore, where there is the convenience of a bark-pit, or glass-case, or any deep frame, that can be placed on a bark-bed, &c. I should advise by all means to make use of such conveniences for forwarding the first shoot of the buds; so that as soon as the stocks are headed, as above directed, plunge the pots in the hot-bed, and let them enjoy the benefit of air and water, in proportion to the temperature of the bed and weather; likewise occasional shade when the sun is very powerful: here they may be continued, with the above care, till the end of July, when some of the strongest shooters will be advanced near two feet high; and it is then proper to begin to inure them by degrees to the full air, to harden them against winter, that they may be able to live during that season in the green-house, to which they must be removed in October.

As to their culture, in respect to training, you may train each with a stem to what moderate height you think proper, though, when they have formed stems two or three feet high, I would suffer them to branch out towards the top to form a head, which should be permitted to retain their natural growth, unless you shall see necessary to shorten any particular shoots, that they may throw out laterals, to form a fuller or more regular head; likewise to retrench or shorten any very irregular or rambling branch.

For their further management, see their *General Culture*.

Propagation by Inarching.

This method of propagating Citrus-trees was more in practice formerly than since the art of budding them has been so improved, as to form much handsomer trees. See IN-ARCHING.

When it is however designed to propagate by this method, it may be performed upon any sorts of Citrus stocks raised from seed, as before directed, which when of due size, the pots containing them are to be placed upon a sort of stage, or some erection convenient to the head of the trees you intend to inarch from, observing to fix upon some convenient young shoots or branches nearly the size of the stocks, for the purpose of inarching; these are to be inarched in the stocks, as they grow on the trees, in April or May, bending the branch to join the stock, which together, forming a sort of arch, is hence called inarching; inserting one in each stock, and by the end of August following they will be united to the

stock, and may be separated from the parent tree.

But this method of propagating these trees is rather practised by way of curiosity, to raise a few trees to a bearing state in haste, because by inarching a young bearing branch, furnished with fruit, into any of their own stocks, in April or May, it will frequently be united by the following August, and the branch so inarched may be separated from its parent plant, and, being firmly attached to the stock, it then commences a new tree, bearing fruit, raised in the short space of four or five months.

By the same rule you may inarch an Orange into the branch of a Citron or Lemon, or all three upon the same tree, for the sake of variety.

But trees raised by this method never grow so large nor handsome as those raised by budding.

Of managing the trained Trees brought from abroad.

To obtain a collection of large trained trees of any of the sorts of *Citrus* as soon and as cheap as possible, the only way is, to have recourse to those imported from Italy or Portugal, &c. great quantities of trained trees of all the sorts being imported hither from those countries every spring for sale; they come over in chests, without any earth to their roots, having their roots and heads a little trimmed; they are in size commonly from about one inch to two or three diameter in the stem; the stem from two to four or five feet high, with small branchy heads; and by aid of a bark-bed, they readily take root and grow freely, and form as good trees in two years, as we could raise here in fifteen or twenty from seed and budding.

They are commonly sold at the Italian warehouses in London, &c. from about three, four, or five shillings to a guinea a tree, according to their size and properties, and generally arrive for sale early in the spring, and the sooner they are planted after they arrive and are procured, it will be of greater advantage for their renewing growth, in striking fresh root, and producing shoots above the same year early in summer.

In the choice of these trees, observe, they are commonly budded at such height in the stem, as to form heads from about two to four or five feet high; and as they are frequently furnished with two buds, one on each side of the stem, these are what we should chuse, if possible, as they will consequently form the most regular heads.

A bark-bed must be prepared to strike them,

them, either in a glass-case, bark-pit, or some other similar department, where a bed can be made, either in a sunk or raised pit; preparatory to their planting, place the trees half way or more in tubs of water a day or two, to plump their bark and roots, to prepare them for vegetation; then proceed to planting them, first cleaning their roots, and trim them from damaged parts, and all the small dried fibres; likewise wash and clean their stems, and trim the branches of the head to half a foot in length; this done, get the earth and pots; let the earth be rich and moderately light, and the pots proportionate to the size of the roots of the plants; place one tree in each pot, giving water as soon as planted; at the same time, it is of utility to wrap a thin hay-band slightly round each stem, to prevent their outward bark from being parched by the heat of the sun; then let all the pots be regularly plunged to their rims in the hot-bed, prepared, as above, for their reception.

Here they are to remain three or four months; must be frequently, but moderately watered, both at bottom, and over their tops; and as the season advances, and the sun's heat is vehement, it is necessary to shade the glasses a few hours in the middle of sunny days; observing also, when the heads begin to shoot freely, do not omit giving air, which must be gradually increased in proportion to the heat of the season, and advanced growth of the shoots; by the beginning of June the heads will be considerably advanced in shooting, at which period observe, if the shoots are but thinly placed, it is eligible to top them, to promote their emitting laterals to form a fuller head; at this time also admit air freely, to harden the shoots gradually, to prepare the trees for being moved to the full air toward the latter-end of July; they should then be placed in a situation defended from boisterous winds, and the violence of the noon-day sun, to remain till the beginning of October; then to be placed in the green-house for the winter, and managed as the other trees. See their *General Culture*.

General Culture of all the Sorts.

As to the general culture of all these trees, whether raised in England, or procured from abroad, let it be observed, that, as all the three species and their varieties are so nearly alike in their nature, one common method of culture serves for the whole; they all prosper in any common rich earth or compost, and must all be retained always in pots or tubs, for the convenience of moving them to a green-house in winter; or some trees, for variety, may even be planted in the full ground, to be trained

as wall-trees or standards, provided there is a proper frame erected for the support of glass lights, to shield them in winter, and with flues, to make occasional fires in severe weather, but the general part for the green-house.

It is necessary to observe, that all the sorts succeed in the open air here, only from the latter-end of May until the beginning or middle of October; the rest of the year they require shelter of a green-house, &c.

In the green-house, place the tallest trees behind; and the lowest in front; or, where they are all nearly of a height, those behind should be elevated upon stands, so as their heads may form a sort of gradual slope from the front to the backward row, and, if possible, their heads should stand clear of each other. During their residence in the green-house, the principal care is to give air and water, and secure them from frost; fresh air must be admitted freely every day in all mild calm weather, when not foggy or very wet, by opening the windows less or more, from about eight or nine in the morning, till three, four, or five, &c. in the evening, according to the temperature of the day, giving most air in mild sunny weather: waterings will be necessary during their abode here, about once a week, or ten or twelve days, as you shall see proper; and according to the weather and advanced period of the winter or spring, or power of the sun, and at all times, while in the house, be sure to water moderately, for much moisture at this time would occasion their leaves and young fruit, if any, to grow yellow, and very probably to drop. Their other further care in this department is chiefly the washing their heads occasionally from filth and insects, clearing off decayed leaves, and protecting them from frost, by securing the windows, &c. the same as directed for the green-house plants in general. See GREEN-HOUSE PLANTS.

In the open air their culture is—towards the latter end of May, or beginning of June, according to the temperature of the season, begin to move these trees in their pots or tubs into the full air, placing them to adorn any particular part of the pleasure-ground, observing when first brought forth, to wash and clean their heads from dust and other filth they may have contracted in the green-house. During the summer season supply them with water two or three times a week, or oftener, in very hot dry weather, at which time it is proper to lay some mowings of short grass on the surface of the pots or tubs, to preserve the moisture of the earth the better, observing now and then to water all over their heads; with

this care they are to be continued in the open air till October, then remove them into the green-house, and manage them as before. ♣

At any time of the year, when the surface of the earth in the pots or tubs binds, it is proper to stir it an inch or two deep; and if this is done in spring, and the loose earth taken out, adding the same quantity of new, it will be very serviceable.

Shifting the plants into larger pots or tubs, and fresh earth, is necessary every second or third spring at most, and April is the proper season; draw them out of their present pots with the ball of earth entire; let all the outside matted mouldy roots be pared off close, and part of the old earth at top, sides, and bottom, taken away: being then prepared with fresh compost, let the tub or pot be cleaned out, or, if a new larger one is necessary, have that ready, and lay some crooked pieces of tiles over the holes at bottom, and put in some earth; then place the tree in the pot or tub, and fill up the vacancy with more compost, pressing it down on every side, finishing the work with a moderate watering, and retain the plants in the green-house till the end of May or beginning of June.

In those years the plants do not require shifting, it is of much utility to loosen the earth in the top of the pots or tubs, as low as the surface of the roots, and down round the sides; taking out the loosened earth, fill up the pot with fresh compost, and give water directly to settle the earth close.

Any of these trees having thin, straggling, or irregular heads, the way to render them more regular, is to prune all the branches moderately short, nearly to an equal length, in March or April; at the same time shifting the plants as above directed, and they will soon after break forth in the old wood into many young shoots, which you may regulate as you shall see necessary; or, if the young shoots arise thinly, some of the strongest may be topped in June, and they will furnish laterals the same year to fill the head.

But if any appear of a sickly state, having very weak shoots, irregular heads, small ill-coloured leaves, &c. it is advisable to prune the head pretty close, and shift the tree into entire fresh earth; that is, shake all the old earth quite from the roots, then prune off all decayed roots and small fibres, and tip the ends of the roots in general, and soak and wash the whole in water, and then plant it in entire new compost, and directly give water; after this it would be of considerable advantage, where convenient, to plunge them in a bark hot-bed, made either in a glass-case, bark-pit, or even

in the green-house, in which let them remain until July, when they will have made strong shoots, and form a new, full, and regular head, adorned with fine, large, luxuriant leaves.

When any of these trees in pots have obtained a large size, they should be shifted into tubs, hooped with iron hoops, and with two strong hooked iron handles near the top of each tub, to receive poles to lift the trees in and out of the green-house. See SHIFTING, &c.

The flowering and fruit-setting season of all the sorts of *Citrus* is commonly in June and July; they are often very profuse in flowers, particularly the Orange-tree, which, in healthful large trees, are generally greatly loaded with blossom: when they stand very thick, it is eligible to thin them a little, taking off the smallest; and, observing, as the trees continue blowing and setting their fruit for two months, that, when a full crop of fruit is set, it is of benefit to the trees and fruit, to gather off the superabundant blossoms as they are produced, though many permit them to remain for the sake of their ornamental appearance.

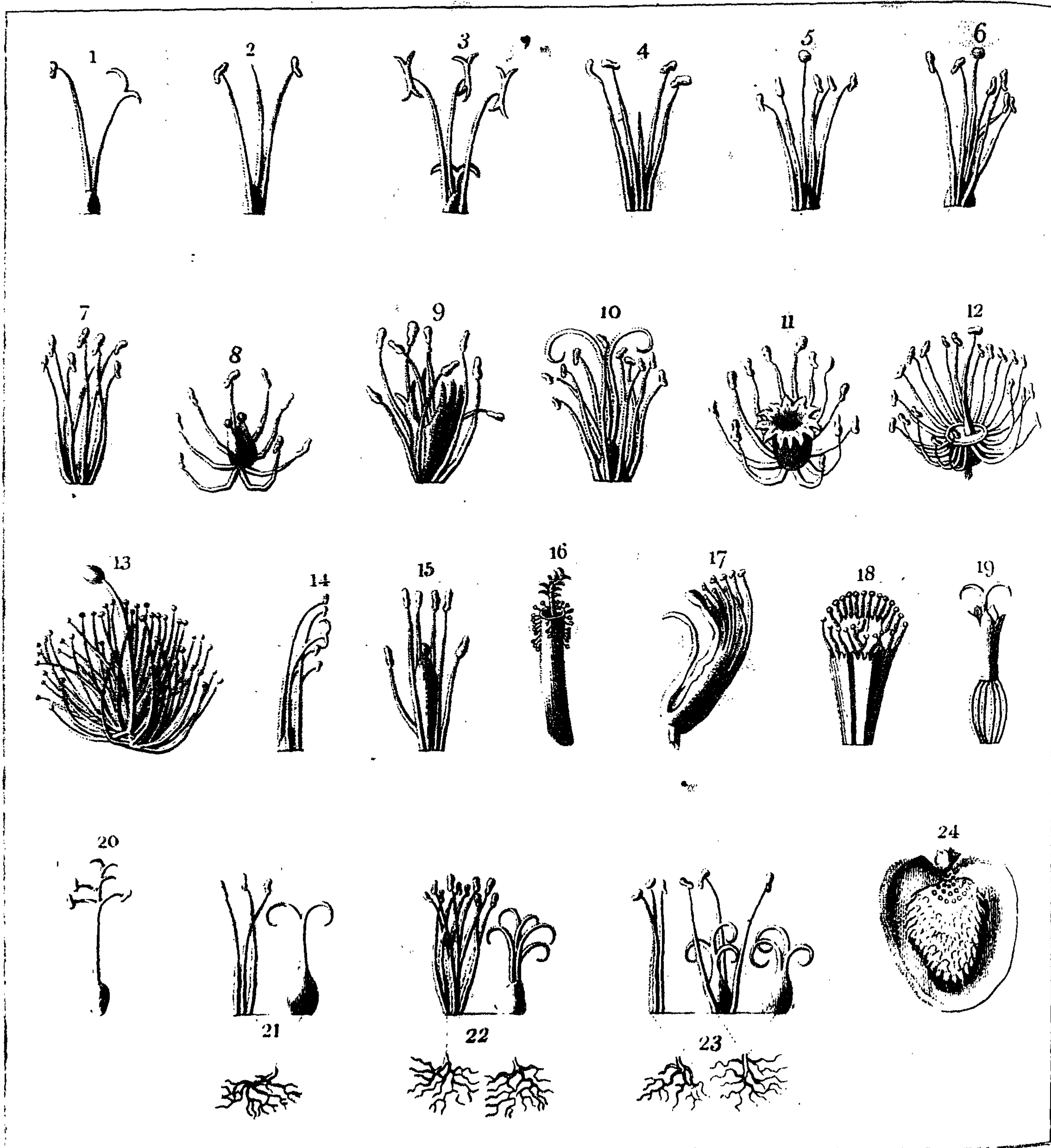
Compost, the most proper for all the sorts of *Citrus*, is that of a light loamy nature, though they will all prosper in any rich garden earth. See COMPOSTS.

Of planting them in the full Ground as Wall and Standard-Trees.

In regard to planting these trees in the full ground, as already hinted, observe, that, when this is intended, there must be frame-erections for the support of glass and other covers, to defend the plants in inclement weather; and in which situation the trees, as having full scope for their roots, generally shoot strong, and produce large fruit, and may either be trained as wall or standard-trees.

A south wall, in a dry situation, is a proper place for training them as wall-trees, against which may be erected wooden frame-work sloping to the wall, either fixed or moveable, for the support of glass frames for winter; likewise, for the greater protection of the trees in severe frosts, there may be a fire-place, with a flue or two, carried along a low wall in the front and ends; so plant the trees in the full border against the back-wall, and train their branches thereto five or six inches distance, observing to defend them with the glasses from October till the middle or end of May, giving air and occasional water as for those in the green-house, and cover the glasses on nights in bad weather, and only in very severe frost employ the flues, if any, with very moderate fires, &c. just to keep out the frost; and in the beginning of June remove the glasses quite away, observing to lightly dig up the borders

CLASSES



two or three times a year, and supply them with necessary manure annually.

To have the trees as standards, a more capacious and lofty glass-case should be erected against the wall, in the manner of a hot-house, but higher; so making a border the whole width and length, planting therein one or two rows of trees lengthways, suffering the trees to run up as standards, giving only some necessary pruning, just to preserve regularity; and as to their protection, &c. manage them as above directed.

In some places there are lofty movable glass-cases, so that two or three rows of trees are planted in a conspicuous part of the pleasure-ground, and in winter the frame is put over them, in summer taken wholly away; so they appear like a little Orange-grove growing in the open ground; and if the trees are well protected by the glasses, and other occasional covers, &c. in winter, they will grow to a much greater height than those in tubs.

CLASSIS, a Class, and in botany is the first and highest division in the arrangement of plants systematically, and by which the whole vegetable kingdom is divided into twenty-four Classes, distinguished by some essential and invariable mark in the fructification, possessed by all the plants of each respective Class; and by the same rule, each Class is subdivided into secondary divisions or orders, the orders into genera, and the genera or each genus into species, and the species into varieties. See **ORDO**, **GENUS**, **SPECIES**, and **VARIE-TAS**.

A Class, therefore, in botany, is defined to be an assemblage or collection of genera, that have some striking mark in common, derived from the fructification, i. e. generative parts of the flower; as, for instance, one stamen, or male organ. Every genus and species, therefore, having flowers with one stamen, belongs to the first Class, (*Monandria*, i. e. of *one* and *a man*); of two stamina, belongs to the second Class, (*Diandria*, i. e. of *two* and *a man*); and of three stamina or male organs, to the third Class, (*Triandria*, i. e. of *three* and *a man*); and so of all the others, as explained under each head in the succeeding arrangement of the twenty-four Classes. Each of these Classes, as above noticed, is subdivided into sections or orders, and that, as the establishment of the Classes, is founded on the number of stamina, or male organs: the orders, or secondary divisions, are founded principally upon the number and situation of the pistil, i. e. style, or female organ, or some other striking part of the fructification; as,

for example, we observed above, that all plants having only one stamen, belong to the first Class, *Monandria*; of which Class there are but two orders, the first of which having one style (*Monogynia*, i. e. of *one* and *a woman*) is *Monandria Monogynia*, one stamen and one style; the second having two styles, (*Digynia*, of *two* and *a woman*) is *Monandria Digynia*, one stamen and two styles: the same is also observable in the second, third, and every succeeding Class, as is sufficiently illustrated in the following arrangement of the twenty-four Classes, and their respective secondary divisions or orders, according to the Linnæan sexual system, as founded on the fructification or sexes of plants. See **SEXUS**.

First Class.

MONANDRIA, (of *one* and *a man*) *one male organ*, comprehending plants with hermaphrodite flowers, having but one stamen, or male organ, and of which there are but two orders, these derived from the number of styles in the plants of each order.

The orders are,

1. **MONANDRIA MONOGYNIA**—one stamen and one style.
2. **MONANDRIA DIGYNIA**—one stamen and two styles.

Second Class.

DIANDRIA, (of *twice*, or *two*, and *a man*) *two male organs*, plants with hermaphrodite flowers, having two stamina, or male organs, and consists of three orders, derived from the number of styles, or female organs, in the plants of each order.

The orders are,

1. **DIANDRIA MONOGYNIA**—two stamina and one style.
2. **DIANDRIA DIGYNIA**—two stamina and two styles.
3. **DIANDRIA TRIGYNIA**—diandrous plants with three styles.

Third Class.

TRIANDRIA, (of *three* and *a man*) *three male organs*, plants having hermaphrodite flowers, with three stamina, or male organs, and consists of but three orders.

The orders are,

1. **TRIANDRIA MONOGYNIA**—three stamina and one style.
2. **TRIANDRIA DIGYNIA**—three stamina and two styles.
3. **TRIANDRIA TRIGYNIA**—three stamina and three styles.

Fourth Class.

TETRANDRIA, (of *four* and *a man*) comprehends plants having hermaphrodite flowers, with four stamina of equal length, and comprises three orders.

The

The orders are,

1. TETRANDRIA MONOGYNIA—four stamina and one style.
2. TETRANDRIA DIGYNIA—four stamina and two styles.
3. TETRANDRIA TETRAGYNIA—four stamina and four styles.

Fifth Class.

PENTANDRIA, (of *five* and *a man*) *five male organs*, comprises plants having hermaphrodite flowers, with five stamina, and consists of six orders.

The orders are,

1. PENTANDRIA MONOGYNIA—five stamina and one style.
2. PENTANDRIA DIGYNIA—five stamina and two styles.
3. PENTANDRIA TRIGYNIA—five stamina and three styles.
4. PENTANDRIA TETRAGYNIA—five stamina and four styles.
5. PENTANDRIA PENTAGYNIA—five stamina and five styles.
6. PENTANDRIA POLYANDRIA—five stamina and many styles.

Sixth Class.

HEXANDRIA, (of *six* and *a man*) *six male organs*, plants with hermaphrodite flowers, having six stamina, and comprehends five orders.

The orders are,

1. HEXANDRIA MONOGYNIA—six stamina and one style.
2. HEXANDRIA DIGYNIA—six stamina and two styles.
3. HEXANDRIA TRIGYNIA—six stamina and three styles.
4. HEXANDRIA TETRAGYNIA—six stamina and four styles.
5. HEXANDRIA POLYGYNIA—six stamina and many styles.

Seventh Class.

HEPTANDRIA, (of *seven* and *a man*) consisting of plants with hermaphrodite flowers, having seven stamina, and furnishes four orders.

The orders are,

1. HEPTANDRIA MONOGYNIA—seven stamina and one style.
2. HEPTANDRIA DIGYNIA—seven stamina and two styles.
3. HEPTANDRIA TETRAGYNIA—seven stamina and four styles.
4. HEPTANDRIA HEPTAGYNIA—seven stamina and seven styles.

Eighth Class.

OCTANDRIA, (of *eight* and *a man*) *eight male organs*, plants with hermaphrodite flowers, having eight stamina, or male organs, and comprehends four orders.

The orders are,

1. OCTANDRIA MONOGYNIA—eight stamina and one style.
2. OCTANDRIA DIGYNIA—eight stamina and two styles.
3. OCTANDRIA TRIGYNIA—eight stamina and three styles.
4. OCTANDRIA TETRAGYNIA—eight stamina and four styles.

Ninth Class.

ENNEANDRIA, (of *nine* and *a man*) comprehends plants with hermaphrodite flowers, having nine stamina, and consists of three orders.

The orders are,

1. ENNEANDRIA MONOGYNIA—nine stamina and one style.
2. ENNEANDRIA TRIGYNIA—nine stamina and three styles.
3. ENNEANDRIA HEXAGYNIA—nine stamina and six styles.

Tenth Class.

DECANDRIA, (of *ten* and *a man*) *ten male organs*, plants with hermaphrodite flowers, having ten stamina, or male organs, and it consists of five orders.

The orders are,

1. DECANDRIA MONOGYNIA—ten stamina and one style.
2. DECANDRIA DIGYNIA—ten stamina and two styles.
3. DECANDRIA TRIGYNIA—ten stamina and three styles.
4. DECANDRIA PENTAGYNIA—ten stamina and five styles.
5. DECANDRIA DECAGYNIA—ten stamina and ten styles.

Eleventh Class.

DODECANDRIA, (of *twelve* and *a man*) *twelve male organs*, comprises plants with hermaphrodite flowers, having twelve or more stamina, or male organs, to nineteen inclusive, and consists of six orders.

The orders are,

1. DODECANDRIA MONOGYNIA—twelve or more stamina and one style.
2. DODECANDRIA DIGYNIA—twelve or more stamina and two styles.
3. DODECANDRIA TRIGYNIA—twelve or more stamina and three styles.
4. DODECANDRIA PENTAGYNIA—twelve or more stamina and five styles.
5. DODECANDRIA OCTAGYNIA—twelve or more stamina and eight styles.
6. DODECANDRIA DODECAGYNIA—twelve or more stamina and twelve styles.

Twelfth Class.

ICOSANDRIA, (of *twenty* and *a man*, or *husband*) *twenty male organs*, consists of plants with

with hermaphrodite flowers, having about twenty or more stamina, or male organs, that are inserted either into the inner side of the calyx or corolla; by this last-mentioned circumstance is the Class in question distinguished from that immediately following, *Polyandria*, which have also frequently about twenty stamina, but they are inserted into the receptacle. This Class, *Icosandria*, is also distinguishable by having a monophyllous, hollow, or concave calyx, and to the inner side of which the petals are fastened by their claws; and there are five orders.

The orders are,

1. ICOSANDRIA MONOGYNIA—twenty or more stamina and one style.
2. ICOSANDRIA DIGYNIA—twenty or more stamina and two styles.
3. ICOSANDRIA TRIGYNIA—twenty or more stamina and three styles.
4. ICOSANDRIA PENTAGYNIA—twenty or more stamina and five styles.
5. ICOSANDRIA POLYGYNIA—twenty or more stamina and many styles.

Thirteenth Class.

POLYANDRIA, (of *many and a man*, or *husband*) many male organs, plants with hermaphrodite flowers, having many stamina, or male organs, which in this Class are inserted into the receptacle, and which distinguishes it from that immediately preceding, *Icosandria*, where the stamina are also numerous, but are attached to the inner part of the calyx, &c. therefore all plants having more than twelve stamina inserted in the *receptaculum* are of this Class, *Polyandria*, which consists of seven orders.

The orders are,

1. POLYANDRIA MONOGYNIA—many stamina and one style.
2. POLYANDRIA DIGYNIA—many stamina and two styles.
3. POLYANDRIA TRIGYNIA—many stamina and three styles.
4. POLYANDRIA TETRAGYNIA—many stamina and four styles.
5. POLYANDRIA PENTAGYNIA—many stamina and five styles.
6. POLYANDRIA HEXAGYNIA—many stamina and six styles.
7. POLYANDRIA POLYGYNIA—many stamina and numerous styles.

Fourteenth Class.

DIDYNAMIA, (of *twice and power*) two powers, comprehends plants with hermaphrodite flowers, having two long and two short stamina; in this circumstance of the stamina, long and short, two being longer, of superior power to the other two, consists the main

difference between the Class in question, and that of the fourth, which have also four stamina, but which are of equal length; therefore all plants having four stamina that are of unequal length, two of them long, and two short, are didynamious, i. e. of the Class *Didynamia*, of which there are but two families or orders, and are founded upon the absence and presence of the *pericarpium*, or seed-vessel.

The orders are,

1. DIDYNAMIA GYMNOSPERMIA—two long and two short stamina, and naked seeds (*gymnospermia*) lodged in the calyx.
2. DIDYNAMIA ANGIOSPERMIA—two long and two short stamina, and covered seeds (*angiospermia*) lodged in a proper pericarpium, or seed-vessel.

Fifteenth Class.

TETRADYNAMIA, (of *four and power*) four powers, plants with hermaphrodite flowers having four long and two short stamina, four being longer, of superior power to the other two, by which circumstance it may be distinguished from the sixth Class, which have six equal stamina; and consists of two orders, founded on the pericarpium; such as have a short round pod, (*siliculosa*) as honesty and Candy tuft, and such as have a long pod (*siliquosa*) as stock-gilliflower, &c.

The orders are,

1. TETRADYNAMIA SILICULOSA—four long and two short stamina, and short round pods.
2. TETRADYNAMIA SILIQUOSA—four long and two short stamina, and long seed-pods.

Sixteenth Class.

MONADELPHIA, (of *alone and a brotherhood*) one brotherhood, hermaphrodite flowers, having all the stamina united below into one body, forming a column, through which passes the style; and the orders are five, founded on the number of united stamina.

The orders are,

1. MONADELPHIA PENTANDRIA—five monadelphous stamina.
2. MONADELPHIA DECANDRIA—ten monadelphous stamina.
3. MONADELPHIA ENDECANDRIA—eleven monadelphous stamina.
4. MONADELPHIA DODECANDRIA—twelve or more monadelphous stamina.
5. MONADELPHIA POLYANDRIA—numerous monadelphous stamina.

Seventeenth Class.

DIADELPHIA, (of *twice and a brotherhood*) two brotherhoods in the same flower, hermaphrodite flowers, having two sets or columns

columns of united stamina, i. e. united below into two different bodies; the flowers are all papilionaceous, and have apparently ten stamina, but which are only two, one of which splits longitudinally from the middle upward, and terminates in about nine parts, appearing like so many distinct filaments; and the other stamen is simple or undivided, and lies closely along the fissure of the divided filament, which has generally as many antheræ as divisions, and the simple stamen has but one anthera; and from the number of antheræ in both filaments are founded the orders, which are four.

The orders are,

1. DIADELPHIA PENTANDRIA—diadelphous stamina, having five antheræ.
2. DIADELPHIA HEXANDRIA—diadelphous stamina with six antheræ.
3. DIADELPHIA OCTANDRIA—diadelphous stamina with eight antheræ.
4. DIADELPHIA DECANDRIA—diadelphous stamina with ten antheræ.

Eighteenth Class.

POLYADELPHIA, (of many brotherhoods) many brotherhoods, or unions of stamina, in the same flower, hermaphrodite flowers that have each many sets of united stamina, i. e. united by their filaments into several distinct bodies, and consists of three orders, derived from the number of stamina or antheræ appearing in each flower.

The orders are,

1. POLYADELPHIA PENTANDRIA—five polyadelphous stamina in each set.
2. POLYADELPHIA ICOSANDRIA—twenty polyadelphous stamina.
3. POLYADELPHIA POLYANDRIA—many polyadelphous stamina.

Nineteenth Class.

SYNGENESIA, (of together and generation) plants with compound flowers, having all the antheræ, or generative male organs, united into one cylindric body, and through which the style, or generative female organ, rises uniting in the same manner.

This Class contains the numerous tribe of compound flowers (see COMPOSITUS *Flos*); and the orders, or secondary divisions, arise from the different modes of intercommunication, or polygamia of the florets that compose each flower; such as, the florets all hermaphrodites—hermaphrodites and females—hermaphrodites and of no sex, or neuter—males and females—the florets in distinct cups within the main one—simple florets, so that this Class is divided into six orders.

The orders are,

1. SYNGENESIA POLYGAMIA ÆQUALIS

—equal polygamia, or the florets all hermaphrodites.

2. SYNGENESIA POLYGAMIA SUPERFLUA—superfluous polygamia, or the florets of the disk all hermaphrodites, and the circumference or radius all females, which latter are said to be superfluous or useless, because the impregnation of them is unnecessary, the fructification being completed in the hermaphrodites in the centre.

3. SYNGENESIA POLYGAMIA FRUSTRA-NEA—frustrated polygamia, i. e. the florets in the radius are neuter, or of no sex, being devoid both of stamina and style, so are ineffectual to the fructification, as in the case of sunflower, &c. in which the fructification is perfected only in the hermaphrodites, in the disk.

4. SYNGENESIA POLYGAMIA NECESSARIA—necessary polygamia, or being male and female florets, and no hermaphrodites, the presence of the male and females is necessary for perfecting the fructification.

5. SYNGENESIA POLYGAMIA SEGREGATA—separated polygamia, the florets of each compound flower separated from each other by means of partial cups, containing one or more florets, and stand within the general calyx, as in globe-thistle and elephant's-foot.

6. SYNGENESIA POLYGAMIA MONOGAMIA—monogamous or simple florets, the flower having only one floret in each general calyx, as in balsamine, *impatiens*.

Twentieth Class.

GYNANDRIA, (of a woman and a man) plants having the stamina or male organs placed either upon the style, or female organ, or the common receptacle elongated in the form of a style, supporting both the pistillum and stamina; and is divided into nine orders, founded each on the number of stamina in each flower.

The orders are,

1. GYNANDRIA DIANDRIA—two gynandrous stamina in each flower.
2. GYNANDRIA TRIANDRIA—three gynandrous stamina in each flower.
3. GYNANDRIA TETRANDRIA—four gynandrous stamina in each flower.
4. GYNANDRIA PENTANDRIA—five gynandrous stamina in each flower.
5. GYNANDRIA HEXANDRIA—six gynandrous stamina in each flower.
6. GYNANDRIA OCTANDRIA—eight gynandrous stamina in each flower.
7. GYNANDRIA DECANDRIA—ten gynandrous stamina in each flower.
8. GYNANDRIA DODECANDRIA—twelve gynandrous stamina in each flower.
9. GYNANDRIA

9. GYNANDRIA POLYANDRIA—many gynandrous stamina in each flower.

Twenty-first Class.

MONŒCIA, (of *alone* and *a house*) plants with male and female flowers apart, or alone, or distinct, in separate cups, in the same habitation; that is, within different cups on the same plant as in the cucumber, &c. and is divided into eleven orders, arising from the number, union, and situation of the stamina of the male flowers.

All monœcious plants are also termed androgynous, from the same circumstances of male and female flowers on different parts of the same plant. See ANDROGYNIA.

The orders are,

1. MONŒCIA MONANDRIA—monœcious plants with one stamen.
2. MONŒCIA DIANDRIA—monœcious plants with two stamina.
3. MONŒCIA TRIANDRIA—monœcious plants with three stamina.
4. MONŒCIA TETRANDRIA—monœcious plants with four stamina.
5. MONŒCIA PENTANDRIA—monœcious plants with five stamina.
6. MONŒCIA HEXANDRIA—monœcious plants with six stamina.
7. MONŒCIA HEPTANDRIA—monœcious plants with seven stamina.
8. MONŒCIA POLYANDRIA—monœcious plants with numerous stamina.
9. MONŒCIA MONADELPHIA—monœcious plants with monadelphous or united stamina, i. e. all the stamina united below into one cylindric body.
10. MONŒCIA SYNGENESIA—monœcious plants with syngenesious antheræ; that is, with all the antheræ, or tops of the stamina, united into a cylinder, as in the cucumber, gourd, bryony, &c. See Class SYNGENESIA.
11. MONŒCIA GYNANDRIA—monœcious plants with gynandrous stamina, i. e. the filaments situated upon a kind of pistillum, or style. See the Class GYNANDRIA.

Twenty-second Class.

DICŒCIA, (of *twice* and *an habitation*) two habitations, male and female flowers on two separate plants; that is, all the plants of this Class are either male or female, not hermaphrodite, as in the greater number of Classes; nor with male and female on the same plant, as in the immediately preceding Class, *Monœcia*, but male and female flowers on distinct plants, as in the genus *cliffortia*, *coriaria*, *carica*, moonseed, spinach, hop, hemp, and many others; and the female plants only produce seeds, which, however, require the vicinity of a male plant, or the asperion of the male dust to

impregnate the female flowers, or at least to render the seeds fertile; and from the seeds of the females, both male and female plants are produced.

This Class is divided into fifteen orders, and are founded upon the number, union, and situation of the stamina of the male plants.

The orders are,

1. DICŒCIA MONANDRIA—dicœcious male plants with one stamen.
2. DICŒCIA DIANDRIA—dicœcious male plants with two stamina.
3. DICŒCIA TRIANDRIA—dicœcious male plants with three stamina.
4. DICŒCIA TETRANDRIA—dicœcious male plants with four stamina.
5. DICŒCIA PENTANDRIA—dicœcious male plants with five stamina.
6. DICŒCIA HEXANDRIA—dicœcious male plants with six stamina.
7. DICŒCIA OCTANDRIA—dicœcious male plants with eight stamina.
8. DICŒCIA ENNEANDRIA—dicœcious male plants with nine stamina.
9. DICŒCIA DECANDRIA—dicœcious male plants with ten stamina.
10. DICŒCIA DODECANDRIA—dicœcious male plants with twelve stamina.
11. DICŒCIA ICOSANDRIA—dicœcious male plants with twenty or more stamina.
12. DICŒCIA POLYANDRIA—dicœcious male plants with numerous stamina.
13. DICŒCIA MONADELPHIA—dicœcious male plants with monadelphous or united stamina, being united by their filaments into a pillar or column, as in shrubby horse-tail.
14. DICŒCIA SYNGENESIA—dicœcious male plants with syngenesious antheræ, i. e. with the antheræ or tops of the filaments united.
15. DICŒCIA GYNANDRIA—dicœcious male plants with gynandrous stamina, or that are situated on a kind of pistillum, or style. See the Class GYNANDRIA.

Twenty-third Class.

POLYGAMIA, (of *many* and *marriage*) plants of a variety of sexes, that is, hermaphrodite flowers, and likewise male or female flowers, or both, on the same plant, or on distinct plants of the same genus; and from the different circumstances of polygamia this Class is divided into three orders.

The orders are,

1. POLYGAMIA MONŒCIA—the polygamia all on the same plant.
2. POLYGAMIA DICŒCIA—the polygamia on two distinct plants.
3. POLYGAMIA TRICŒCIA—the polygamia on three distinct plants.

Twenty-fourth Class.

CRYPTOGAMIA, (of *to hide* or *conceal*)

and a marriage) a clandestine marriage,—plants that have their fructifications either entirely concealed, or, from their minuteness or situation, imperfectly visible: such are the ferns, mosses, flags, sea-weed or wrack, and mushrooms, and of which the classic character is very imperfect, and the genera of course without any essential mark of distinction, so great is the obscurity that still prevails in this considerable part of the vegetable kingdom.

This Class of imperfect plants is divided into four orders or families, very different in their general habit.

The orders are,

1. CRYPTOGRAMIA FILICES—the *Filices* or Ferns.

This is a large tribe of plants, defined to be plants which bear their flower and fruit on the back of their leaves; but the flower and other parts of fructification are so minute, or imperfectly visible, that they do not admit of any regular classic distinction. See FILICES.

2. CRYPTOGRAMIA MUSCI—*Musci* or Mosses.

This is also a large tribe of plants with imperfectly distinguishable fructifications: their chief characteristic distinction is—antheræ without filaments—male flowers, constituted by the presence of the antheræ—the antheræ have, or are destitute of, a *calyptra*—seeds entirely naked, being devoid of the cotyledon or cover, so exhibit the naked embryo. See MUSCI.

3. CRYPTOGRAMIA ALGÆ—*Algæ*, Flags or Sea-weed.

A numerous tribe of imperfect plants, whose root, stem, and leaf are all one, and their fructification imperfectly known.

4. CRYPTOGRAMIA FUNGI—*Fungi*, or Mushrooms.

A very extensive tribe of plants, whose fructification is still entirely unknown. See FUNGI.

By the foregoing arrangement of the twenty-four Classes of the vegetable kingdom, and their respective orders, the student in gardening and botany will easily explain to himself the proper Class and order of all the different genera; especially, as to each genus we have all along subjoined the name of the Class and order to which it belongs; observing, that all the different species and varieties of each genus are also all of the same Class and order.

CLAY, a strong, cold, heavy, moist earth, cohering in a compact mass. See EARTH.

CLEMATIS, Climber, or Virgin's-Bower, and Traveller's-Joy, &c.

This genus furnishes several shrubby climbers of the flowery tribe, and two herbaceous,

upright, flowery perennials, all of hardy growth; adorned, some with winged, others with divided, and some with simple leaves, and all of them with quadripetalous flowers.

Class and order, *Polyandria Polygynia*.

Characters.] CALYX, none. COROLLA, four oblong, loose petals. STAMINA, numerous awl-shaped filaments, with the antheræ growing to their sides. PISTILLUM, numerous roundish, compressed germina, subulated styles, and simple stigmas. PERICARPIUM, none. SEMINA, numerous roundish seeds, collected into a head, with the styles adhering thereto.

The species are as follow:

The first eight species are shrubby climbers, having slender stalks and branches, climbing or mounting themselves on support by *cirrhi*, or claspers, many feet high.

1. CLEMATIS *Viticella*.

Virgin's-Bower Clematis.] Clematis with shrubby, climbing stalks, branching at every joint, and mounting upon support fifteen or twenty feet high; compound and decom-pound leaves of many oval, entire lobes, and numerous slender foot-stalks by threes, each supporting one flower, of different colours in different varieties.

Varieties are,] Virgin's-Bower with single blue flowers—single red flowers—single purple flowers—double purple flowers; all of them appearing in July and August.

This species and varieties obtain the name Virgin's-Bower, from their peculiar excellence in forming arbours or bowers, &c. they being admirable climbers, and often shoot ten or fifteen feet in one year, spreading their branches numerously every way, and very closely covered from bottom to top with leaves and flowers; but the double-flowered variety is the most beautiful, its petals being so numerous as to obliterate the fructification, and continues the longest in bloom. They are all well calculated for training over covered arbours, or rural seats, or against naked walls or other fences, and as climbers in shrubberies, &c.

2. CLEMATIS *Vitalba*.

Great White Climber, Traveller's-Joy, and Old Man's Beard.] Clematis with shrubby, tough, climbing stalks, very branchy and cirrhous, mounting upon support twenty feet high, garnished with winged climbing leaves of five or seven heart-shaped lobes, and numerous bunches of white flowers, succeeded by compact clusters of seeds, terminated by long, white, hairy plumes, hanging down like beards; hence sometimes called Old Man's Beard.

It grows wild in England in hedges, mounting by its numerous clasps over the bushes

and

and trees in its neighbourhood, spreading widely every way, that the hedges are often covered with its flowers in summer, and its white, bearded seeds in autumn and winter, appearing singular and ornamental, whereby, as growing abundantly by road sides, affording entertainment to passengers, is also called Traveller's-Joy; it is rarely admitted in gardens, though a few plants, properly disposed in large shrubbery-works, will have an agreeable effect as climbers.

3. CLEMATIS *Viorna*.

Coriaceous-flowered Climber.] Clematis with shrubby climbing stalks, branching and rising on support eight or ten feet high; compound and decomposed leaves of nine nearly heart-shaped, sometimes trifid lobes; and purplish-blue flowers, having thick coriaceous petals, appearing in July and August.

4. CLEMATIS *orientalis*.

Oriental Yellow Climber.] Clematis with shrubby, climbing stalks and branches, mounting upon support six or eight feet high; compound leaves of nine folioles, cut angularly into wedge-shaped lobes; and yellowish green flowers in April and May.

5. CLEMATIS *virginiana*.

Virginian Ternate-leaved White Climber.] Clematis with shrubby, climbing stalks and branches, rising on support many feet high; ternate or trifoliate leaves, of three heart-shaped leaflets, somewhat lobate and angular, and spreading, white flowers.

6. CLEMATIS *crispa*.

Curled-flowered Climber.] Clematis with shrubby, climbing stalks, branchy, and rising upon support four or five feet high; simple and trifoliate leaves, the folioles in some entire, others divided into three lobes; and purple flowers, having thick, curled petals, appearing in July and August.

7. CLEMATIS *cirrhoua*.

Cirrhoua Evergreen Climber.] Clematis with shrubby, climbing stalks, very branchy, bushy, and cirrhous, mounting upon support six or eight feet high; simple, evergreen leaves, sometimes bifid, and some cut into three lobes; and greenish flowers, appearing in winter.

8. CLEMATIS *Flammula*.

Sweet-scented Clematis.] Clematis with shrubby, climbing stalks, very branchy, bushy, and cirrhous, rising on support twenty feet high; the lower leaves are winged and deeply lacinated, the upper ones are single, entire, and spear-shaped; the flowers, which are white and sweet-scented, appear in great profusion in August.

The two following are herbaceous, and of upright growth.

9. CLEMATIS *erecta*.

Upright White Clematis.] Clematis with fibry perennial roots; upright annual stalks a yard high; winged opposite leaves of three or four pair of oval-spear-shaped, entire lobes, terminated by an odd one; and at top of the stalks, white flowers in large panicles, appearing in June.

Variety.] Low, upright, white Clematis with large flowers.

10. CLEMATIS *integrifolia*.

Entire-leaved Blue Clematis.] Clematis with fibry perennial roots; upright annual stalks a yard high; large, simple, spear-shaped, entire leaves, growing opposite; and from the upper part of the stalks, many long, naked peduncles, each supporting a large, drooping, blue flower, appearing in June.

The flowers of all the species, in their natural, single state, are composed each of four oblong petals, and in all the climbing kinds are remarkably numerous, arising from almost every part of the branches at the axillas of the leaves, succeeded, in several of the climbers, and both the upright herbaceous sorts, with abundance of seed in autumn, growing in clustered heads, all of which, being furnished with long white plumes, have a singular appearance in autumn and winter.

All the species, both climbers and upright kinds, are very hardy, and prosper in any common soil of a garden, and in any exposure.

The first eight sorts are of climbing growth, and have durable stalks, but which being long, slender, and weak, must have support either of a trellis, strong tall stakes, walls, paling, or hedges, &c. otherwise their branches will trail on the ground; so that they are proper to train over covered arbours, or against high naked walls, or the like; or may be introduced in large shrubbery or wood-works, here and there one, to run over the bushes; and some may also be planted singly in large clumps between deciduous shrubs, placing tall strong stakes for their support.

Of these climbing kinds, the first sort, Virgin's-Bower and varieties, have the greatest merit for ornament, and are the sorts that are principally known and cultivated in the British gardens.

The ninth and tenth sorts are proper furniture for any of the compartments of the pleasure-ground, and they will succeed any where: they are particularly well calculated to occupy vacant spaces in the shrubbery clumps, where they will show themselves to great advantage, in their abundant flowers in summer.

Propagation of all the Sorts.

All the shrubby climbing kinds are propagated by layers, and some of them also by cuttings.

By layers :—the young shoots of the same and last year are the proper parts for propagation ; and if layed in summer, before they become woody, they will more certainly succeed ; therefore, when the shoots of the year are two or three feet long, let the branches on which they grow be brought down and pegged in the ground ; then lay all the young shoots in the earth, in the usual way, with their tops three or four inches out, and by October most of them will be rooted ; when, or in spring following, they may be transplanted into the nursery.

This method of summer laying in the shoots of the Clematis is more particularly necessary for the Virgin's-Bower and varieties, and most of the foreign climbers.

The Traveller's-Joy and Evergreen Climber, however, may be layed at any time ; they will also grow by cuttings of the young shoots in spring or summer, though those of the latter rather require aid of a hot-bed ; and the Evergreen sort often send up suckers from the bottom, each of which, transplanted, becomes a good plant.

The two upright herbaceous sorts are easily propagated, by dividing their roots in autumn, or early in spring, which multiply exceedingly, and may be divided every two or three years ; every slip having a fibre at bottom, and bud at top, will readily grow.

These two sorts may also be raised from seeds, in a bed or border of common earth, sown in autumn, or early in spring ; and when the plants are a year old, they will produce flowers.

CLEOME,

Furnishes the stove with annual, herbaceous, Indian exotics, garnished with lobate leaves, and tetrapetalous flowers.

Class and order, *Tetradynamia Siliquosa*.

Characters.] CALYX, a small, four-leaved, spreading cup. COROLLA, four petals rising upwards ; the lower ones less than the others, with three nectar-bearing glandules, placed in the divisions of the cup. STAMINA, six declining, subulate filaments, with lateral anthers. PISTILLUM, an oblong, declining germen, simple style, and broad assurgent stigma. PERICARPIUM, a long, cylindric, one-celled pod, containing many roundish seeds.

This genus consists of several species ; the principal of which are,

1. *CLEOME heptaphylla*.

Seven-leaved Cleome.] With gynandrious flowers ; leaves nearly seven-lobed, and prickly stem.

2. *CLEOME pentaphylla*.

Five-leaved Cleome.] With gynandrious flowers ; leaves five-lobed, and unarmed stem.

3. *CLEOME triphylla*.

Three-leaved Cleome.] With gynandrious flowers ; leaves three lobed, and unarmed stem.

4. *CLEOME viscosa*.

Viscous Cleome.] With dodecandrious flowers, and leaves five and three-lobed.

These are all annual stove plants, and are propagated by seeds sown in a hot-bed in the spring, and when the plants have arisen two or three inches high, should be planted singly in pots and plunged into another hot-bed to forward them, and afterward removed to the stove, there to blow and ripen their seeds ; or may be placed, in their pots, in the full air in July and August, &c.

CLETHRA, Clethra.

There is one principal species, a deciduous flowering shrub for the shrubbery.

Class and order, *Decandria Monogynia*.

Characters.] CALYX, monophyllous, five-parted, and permanent. COROLLA, five oblong petals, broadest towards the extremities. STAMINA, ten filaments, and oblong erect antheræ. PISTILLUM, roundish germen, permanent style, and trifid stigma. PERICARPIUM, a roundish, trivalvular, trilocular capsule, lodged in the calyx, and many angular seeds.

The species is,

CLETHRA alnifolia.

Alder-leaved American Clethra.] Clethra with a shrubby stem, dividing into a branchy head, four or five to eight or ten feet high ; long, spear-shaped, serrated, alternate leaves ; and at the ends of the branches, long racemous spikes of white flowers in July and August.

This is a very ornamental shrub, but more particularly during its bloom, and merits a place in every curious collection, allowing it rather a moist than dry soil.

It is propagated by seeds, layers, and suckers.

By seeds :—these are procured from America, and sown in pots of light earth, to move to shade in summer, and shelter in winter, because the plants sometimes do not come up till the second spring.

By layers :—perform it on the young shoots in autumn ; water them the following summer, and by autumn after they will be rooted, though it is sometimes two years before that is accomplished.

Suckers from the root may be transplanted in autumn.

autumn or spring, being careful to take them up with root fibres.

CLIFFORTIA, *Cliffortia*.

It furnishes three evergreen African shrubs for the green-house, adorned with simple and trifoliate leaves, and apetalous flowers.

Class and order, *Diæcia Polyandria*.

Characters.] CALYX, male and female flowers on separate plants, having cups composed of three oval acute leaves; those of the females are permanent. COROLLA, no petals. STAMINA, numerous erect filaments in the males, and oblong, twin, compressed antheræ. PISTILLUM, in the females, an oblong germen under the calyx, two plumose styles, and simple stigmas. PERICARPIUM, an oblong, nearly columnar, bilocular capsule, crowned by the calyx, containing solitary seeds.

The species are,

1. CLIFFORTIA *ilicifolia*.

Ilex-leaved Cliffortia.] *Cliffortia* with a shrubby, slender stem, very branchy, and forming a diffused head four or five feet high; stiff leaves, heart-shaped at the base, broad and indented at the ends; and yellowish-green close-fitting flowers, growing singly.

2. CLIFFORTIA *ruscifolia*.

Ruscus-leaved Cliffortia.] *Cliffortia* with a shrubby, slender stalk, forming a branchy head three or four feet high; small, spear-shaped, stiff, entire leaves, in clusters; and between them loose bunches of yellowish green flowers.

3. CLIFFORTIA *trifoliata*.

Three-leaved Cliffortia.] *Cliffortia* with a shrubby, very slender stem, branching and forming a spreading head three or four feet high; trifoliate, close-fitting leaves, having the middle lobe tridentate, and yellowish-green flowers almost close to the branches.

The flowers of all the species are apetalous, so make no great appearance, but are the most conspicuous in the male plants, by their numerous, yellow, erect stamina.

All the three species, considered as evergreens, are very ornamental, and being natives of *Æthiopia*, require shelter here in winter; so must be kept in pots of rich light earth, and placed in the green-house collection, giving plenty of water in summer, and but very sparingly in winter.

Their propagation is generally effected by cuttings in this country, which must be young shoots of five or six inches length, planting them in pots in spring or summer, and plunge them in a hot-bed, they will readily take root.

They may also be propagated by layers in the spring.

CLIMBING PLANTS, plants whose stalks either ascend spirally round any adjacent support, or climb by means of clasps or tendrils. See CIRRHUS.

Of Climbers, there are both herbaceous and woody plants, which may be divided into three kinds, according to their mode of climbing; such as Twining Climbers, Cirrhus Climbers, Parasitic Climbers.

Twining Climbers; such as have winding stalks (*caulis volubilis*) and which twist or ascend themselves spirally about any neighbouring support, as scarlet kidney-beans, hops, convolvulus major, and some species of honeysuckle.

Cirrhus Climbers; such as ascend through means of clasps, tendrils, or spiral strings, issuing from the sides of the stalks and branches (*caulis cirrhosus*), or from the foot-stalks of the leaves, and even from the leaves themselves, so twist about any thing they encounter, whereby their stalks are supported and arrive at the height nature designed them: examples of this sort are, almost all the pea tribe, cucumber, vine, passion-flower, traveller's-joy, *Smilax*, or rough bindweed, and many other sorts.

Parasitic Climbers; these are also of the cirrhus tribe, but their cirrhi, or clasps, plant themselves like roots in the bark of the adjoining trees (*caulis parasiticus*), so the plant thereby supports itself like a parasite, on other plants, and mounts to their tops; such as the ivy, virginia creeper, radican bignonia, woody night-shade, and several others: these sort of Climbers also root in walls, pales, or any kind of buildings, and ascend to their tops, if ever so high, particularly the three former.

Many of the climbing and trailing tribe are very ornamental in gardens, both of the herbaceous and shrubby kinds; the following is a list of the principal sorts.

Of the herbaceous kinds are *convolvulus*, several species and varieties—everlasting pea—painted lady-pea—*cynanchum*, several species—scarlet kidney-bean, and white variety—nasturtium—gourd—hop-plant—*tamus*, or black bryony—Cretan black bryony—*bryonia*, or white bryony—*ipomœa coccinea*, or scarlet convolvulus, and some others.

All these herbaceous Climbers may be allowed places in large borders, placing sticks for their support, upon which most of them will naturally climb, and appear very ornamental in summer.

Some of the more aspiring sorts may also be placed to run over arbours, or any kind of rural seats in gardens.

Of shrubby kinds, or such as have perennial stalks,

stalks, are the following: radicant and evergreen *bignonia*—climbing *celastrus*—*clematis*, virgin's-bower, several species and varieties—*glycine*, or kidney-bean-tree of Carolina—ivy—Virginia creeper—honeysuckle, many sorts—*monispermum*, or moon-seed, two or three species—*passiflora*, or passion-flower—*periploca*, or Virgin silk—*rubus*, or bramble, several sorts—*smilax*, or rough bindweed—woody night-shade, two or three varieties—*vinca*, or periwinkle, many varieties—*vitis*, the vine.

All these shrubby Climbers, considered as plants of ornament, are proper furniture for shrubberies of any considerable extent, and may be employed different ways; some may be dispersed about the clumps, detached from the other plants, so placing strong, tall stakes for their support, and they will have a singular effect among the other shrubs; others may be placed in large borders and the boundaries of lawns, &c. and some stationed near hardy trees and large shrubs, and suffered to climb about their stems, or interweave in their branches, and aspire to their tops or extremities, and spread about in their natural way, when they will have a beautiful effect in forming rural variety; some may also be employed to ornament naked or unsightly walls of high buildings, and some for decorating or forming rural arbours, where there is lattice, or any kind of open-work, for the branches to climb upon, which, in many of the sorts, will shoot ten or fifteen feet in a summer; so that an arbour may be formed in one season.

But for particulars of the different sorts, and their culture, see their respective genera.

CLITORIA.

A genus of exotic climbing plants, garnished with winged leaves and papilionaceous flowers.

Class and order, *Diadelphia Decandria*.

Characters.] CALYX is monophyllous, erect, tubulated and persistent. COROLLA is papilionaceous, having a large, spreading, emarginated vexillum, small, obtuse, oblong wings, and shorter, tickle-shaped keel. STAMINA, ten diadelphous filaments and single antheræ. PISTILLUM, an oblong germen, rising style, and obtuse stigma. PERICARPIUM, a very long, linear, compressed pod, ending in a point, opening with two valves, containing a number of kidney-shaped seeds.

The principal species are,

1. CLITORIA ternatea.

Ternatean Winged-leaved Clitoria.] Hath a twining, herbaceous stalk, rising four or five feet high, garnished with winged leaves composed of two or three pair of oval lobes, ter-

minated with an odd one, and placed alternate; from the axillas of the leaves, the flowers come out on foot-stalks, very large, of a fine blue colour, and are succeeded by long, linear pods.

2. CLITORIA virginiana.

Virginia small-flowered Clitoria.] Hath slender twining stalks, garnished with ternate, oblong-pointed leaves, and small purple flowers on short foot-stalks, having double, bell-shaped cups.

3. CLITORIA brasiliensis.

Brazilian Clitoria.] Hath a twining stalk rising five or six feet high, garnished with ternate leaves, and large purple flowers on long foot-stalks, having each a single bell-shaped cup.

The first species is perennial-rooted in India, the others are annual; they are all stove plants, and are propagated by seeds sown on a hot-bed, and afterwards transplanted in pots and plunged in the bark-bed, shaded and watered till taken root, when they must be supported by sticks placed for them to twine upon, and exhibit their beautiful flowers.

CLUSIA, Balsam-tree.

A genus of West-India exotics for the stove.

Class and order, *Polygamia Monœcia*.

Characters.] CALYX, an imbricated cup of four or six concave, persistent leaves. COROLLA, four or six large, roundish, concave, spreading petals. STAMINA, many filaments, shorter than the corolla, topped with simple antheræ. PISTILLUM, an oblong, ovate germen, style none, but crowned with a flat, stellated stigma. PERICARPIUM, an oval, six-furrowed capsule, opening with six valves, containing many oval seeds in a pulp.

The species are,

1. CLUSIA flava.

Yellow-flowered Clusia.] Clusia with a tree-like stem, rising several feet high, shooting out many branches which are garnished with thick, round, succulent leaves placed opposite; and flowers produced at the ends of the branches, succeeded by oval, furrowed fruit.

Varieties.] Clusia with white flowers and scarlet fruit—Clusia with pink-coloured flowers and greenish fruit—Clusia with yellow fruit.

2. CLUSIA venosa.

Veined-leaved Clusia.] Rises to twenty feet, with branches covered with woolly down, garnished with large, oval, serrated, spear-shaped leaves full of veins, and their under sides of a shining brown-colour; the flowers are pink-coloured, and come out at the ends of the branches in loose spikes.

Both these species are very tender, and must therefore

therefore be kept constantly in the bark-bed in the stove, and sparingly watered; they are propagated by cuttings, and treated in the same manner as other stove plants of the like nature.

CLUYTIA, Cluytia.

This genus furnishes three shrubby, succulent, evergreen exotics for the green-house and stove, garnished with simple leaves, and greenish-white, quinquepetalous flowers.

Class and order, *Diæcia Gynandria*.

Characters.] CALYX, male and female flowers on separate plants, having cups composed of five large, oval, concave leaves. COROLLA, five heart-shaped, spreading, permanent petals, and at the bottom five nectariums placed circularly; and in the males five small ones within the others. STAMINA, five horizontal filaments, situated in the middle of a style, and roundish versatile antheræ. PISTILLUM, in the males no germen, but a long staminiferous style; in the females a roundish germen, and three bifid styles, and obtuse stigmas. PERICARPIUM, a globular, six-furrowed, trilocular capsule, and three seeds.

The two first species are green-house exotics.

1. CLUYTIA *alaternoides*.

Alaternoid Æthiopian Cluytia.] Cluytia with a shrubby stem, branching laterally and erect, forming a head six or eight feet high; very narrow, spear-shaped, close-fitting, greyish, alternate leaves; and from their axillas, solitary, small, greenish-white, erect flowers.

2. CLUYTIA *pulchella*.

Broad-leaved Æthiopian Cluytia.] Cluytia with a shrubby stem, branching from the sides erectly six or eight feet high; oval, entire, sea-green, alternate leaves, on foot-stalks; and small greenish-white flowers along the sides of the branches.

The following is a stove exotic.

3. CLUYTIA *Eluteria*.

(Eluteria)—or Maritime Indian Cluytia.] Cluytia with a shrubby stem, branching erectly five or six feet high; heart-shaped-lanceolate, pointed, foot-stalked, alternate leaves; and flowers in spikes at the ends of the branches.

The flowers of these three species are formed each of five small petals, appearing in June, July, and August, but are not very ornamental; so that the merit of the shrubs is in their beautiful evergreen leaves.

The two first sorts are green-house plants, and the other is of the stove, so must always be kept in pots of light rich earth; though they will all succeed in the open air in sum-

mer; and being always green, they are very ornamental at all seasons.

Their propagation is by cuttings in spring or summer, planting them in pots of light earth, and plunge them in a hot-bed, they will readily emit roots, and must be transplanted into separate pots.

CNEORUM, Widow-Wail.

There is but one species, a low evergreen shrub for the shrubbery, adorned with simple leaves, and tripetalous flowers.

Class and order, *Triandria Monogynia*.

Characters.] CALYX is monophyllous, tridentate, and permanent. COROLLA, three oblong, spear-shaped, erect petals. STAMINA, three short filaments, and small antheræ. PISTILLUM, a blunt, trigonous germen, firm style, and trifid stigma. PERICARPIUM, a globular, trilobate, trilocular, dry berry, and three seeds.

The species is,

CNEORUM *triccoccum*.

Triccoccus, or Three-fruited Cneorum.] Cneorum with a shrubby hard stem, divided low into a branchy, bushy head two or three feet high, closely garnished with oblong-oval, close-fitting, stiff leaves, two inches long, and half an inch broad; and from their axillas, towards the ends of the branches, yellowish flowers, growing singly, succeeded by triccoccus, three-seeded, baccaceous fruit.

It flowers from May till October, and affords plenty of ripe seed.

This is a very ornamental little evergreen for the fronts of the shrubbery clumps, though it is sometimes retained as a green-house plant; but this is needless, unless merely for the sake of variety, for it will prosper freely in the full air the year round, observing to allow it a dry soil, in which it will endure the rigours of severe winters, better than in rich moist ground.

The propagation of this shrub is by seeds and cuttings.

By seeds:—sow them in a bed of common earth half an inch deep in October, and most of the plants will rise in the spring following, the largest of which, in the spring after, may be thinned out, and planted in the nursery-way, and in two or three years they will be ready for the shrubbery. &c.

By cuttings:—this may be done in spring: cutting or slipping off some of the former year's shoots five or six inches long, plant them in a pot of good earth, and plunge them in a hot-bed, they will soon root and set to growing: young shoots planted in a shady border in July, or early in August, will also grow.

COCCOLOBA, Sea-side Grape.

A genus of evergreen tree and shrub exotics, natives of the sea-shores in the West-Indies, some of which are retained here in our stove collections; grow six or seven to many feet high, garnished with heart-shaped, roundish and oblong leaves; apetalous flowers, and bunches of berries, like grapes.

Class and order, *Ocandria Trigynia*.

Characters.] CALYX, monophyllous, five-parted, concave, spreading, permanent. COROLLA, no petals. STAMINA, eight subulate spreading filaments, and roundish, twin antheræ. PISTILLUM, an ovate, trigonal germen, three short, slender, spreading styles, and simple stigma. PERICARPIUM, none; the cup becomes succulent and berried, involving an ovate, unilocular nut.

The species of most note are,

1. COCCOLOBA *Uvifera*.

(*Uvifera*)—*Grape-bearing, round-leaved Coccoloba.*] Coccoloba with a tree stem, branching irregularly; large, roundish, heart-shaped, thick leaves, six or seven inches broad; and large bunches of purple berries—Native of the West-India islands.

2. COCCOLOBA *pubescens*.

Pubescent Great-leaved Coccoloba.] Coccoloba with a tree stem of lofty branching growth; larger, orbiculate, pubescent-hairy leaves eight or ten inches to one foot diameter, or more, and quite entire—Native of New Spain.

3. COCCOLOBA *excoriata*.

Excoriated branched Coccoloba.] Coccoloba with a large branchy stem, growing many feet high, the branches appearing as if excoriated or barked; and large, ovate, light-green, shining leaves—Native of Campeachy.

4. COCCOLOBA *tenuifolia*.

Small-leaved Coccoloba.] Coccoloba with a shrubby, branchy stem, and smaller, ovate, membranaceous, light-green leaves, five or six inches long and three broad—Native of Jamaica.

5. COCCOLOBA *punctata*.

Punctated. Spear-leaved Coccoloba.] Coccoloba with a shrubby stem, branching twelve or fifteen feet high; and spear-shaped, ovate leaves, six inches long, veined, and shining.

The above five species of Coccoloba, although some of them, in their native climates, are of a lofty stature, in this country in our hot-houses, mostly assume a moderate or shrub-like growth, six or seven feet high; are very ornamental in their large evergreen leaves; but rarely flower, and never produce fruit here.

They must in this country be always re-

tained in the stove or hot-house, planted in pots of lightish good earth; and managed as other woody exotics of similar nature, residents of the stove.

The propagation of all the sorts is principally by seed obtained from the West-Indies, &c. and sown in pots of light rich earth, plunged in a bark-bed or other hot-bed; and when the plants are come up a few inches in growth, prick them singly in small pots, watered and placed in the bark-bed; shading them from the sun till they have taken fresh root; and continue them always in the hot-house.

COCHLEARIA, Spoonwort, or Scurvy-Grass and Horse-Radish.

The plants are herbaceous and hardy, and of which there are two species that merit culture; one of them a fibrous-rooted biennial for medicine; the other a carrot-rooted perennial valuable for its root as an esculent, well known by the appellation of Horse-Radish.

Class and order, *Tetradynamia Siliculosa*.

Characters.] CALYX, four oval, concave leaves. COROLLA, four oval, spreading, cruciform petals. STAMINA, four long, and two short filaments, and obtuse, compressed antheræ. PISTILLUM, a heart-shaped germen, short style, and obtuse stigma. PERICARPIUM, a heart-shaped, gibbous, compressed, bilocular pod, affixed to the style, and eight seeds.

The species of our gardens are,

1. COCHLEARIA *Officinalis*.

Common Officinal Scurvy-Grass.] Cochlearia with a fibrous root, crowned by a cluster of round succulent leaves, hollowed like a spoon, and amongst them branchy stalks ten or twelve inches high, garnished with oblong, sinuated leaves, and at the ends of the branches clusters of small white flowers.

It flowers in April and May, succeeded by plenty of seeds in June.

2. COCHLEARIA *Armoracia*.

Horse-Radish.] Cochlearia with a long, thick, perpendicular, white root, crowned by large, spear-shaped, erect leaves; and between them an upright stalk, garnished with small jagged leaves, and terminated by white flowers.

The first sort, *Cochlearia Officinalis*, is a medical herb, and its virtue resides in the leaves and stalks. It may be considered both as an annual and biennial; and its propagation is by seed annually in spring or autumn, in any situation, sowing it on the surface, and rake it in, which, if sown in autumn soon after it ripens, i. e. in July, or beginning of August, the plants will rise soon after; thin-

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ing them to three or four inches, and they will stand the winter, and be fit for use in spring.

The second species, *Horfe-radish*, is in much esteem for its eatable root, which is used raw, scraped into fine shreds, and is either used alone as sauce to flesh meat, or incorporated in fallads, and is also used for garnish to dishes, &c.

It is a very hardy plant, is perennial in root, and its nature of growth is—The bottom of the root generally resolves itself into a thick, knotty, durable stool, at a certain depth in the ground, and from which arise several erect root-shoots, advancing perpendicularly to the surface of the earth, which, after having one or two years' growth, acquire a substance of one or two inches thickness, or more, and that, being taken up for use, the stool remaining sends up a fresh supply the year following; therefore, in the culture of this plant, it is necessary to plant the roots twelve or fifteen inches deep in the ground, to form stools that depth under the surface, that they may send up long, straight, regular root-shoots, which, arising in spring, continue increasing in substance till September or October, when, in rich ground, they probably will be large enough for use, i. e. about an inch thick; but if they are much smaller, permit them to have another summer's growth, observing, when you take them up, to trench the ground open to the depth of the stool; so cutting off the young shoots with the spade or a knife, even and close to the place from whence they proceed, always leaving the old stools undisturbed, and they will furnish you with a fresh crop, as above, annually.

The propagation of this plant is by roots, cuttings of which, taken from the top an inch or two long, or even any part of the root cut into sets that length, each having an eye or bud, will readily grow and become a plant.

But although any part of the root will thus readily grow, the best sets for planting are cuttings taken from the top of the roots with the head or crown to them, either of the principal roots, or of their off-sets or side-shoots, as also of the small off-sets arising immediately from the stools; therefore, when intended to make a fresh plantation, it is proper, according as the roots are taken up occasionally for use, to reserve a quantity of the largest off-sets, and lay them in the earth till wanted; then cut the tops off for planting two or three inches long; the tops of the main roots may also, when taken up, be cut off an inch or two long, and preserved as above for the same purpose; but this latter is only practicable in private gardens; for, if the market-gar-

deners were to cut off the tops of their marketable roots, it would render them unsaleable; so, in this case, recourse is commonly had to the off-sets above described.

The season for planting them is any time in open weather from November till spring, though I should rather prefer the month of February or beginning of March, especially in wet or stubborn ground.

As to the soil proper for their culture, observe, that although the plants will grow in almost any soil and situation, yet to have long straight roots of considerable substance, a rich, moderately-light, deep soil, in an open exposure, should, where possible, be chosen, and which should be regularly trenched two moderate spades deep, well breaking all large clods, that nothing may obstruct the perpendicular growth of the roots.

The method of planting is—The sets or cuttings are to be planted in rows two feet asunder, nine inches distance in the lines, and each cutting placed twelve or fifteen inches deep, for the reason already hinted, and may either be planted by dibber, after the ground is dug, or they may be trenched in, placing them in the bottom of the trenches as you proceed in trenching.

But, first, of planting by dibber:—The ground being dug a proper depth, as before directed, and the surface laid level, then begin at one end, and strain a line cross-ways the ground, and having a long dibber, make holes therewith twelve or fifteen inches deep, and nine asunder, and as you go on, drop one set or cutting in each hole, with the top or crown upright, striking in the earth upon them; one row being thus planted, move the line two feet farther, and plant another in the same manner, and so proceed to the end.

Next, with regard to the method of planting by trenching them in:—The ground for this method, should be light and loose, and trenched in the usual way, beginning therefore at one end of the piece, open a trench two spades wide, and one spade deep, and dig the bottom; then, by line, set a row of cuttings along the middle of the bottom nine inches distance, inserting them to their tops in the earth, and then dig the next trench the same width and depth, turning the earth thereof into the first upon the row of plants, breaking all large clods, and level the top; then digging the bottom of this second trench, plant another row of cuttings as above, covering them with the earth of a third trench; and in this manner proceed till the whole is planted, levelling the surface as you go on in a regular manner.

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When the whole is planted in either of the above methods, the ground, this first year, may be sown with spinach and radishes, or any flight-rooting temporary crop, that comes off early in summer, by the time the Horfe-Radish appears, which, as they have to shoot quite from the bottom, they rarely make their appearance the first year before the middle of May, when all other crops must be cleared off, and the ground hoed to destroy weeds; and the leaves of the Horfe-Radish will soon cover the ground, and no further care will be required till the roots are fit to take up for use.

In October following you may examine the roots; sometimes they will make such progress as to be large enough for use; but if they, however, are not greatly wanted, they will be in excellent order by that time twelve-month.

When the roots are to be taken up for use, begin at the first row, and open a trench two spades wide, close along by the first row of plants, and as deep as the stool or bottom of the roots, but without disturbing them; then with your knife or sharp spade cut off all the shoots, large and small, of each stool, close and level to the place from which they arise, leaving the mother stools in the ground; and when you have taken up all the plants of the first trench, then proceed to the next row; open another trench, turning the earth into the first, and cut off all the shoots of this row as before; and in like manner continue taking up the whole, according as they are wanted; and the stools remaining undisturbed, they will send up a fresh supply of shoots for another year's service, and after these another; and in that manner they will furnish a succession for many years, observing to take up the productions of each year as above directed.

But I would observe, that, after the first and second year, the stools spread at bottom, and send up many small shoots between and in the rows; therefore, to encourage the principal shoots, all the intervening small spawn should be annually drawn up in May and June.

It is likewise proper to remark, that although the stools of these roots will endure many years, they will in time become weak, or worn out, as also the soil; therefore, in six or seven years, more or less, when you perceive the shoots come weak and inconsiderable, prepare to make a fresh plantation in another part of the garden.

COCOS, Cocoa-Nut-Tree.

Curious lofty trees of the palm tribe, from the West Indies, and cultivated here in hot-

houses for variety and singularity of growth, they growing with a single erect stem, without branches, having very large, long, branch-like, winged leaves, of several feet in length.

Clas and order, *Monœcia Hexandria*.

Characters.] CALYX, male and female flowers apart on the same plant, growing in a spadix, protruded from a general univalvular spatha, each flower of the spadix having a cup composed of three small, concave, coloured leaves. COROLLA, each flower of the spadix composed of three petals. STAMINA, six filaments, and arrow-shaped antheræ. PISTILLUM, an oval germen, no style, but a trilobed stigma. PERICARPIMUM, a very large, roundish, trigonous, leathery cover or drupe, inclosing a large, oval, hard nut, having three holes at the base.

The species are,

1. *Cocos nucifera*.

Nut-bearing Cocos, or Cocoa-nut-tree.] Cocos with an upright, simple, branchless trunk, many feet high, garnished at top with large, branch-like, winged leaves, of many sword-shaped lobes, folded back at the edges; and at top of the stem, long spadiceous bunches of flowers, succeeded by clusters of very large, triangular, fibrous fruit, each containing a large oval nut, inclosing a white sweet kernel, and a quantity of wholesome milky liquor.

This tree is a native of India, where it obtains sixty feet stature; and its branch-like leaves are often twelve or fifteen feet long, appearing like branches, there being no other.

2. *Cocos aculeata*.

Prickly Cocos, or Great Macaw-tree.] Cocos with an upright, branchless stem, growing thirty feet high, covered with a brownish bark, armed with numerous black prickles, garnished with large frondose-winged leaves six feet long, composed of sword-shaped folioles, having the ribs prickly, and long spadiceous bunches of flowers, succeeded by egg-shaped, coriaceous, dark-purple fruit, including an oval-oblong, pointed nut, containing an oblong kernel and milky liquor.

These two species of Cocos are tender exotics, are cultivated in curious hot-house collections of similar tender plants for curiosity, and the singular variety of their large frondose leaves.

Both the species are raised from the nuts, great quantities of which, particularly the first, are annually brought to England by the West-India ships; these, as soon as they arrive, are to be planted separately in pots of rich

rich earth, placing them side-ways, and directly plunge the pots over their rims in a bark-bed, and in six weeks they will germinate at the holes at the base, and will soon come up, giving frequent waterings, and continue them always in the stove, shifting them occasionally into larger pots, being careful at each removal to preserve the ball of earth about their roots, and not to break the fibres.

COFFEA, Coffee-tree.

It consists of one beautiful evergreen shrub for the hot-house, producing both flowers and fruit in England; and its fruit or berries are the Coffee.

Class and order, *Pentandria Monogynia*.

Characters.] CALYX is small, four-parted, and placed on the germen. COROLLA is monopetalous, funnel-shaped, tubular below, plane and five-parted at top. STAMINA, five filaments placed in the tube of the corolla, and linear, incumbent antheræ. PISTILLUM, a roundish germen, single style, and two thick, reflexed stigmas. PERICARPIUM, an oval, umbilicated berry, having two hemispherical seeds.

The species is,

COFFEA arabica.

Arabian Coffee-tree.] Coffea with an upright brown stem, branching by pairs opposite, ten or twelve feet high, each pair crossing that immediately below it, and diminishing in length upward, garnished with large, oblong-oval, waved, opposite leaves; and at the sides of the branches, close-fitting clusters of pure white quinqued flowers, succeeded by oval berries, ripening to a blackish colour.

This is a very ornamental evergreen shrub, a native of Arabia Felix and Æthiopia, and requires the temperature of a hot-house in this country; so must always remain in pots of rich light earth, and reside constantly in that department, where it will continue its verdure beautifully the year round, produce flowers and ripe berries, and effect an ornamental appearance at all seasons, but more particularly in autumn and winter, when furnished with fruit.

It is raised from seed, i. e. the berries; and those produced here in our stoves will grow; observing, that as they soon lose their germinative property, it is eligible to sow them as soon as possible after they ripen. Let them be sown in pots of light rich earth half an inch deep, and plunge the pots in the bark-bed, giving light sprinklings of water once a week, and in about a month the plants will appear, which, when three inches high, prick into separate small pots, give a little water, and plunge them again in the bark-bed,

and afford them shade from the sun till they have taken root, repeating the waterings moderately as you shall see occasion, and give them air in common with the other exotics of the same department.

This tree is also sometimes propagated by layers and cuttings, which, however, emit roots rather reluctantly; but it is worth the trial, planting them in pots of good earth, and plunge them in the bark-bed, supplying them duly with water and occasional shade.

The general culture of this tree in this country is—It must remain continually in the stove, have water two or three times a week in summer, and about once or twice a week in winter, and fresh air admitted in common with the other exotics of the hot-house; and as it advances in growth, allow it larger pots in proportion. Likewise, every year or two shift it into fresh earth, observing, at each time of removal, to trim off all dry matted roots on the outside of the ball, as also part of the old earth; then placing the plant in the pot, fill it up with fresh compost, none better than good light kitchen garden earth, and directly give water, and plunge the pots in the bark-bed.

Cleanliness is also essential in the culture of this shrub here in our stoves; therefore, when it has contracted much dust or filth, let all the branches and leaves be well washed.

Likewise observe, that as it is frequently attacked by insects, particular attention is necessary, when these appear, to wash and clean every branch and leaf one by one, which should be repeated as often as the vermin make their appearance; but if they are very numerous, it is a sign of ill health and weakness in the plant, and it proceeds chiefly from the root; therefore, in such a case, it is advisable also to shift the plant into entire fresh earth, and plunge it into the bark-bed; and when it recovers its health and vigour, the insects will disappear.

COLCHICUM, *Colchicum*, or Meadow-Saffron.

This genus furnishes a beautiful collection of bulbous-rooted, very low, flowery perennials for the borders, possessing the singular circumstance of their leaves appearing at one time, and their flowers at another; the former rising long and narrow from the root in spring, and decay in June; and the flowers, which are monopetalous, long, tubular, six-parted, and erect, rise naked, also from the root, in autumn, not more than four or five inches high.

Class and order, *Hexandria Trigynia*.

Characters.] CALYX, none. COROLLA is
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monopetalous, formed into a long tube, rising directly from the root, widening and divided above into six spear-shaped-oval, concave, erect segments. STAMINA, six awl-shaped filaments, and oblong, incumbent, quadri-valvular antheræ. PISTILLUM, a germen buried in the root, three long, slender styles, and reflexed, channelled stigmas. PERICARPium, a trilobate, trilocular capsule, having many roundish seeds.

The species are,

COLCHICUM autumnale.

Autumnal Common Meadow Colchicum.

Colchicum with an oblong-roundish, dark-brown, bulbous root; erect, plane leaves six inches long, and one or two broad; and flowers arising without foot-stalks directly from the root, having an erect tube three or four inches in length, widening above, and divided into six oval segments, in colour different in different varieties.

Varieties are,] Common Autumnal Colchicum with single purple flowers—double purple flowers—many-flowered purple—variegated purple—with white single and double flowers—many-flowered white—white and red flowers—rose-coloured single and double flowers—variegated rose-coloured flowers—red flowers—red and white flowers—yellow flowers—broad leaved—striped leaved.

2. *COLCHICUM montanum.*

Mountain Spanish Colchicum.

Colchicum with an oblong, roundish, very dark coloured, bulbous root; long, narrow, spreading leaves; and reddish flowers, rising without foot-stalks directly from the root, having a long tube divided into six narrow segments, and yellow stamina.

Variety.] Mountain Colchicum with striped red flowers.

3. *COLCHICUM variegatum.*

Variegated Chequered Eastern Colchicum.

Colchicum with an oblong, flattish, bulbous root; broad, waved, spreading leaves; and large flowers, rising without foot-stalks directly from the root, divided into six long erect segments, beautifully chequered with red, white, and crimson.

Varieties.] Variegated chequered Colchicum with double flowers—with plane leaves, and single and double chequered flowers.

The first of these three species, *Colchicum autumnale*, in its single purple state, grows wild in many of our rich meadows; but which, and all its varieties, being singularly ornamental, is also common in many curious gardens.

All the species and respective varieties are hardy, and are pretty autumnal ornaments

for the fronts of flower borders; their nature of growth is, they produce their leaves commonly in spring, though those of the second sort often rise the beginning of winter, and those of all the sorts continue their growth till June, then totally decay, and the root in a manner remains dormant till August or September, when the flowers burst forth from it entirely naked, without foot-stalk, calyx, or foliage, each flower consisting of one leaf, formed into a long erect tube, from three to five or six inches long, standing on the root, and divided at top into six oval, erect segments; the lower tubular part supplies the place of a foot-stalk to the upper divisions; and when the flowers fade, the seed-vessels form within the ground, and slowly raise themselves among the green leaves the following spring, and the seeds ripen in May or June.

These plants may either be planted in beds by themselves, in rows nine inches asunder, or may be dispersed in the fronts of the different borders; observing, in either method, they should be planted three inches deep: and the season either for procuring roots to plant, or to transplant those already in your possession, from one part of the garden to another, or into fresh beds, &c. is when their leaves decay in summer; and the best time is from the beginning or middle of June until the beginning of August, after which time they will soon emit new fibres, and should not be removed, nor those already up be kept longer out of ground; if you would have them flower in perfection the same autumn.

They should be removed every two or three years at least, when the bulbs will be increased into large bunches, so should be taken up and separated. See BULBOUS-ROOTS.

Most of these bulbs are so vegetative, that they will flower as they accidentally lie out of ground; but this greatly weakens them.

Propagation.

Their propagation is by off-sets of the bulbs, of which they are very prolific, which are to be taken up and divided at the decay of the leaf in summer, as above hinted, planting the whole again before the middle of August.

New varieties are also obtained from seed, which should be sown in boxes, or large pots, in autumn, covering it a quarter of an inch deep, and place them in a warm situation till spring, when the plants will appear, which should have only the morning sun during summer, giving water in dry weather; and in the second summer, when their leaves decay, plant them out in beds to flower.

COLUTEA, Bladder-Sena.

It

It furnishes hardy, deciduous flowering shrubs, and a shrubby, flowering perennial, all of them adorned with winged leaves of many pair of lobes, and butterfly-shaped flowers growing in clusters, and are elegant furniture for the shrubbery.

Class and order, *Diadelphia Decandria*.

Characters.] CALYX is monophyllous, bell-shaped, five-parted at top, and permanent. COROLLA, is papilionaceous, varying in figure in different species. STAMINA, ten filaments, one of them separating from the rest, and simple antheræ. PISTILLUM, an oblong, compressed germen, a rising style, and a linear, bearded stigma. PERICARPIUM, a large, swollen, bladder-shaped, transparent, unilocular pod, having kidney-shaped seeds.

The species of our gardens are,

1. COLUTEA *arborescens*.

Tree Colutea, or Common Bladder-Sena.] Colutea with an upright, woody, whitish stem, branching laterally, and divided upward into a branchy head twelve or fourteen feet high, garnished with winged leaves of four or five pair of oval-obcordated lobes, terminated by an odd one; and from the sides of the branches, numerous small clusters of pale yellow flowers, succeeded by large bladder-shaped pods.

2. COLUTEA *pocockii*.

Pocock's Early Colutea.] Colutea with an upright, woody, whitish stem, branching six or seven feet high; winged leaves, of nine pair of oval-obcordated lobes, terminated by an odd one; and deep yellow flowers.

3. COLUTEA (*orientalis*) *cruenta*.

Oriental Red Colutea.] Colutea with a woody stem, branching six or seven feet high; winged leaves of several pair of wedge-form, obcordated lobes, ending in an odd one; and blood-coloured yellow-spotted flowers.

4. COLUTEA *frutescens*.

Shrubby Ethiopian Scarlet Colutea.] Colutea with a shrubby stem, branching from the sides erectly four or five feet high; winged leaves of ten or twelve pair of oval-oblong, hoary, whitish lobes, terminated by an odd one; and at the upper part of the branches, many small bunches of scarlet flowers, succeeded by large, swollen pods.

The flowers of all the sorts are of the pea-bloom, or butterfly kind, consisting each of a standard, two wings, and a keel. See PAPILIONACEA.

They are all hardy enough to succeed in the shrubbery, but the fourth species requires a warm situation; they flower abundantly in June and July, succeeded by numerous pods, furnished with ripe seeds, from which all the

sorts may be raised plentifully in the common ground.

The first three species are very ornamental, both in their beautiful pinnated foliage, and their numerous flowers, in June and July, as well as their bladder-shaped pods an inch or two long, which produce an agreeable variety in autumn; all of which are proper ornaments for any of the shrubbery plantations, as they prosper freely in any common soil and exposure, in common with other hardy flowering shrubs.

The fourth species is a most elegant plant, and flowers beautifully in June and July, but is rather of tender quality, being impatient of severe frost; so should have a sheltered sunny situation, and dry warm soil, and it is also proper to retain some in pots, to move to shelter of a green-house, or deep frame, in winter; observing, as the plants, at any rate, are apt to go off in two, three, or four years, a supply should be raised every year or two from seed, which when sown early in spring, the plants often flower the same year in August and September.

Propagation of all the Sorts.

The first, second, and third sorts are raised abundantly from seed, sown in February or March half an inch deep in a bed of common earth, and the plants will rise freely, and be fit to transplant in nursery rows in spring following, and in two or three years will be ready for the shrubbery.

They also grow by layers, layed any time in autumn, winter, or spring.

The fourth species, *Colutea frutescens*, is also raised from seed, sown half an inch deep in a warm border in March or April, and when the plants are three inches high, transplant them, some in a sheltered border, and some in pots, to move under shelter the following winter. But if you would have the plants forwarder, or to flower the same year, sow the seed in pots, and plunge them in a hot-bed early in March; it will forward them considerably, that the plants will probably flower in July or August.

COMPOSITUS *Flos*. Compound Flower, i. e. composed of numerous flosculi, or small florets in the same calyx, as in daisy and sunflower.

All Compound Flowers are aggregate. See AGGREGATUS *Flos*.

A compound flower is defined to be formed of an aggregate, or union, of several distinct fructifications, or many small florets, or lesser flowers, within one common cup or calyx, and each floret furnished with a proper fructification, either all hermaphrodites, or males and females,

females, or hermaphrodites or males in the disk or middle, and females in the radius or circumference, and all the hermaphrodites having each five stamina, and these always united by their antheræ or tops into a cylinder, through which passes the style, crowned with a divided stigma, having both the divisions or segments revolute, or rolled back, and each floret succeeded by a single naked seed, which is either coronated with down, &c. as in dandelion; or the crown is wanting as in sunflower.

Examples of Compound Flowers, are daisy, feverfew, marigold, sunflower, aster, chrysanthemum, hawk-weed, centaury, African marigold, dandelion, and many others; all of which are formed of many florets in one common cup, as above described.

All Compound Flowers, which are a numerous tribe, are of the class *Syngenesia*. See CLASSIS.

The other general properties of a Compound Flower are,

The common or general calyx is formed either of one series of leaves immediately surrounding the receptacle and floscules or florets, or of a double series, frequently a lesser and a greater, and is sometimes imbricated, i. e. formed of many scales.

The lesser flowers or florets that form the Compound Flower are universally monopetalous, i. e. of one petal, sitting close upon the receptacle, and are of different figures and sizes in different genera; and under each floret is generally placed a single seed.

The compound flowers have different appellations, according to the form, or figure, and situation of the florets of which it is composed.

They are generally distinguished by the following appellations.

Tubular Compound Flower, (*tubulosus*, or of hollow florets); all the florets that compose the flower are tubular and funnel-shaped, that is, hollow almost from bottom to top, and divided into five spreading parts at the brim, and which kind of florets, when they compose entirely the whole Compound Flowers, are mostly all hermaphrodites, having each five stamina and a style; though there are tubular male and female florets, common to some genera; also hollow neutral florets.

Ligulated Compound Flower, (*ligulatus*, flat or strap-shaped florets); the florets that compose the flower are all plane, flat, and expanded, and resemble a strap, fillet, or tongue, and are either entire at top, or divided into three or five parts, and which kind of florets,

when they form entirely any compound flower, are commonly all hermaphrodites, and have each its five stamina, style, and naked seed, as in hawkweed, dandelion, and many other genera; but there are also ligulate male and female florets, sometimes in the same or different flowers.

Radiated Compound Flower, (*radiatus* or *radius*, a radiated margin or circumference); having one, two, or more series of long flat florets placed round the margin or outward part, in form of a ray, or resembling the rays proceeding from the body of the sun, as in sunflower; and the disk (*discus*), or central part, is formed by numerous small tubular florets, exemplified also in sunflower, marigold, &c. In most radiated compound flowers, the radius is generally formed of ligulated or plane florets, as in sunflower and marigold just mentioned, and are commonly all females or neutrals; and the tubular florets in the disk are generally all hermaphrodites or males; but in some genera the radius is formed by long tubular florets, unlike those in the centre, as in centaury or blue-bottle; and in some the florets in the radius are naked, that is, without petals altogether.

It is mostly to be observed, that both tubular and flat florets, in all Compound Flowers that are not radiated, are generally all hermaphrodite.

And in radiated Compound Flowers, the florets which occupy or form the disk, are, for the general part, all hermaphrodite or male; and the semi-florets, or others that constitute the rays, are most commonly females or neutrals.

Neutral florets are such as want both stamina and style, and are of no sex, or neuter.

Naked florets are such that have no petal or corolla.

But Compound Flowers are constituted several ways, as,

Tubular hermaphrodite florets, both in the disk and radius.

Tubular hermaphrodite florets in the disk, and tubular females in the radius.

Tubular hermaphrodites in the disk, and tubular neutrals in the ray.

Tubular hermaphrodites in the disk, and ligulate hermaphrodites in the radius.

Tubular hermaphrodites in the disk, and ligulated females in the radius.

Tubular hermaphrodites in the disk, and ligulated neutrals in the ray.

Tubular hermaphrodites in the disk, and naked females in the radius.

Tubular male florets in the disk, and naked females in the ray or radius.

Ligulated

Ligulated hermaphrodites both in the disk and radius.

As to the number of florets in a Compound Flower, they are generally very numerous and indeterminate.

In some genera the florets of the Compound Flower have small distinct cups within the larger, and belong to the fifth order of the class *Syngenesia*.

Of Double Compound Flowers.

Plenitude or doubleness in Compound Flowers is effected different ways.

As, for example, radiated Compound Flowers, which generally have plane florets in the margin, and tubulars in the disk, are rendered double two different ways; that is, the plenitude may either be effected by an increase of the radius, and an almost total exclusion of the tubular florets in the disk, or is effected by an elongation of the hollow florets in the centre, and a less profound division of their brims. In the first mode of impletion, which is termed impletion by the radius, it is evident that a radiated flower, rendered double by the radius, will be either almost entirely female florets, as in feverfew and African marigold; or of neutral florets, as in sunflower: and in the second mode of impletion, termed impletion by the disk, the florets of that part are extended to a great length, and those of the radius, though they sometimes remain unchanged, most commonly adopt the figure of those of the disk, without, however, suffering any alteration in the point of sex. Daisy, feverfew, and African marigold, exhibit instances of this, as well as the former mode of impletion.

The impletion of tubular Compound Flowers seems to observe the same rule as that of the radiated flowers just delivered.

COMPOSTS. In gardening, Composts are compounds or mixtures of several earths, or earthy substances, and dungs, either for the improvement of the general soil of a garden, or of that for some particular plants.

Almost every plant in nature may be said to have some particular favourite soil; and yet there is hardly any plant or tree but what will prosper in common garden earth; and even the most delicate plants of our green-houses, stoves, and hot-beds, are found to succeed in common rich light mould, of the quality of that of a good kitchen garden; so that none need be at any great loss on the consideration of Composts. I would observe, however, that many kinds of plants may be farther improved by Composts adapted to the soil of their natural growth; but, on the other hand, would be understood to mean, that only a few differ-

ent Composts are necessary for all the known plants in the world; which we can affirm for the satisfaction of the unexperienced, and not perplex them with tedious directions in every genus, for preparing expensive and troublesome Composts for every species thereof, which is altogether unnecessary.

As, for instance, a rich moderately light Compost, of the texture of kitchen-garden earth, is agreeable to most plants; a loose light Compost for some particular plants; a dry, sandy, rubbishy Compost for others, such as most of the succulent tribe; and a loamy fattish Compost, of a pliable mouldery temperature, is particularly well adapted to most sorts of trees and shrubs, and indeed to most plants that are not succulent.

But prepared Composts are principally in practice for plants in pots, and for some curious flowers in beds, and tender plants in hot-beds, &c.

In respect, however, to Composts for the amendment of the general soils of a garden, several species of earthy substances may be employed, according as the quality of the natural soil shall require; as, for instance, if the natural soil is of a very light, loose, or sandy quality, it may be assisted occasionally by the addition of heavy substances, such as loam, and any kind of fattish earth, mud of ponds and ditches, with plenty of rotten dung; on the other hand, heavy, clayey, and all stubborn soils, may be meliorated by light Composts, i. e. any light sandy earth, drift and sea-sand, the shovellings of turnpike-roads, the cleansing of streets, all kinds of ashes, rotten tanner's-bark, rotten wood and saw-dust, and other similar light opening materials that can be most conveniently obtained, adding to any, or all of them, a convenient portion of dung.

As to Composts for particular curious plants, to be preserved in pots or tubs, beds, &c. the following are in practice.

One principal Compost in practice is fresh or maiden earth from a pasture-ground, that is, of a light, but fattish mouldery temperature; and if it inclines to loam of a pliable texture, it will be an advantage; however, of any fat pliable pasture earth, take the top spit, turf and all, and to which add about one third or fourth part of thoroughly rotten dung, and lay the whole in a long heap or ridge a yard high, in a situation exposed to the sun and air, several months, turning it over occasionally, that the whole may be converted to mould, and the parts properly incorporated; and this will be found to answer almost every purpose of vegetation. But in default of good pasture

pasture earth, which is sometimes inconvenient to be obtained, a quantity of good garden mould of the above quality will answer very well; but more particularly that which has been well cultivated by proper manure, which may at all times be procured from the quarters of the kitchen garden: add thereto one third or fourth part of rotten dung, none better than that of old hot-beds; and if the mould is rather of a stiff nature, add also about a fourth part of sea or drift sand, or, for want of these, ashes, or rotten tan, &c. casting the whole in an heap, to lie five or six months, but if a year the better, stirring it over several times, as above directed.

Another Compost in use is that for plants that particularly require a more light, loose soil; a Compost may be formed of one half good light pasture mould, or that of a garden, and about one third part of sand, and another of rotten dung, forming the whole in a heap as above.

For plants that require a soft, loose, rich earth, use for Compost good light rich earth of a garden or pasture, rotten tanner's-bark, or rotten earthy wood, saw-dust, tree leaves, rotten dung, and a small portion of sand.

For plants that delight in dry rubbishy soils, as the succulent tribe, form a Compost of one half of perfectly light garden or pasture mould, and one half of sand or road soil, and a little screened lime rubbish, laying the whole in a heap for a few weeks or months, and turn it over two or three times in a mixed order; which Compost may be made lighter or heavier, according as the plants are more or less succulent.

A loamy Compost, as already hinted, is a favourite soil of numbers of plants; that is, though most plants will flourish in any kind of good earth, or the Composts before mentioned, yet that of a light, warm, loamy temperature, is found to improve the culture of almost all sorts of plants, but more particularly all the tree and shrub kind: this Compost is thus prepared; maiden or fresh loamy earth from a common, or any dry pasture-ground, where the soil is of a soft and moderately light pitiable nature (see LOAM), taking the uppermost spit, sward and all, chopping it to bits, and add thereto rotten dung, as before directed, which, after lying in a ridge or heap twelve or fifteen months to rot the sward, and by frequent turnings over to break the lumps, and mix the parts, will be excellent for use; when, if necessary, it may either be made lighter by the addition of some of the fore-mentioned light materials, or made heavier by a mixture of fat garden earth, according as

the nature of particular plants shall require, which will be always hinted in the culture of the respective articles, whether in pots, beds, or borders.

The florists are generally curious in their compositions for their fine prize flowers; the following are their auricula and hyacinth Composts, but which will also answer for almost all other curious flowers.

For auriculas, the favourite compost is light earth from a pasture ground, the top spit with the sward, and neat's dung, of each an equal portion, and about half the quantity of drift or sea-sand, and, when it can be had, a little rotten willow earth, or any rotten earthy wood, or old rotten tan or saw-dust, forming the whole in an heap for several months, or a year, turning it over several times at proper intervals.

This Compost is also proper for many other curious flower plants, such as the fine carnations, curious ranunculuses, and anemones; and for which, to make it go farther, you may add a quantity of good garden mould; observing, however, that though these flowers often excel in the above Compost, yet I have observed them flower almost equally well in common, rich, light, garden earth.

For the hyacinth, the favourite Compost is different from the above, though that will answer tolerably well, as will also some of the other light Composts, and they even often prosper well in good garden earth; however, curious florists, to blow that delightful flower in its highest perfection, often use the following Compost—Neat's dung and drift sand, of each an equal portion, and half the quantity of old rotten tan, and where it can be easily procured, the same portion of rotten leaves of trees, or, in lieu thereof, add a little more rotten bark, and a proportionate quantity of light earth from a pasture or garden; let the whole be mixed in a heap, to lie at least a year, giving it frequent turnings; but if it remains in the heap fifteen or eighteen months, it will be an advantage.

With one or other of all the above Composts you suit all sorts of plants sufficiently, of which directions are given in the culture of all the respective articles; and any of the sorts of Compost may always, upon occasion, be eked out by an addition of garden earth, in proportion to the intended temperature of each respective Compost.

But where any particular Compost is necessary, it is exhibited in treating of the culture of the respective articles.

In all Composts where sand is necessary, sea or drift-sand is to be preferred, and that which

which is dug out of pits is the most improper of all; therefore, where sea-sand cannot be easily obtained, which is rather the best, always chuse drift-sand, or that taken near the surface.

Likewise in Composts where rotten earthy wood is requisite; that of old rotten willow trees, or any other that can be had, will do; or, in default thereof, old rotten tanner's bark may be substituted, and is a very proper ingredient; also all sorts of wood saw-dust may be used.

In using garden mould occasionally for Composts, the places of the quarters from whence it is taken may readily be made good by a due supply of manure, and the emptyings of pots of old earth, and old flower-beds, &c. which being wrought up together with the natural soil, will be excellent for the growth of kitchen vegetables.

All Composts should be formed in an open exposure, free to the sun, air, rains, frosts, &c. to meliorate and fertilise the soils; and the ingredients should be formed in an heap, not in a large and high one, but rather extended in length like a ridge, about a yard or four feet thick, so that the rays of the sun may penetrate through it: once every two or three months, at least, it ought to be turned over, and the bottom thrown to the top, that all the parts may be well mixed, and equally participate of the influence of the sun and elements; this is so essential, that if the heap is not thus exposed, the Compost would be far from affording the proposed advantage to the plants, and would to many sorts rather prove detrimental, so that it would be more eligible to use common garden mould immediately from a well-cultivated border or quarter.

It is necessary that all Composts for plants in pots, tubs, &c. also for all tender plants in hot-beds and flower-beds, should remain several months in the heap or ridge before it is used, especially those Composts formed of fresh earth and other new materials, which should always have a summer's sun and winter's frost, and frequent stirring, for the whole should be perfectly meliorated, and converted to a pure mould.

When the Composts are to be used, it is not advisable to screen them, except for some particular purposes, which are hinted in different parts of the work; so that, for general uses, the soil should only be broken fine with the spade and hands, for, when fine screened or sifted, it becomes too compact for the roots of plants.

The term *maiden* or *virgin* earth, often mentioned for Composts, signifies that of any

common, or other pasture ground, that has never been ploughed for the production of other crops, or, at least, that has been a long time in pasture.

COMPTONIA.

This genus furnishes a hardy deciduous tree, for ornamental plantations, with fern-like leaves, and monœcious, apetalous flowers.

Class and order, *Monœcia Triandria*.

Characters.] Male and female flowers apart on the same tree, the males collected into cylindric, imbricated, loose amentums. CALYX, a diphyllous cup. COROLLA, none. STAMINA, three short filaments, topped with bivalve antheræ. The females collected into ovate, imbricated, close amentums. CALYX, a six-leaved cup, membranaceous at the base. COROLLA, none. PISTILLUM, a roundish germen, with two capillary styles. PERICARPUM, the germen becomes an oval, unilocular nut.

The species is,

COMPTONIA asplenifolia.

Spleenwort-leaved Comptonia.] Rises with an upright stem branching to twenty or more feet high, oblong leaves, sinuated on their edges alternately, very deep; and saffron-coloured florets in amentums, succeeded by roundish fruit.

This tree is very hardy, and will succeed in almost any soil; it is propagated either by seeds or layers. By seeds:—sow the seeds about an inch deep in a bed of light earth in the spring, and the plants will come up the next year, observing to keep them clear from weeds, and giving occasional waterings in dry weather.

By layers, lay the young summer shoots in autumn by slit laying, and in two years they will be well rooted, when they may be taken off and transplanted.

CONIFERÆ, Coniferous, or Cone bearing; plants which bear that kind of fruit or seed-vessel, called a Cone. See CONUS and STROBILUS.

The plants of this tribe are mostly of the tree and thrub kind, and retain their leaves all the year, except some sorts of larch, which lose their leaves during the winter.

The principal genera of the Coniferous tribe are, the *pinus*, or pine-tree, including fir, larch, and cedar of Lebanon—the *cupressus*, cypress-tree—*Thuja*, arbor-vitæ—*ephedra*, shrubby horse-tail—*juniperus*, juniper-tree, including savin, and several species of cedars. The height of some species of *juniperus* does not exceed two feet, that of some species of *pinus* approaches to a hundred; their form is generally conical, and extremely beautiful.

tiful, from the disposition of their branches, which surround and cover the stem even to the root, and extend themselves horizontally and circularly, like so many rays.

Most of the Coniferous trees are resinous, or gummy; these gums have a bitter taste, but very agreeable smell; and it is said, plantations of them are exceeding wholesome, by meliorating the air by their balsamic and aromatic exhalations, besides being beautiful to behold.

From the larch-tree is extracted what we erroneously call Venice turpentine; from the wild pine, or pinaster, is extracted the common turpentine, and from which is distilled the oil of that name; the dregs of the distillation form the common rosin: the pitch-tree, a sort of fir, produces the substance from whence it derives the name. The branches of the black and white spruce-firs are used by the Americans in making their spruce-beer; the leaves of the common savin are used by farriers for destroying worms in horses. A decoction in milk of the seeds of pinaster, or of the extremities of the branches pulled in spring, is said, with a proper regimen, to cure the most confirmed and inveterate scurvy.

All the sorts are hardy and valuable plants in ornamental gardening, and many of them most valuable timber trees, particularly the genus *pinus*; none are more ornamental when growing, or turn to more profit when felled, for they arrive to great height and magnitude, and, as timber, are superior for most kinds of buildings, and most excellent for masts of ships.

The timber of the horizontal cypress is said to resist worms, moths, and all putrefaction, and to last many centuries; the doors of St Peter's church at Rome, it is said, were originally of this material, which, after lasting eleven hundred years, discovered not the least tendency to corruption.

But for the culture, and other particulars of the Coniferous trees, see their respective genera.

CONVALLARIA, Conval-Lily, or Lily of the Valley, and Solomon's-Seal.

This genus consists of hardy, herbaceous, flowery perennials, producing annual stalks from six inches to a yard in stature, adorned with oblong, ribbed leaves, and monopetalous, small, bell-shaped flowers, and are eligible furniture for the pleasure-ground.

Class and order, *Hexandria Monogynia*.

Characters.] CALYX, none. COROLLA, monopetalous, bell-shaped, six-parted, and spreading at the brim. STAMINA, six filaments inserted into the corolla, and erect an-

theræ. PISTILLUM, a globular germen, slender style, and obtuse, trigonous stigma. PERICARPium, a round, trilocular berry, and single seed.

The species of our gardens are,

1. CONVALLARIA *maialis*.

(*May Conval Lily*)—or *Lily of the Valley*.]

Convallaria with a fibrous, creeping, white root, oblong, erect, longitudinally-veined leaves, in pairs, five or six inches long, and one or two broad, and among them naked flower-stalks half a foot high, garnished with small, drooping, white flowers, ranged in a single series on one side the stalk.

Varieties.] Lily of the Valley with single white flowers—double white flowers—red flowers—purple and white striped flowers—double purple and white flowers.

This species and varieties grow naturally in woods and shady places, in many parts of Britain, and other parts of Europe; but all of them possess great merit as flower-plants for shady-borders, and the compartments of wilderness works, and the like, though they will succeed any where; and those of the double and striped kinds, particularly, are very beautiful.

2. CONVALLARIA *Polygonatum*.

(*Polygonatum officinale*)—or *Common Solomon's-Seal*.] Convallaria with a thick, knotty, fleshy, fibrated, white root; upright, two-edged, firm stalks, ten or twelve inches to two feet high, garnished with oblong-oval, ribbed, alternate leaves, their base embracing the stalk; and from their axillas, short divided foot stalks, each supporting one drooping white flower.

Varieties.] Common Solomon's-Seal with single white flowers—double white flowers—sweet-scented white flowers—with purple stalks and white flowers.

This, and varieties, as well as ornamental plants in gardens, are of medical property, and the root is the part chiefly used, being frequently applied as a poultice to green wounds and bruises, and a decoction of the plant cures the itch: the knotty root cut through transversely having particular marks, appearing of some resemblance to a seal, hence the name Solomon's Seal is derived.

3. CONVALLARIA *multiflora*.

(*Multiflorous Solomon's Seal*.] Convallaria with a thick, jointed, fibrated, white root; upright round stalks near a yard high, garnished with broad, oblong-oval, alternate leaves, embracing the stalks with their base; and from their axillas, short foot-stalks, supporting many greenish-white flowers.

Varieties.] Large Broad-leaved Multiflorous Solomon's-

Solomon's-Seal with single and double flowers
—Dwarf Multiflorous Solomon's-Seal with striped leaves.

4. *CONVALLARIA racemosa*.

Racemous-flowered Solomon's-Seal.] *Convallaria* with a thick, knotty, fibrated root; upright stalks two feet high; oblong, pointed, ribbed, close-fitting, alternate leaves; and the stalks terminated by racemous spikes of greenish-white flowers.

5. *CONVALLARIA verticillata*.

Verticillated-Narrow-leaved Solomon's-Seal.] *Convallaria* with a thick, jointed, fibrated, white root; upright angular stalks two feet high; long, narrow, smooth leaves, in a verticillus or whorl round the stalks; and from the places of the leaves, short foot-stalks, each supporting four or five small whitish flowers.

The flowers of all these species are monopetalous, bell, or funnel-shaped, rather small, and divided at the brim into six spreading segments, appearing in May and June, succeeded by round berries, furnished with ripe seeds in autumn.

They are all perennial in root, but the stalks and leaves are annual, rising in spring, and perishing in autumn.

All the sorts are hardy, and delight in shady places, so are well calculated as ornamental furniture for the borders of wood-walks, wilderness quarters, and shady borders, where they will appear very ornamental both in their singular growth, foliage, and flowers; but all the sorts will also grow in almost any situation, and multiply exceedingly by their creeping roots, may be planted in spring or autumn; giving the common occasional culture of the other border plants, of weeding, hoeing, &c. and to cut down their decayed stalks, and every three or four years to reduce their spreading roots within due compass.

Propagation.

The propagation of all the sorts is effected abundantly by dividing or slipping their roots any time from autumn till spring, though those divided and planted out in autumn will flower strong the following summer; the slips may be planted at once where they are always to remain, or as may be required; and they need not be removed oftener than every three or four years, or only when they are greatly increased in the roots, may either be taken up, reduced and re-planted, or, as they stand, have the roots trimmed to proper regularity.

CONVOLVULUS, *Convolvulus*, Bind-weed, or Bear-bind.

This genus comprises many herbaceous twining and trailing plants, annuals and per-

ennials, of which there are some of very flowery growth, and proper ornaments for the pleasure-ground, and one or two for the green-house, all of them adorned principally with spear and heart-shaped leaves, and large open bell-shaped flowers.

This genus derives the name, *Convolvulus*, from *convolvere*, i. e. to roll round, or twine about, as most of the plants wind and ascend spirally round any support.

Class and order, *Pentandria Monogynia*.

Characters.] *CALYX* is monophyllous, oval, five-parted at top, and permanent. *COROLLA* is monopetalous, large, bell-shaped, and spreading. *STAMINA*, five short filaments, and compressed antheræ. *PISTILLUM*, a roundish germen, slender style, and two broad, oblong stigmas. *PERICARPIUM*, a roundish capsule, having several roundish seeds.

There are upwards of a hundred species, but not a quarter of them have merit in gardening, and some are common and very troublesome weeds, such as the trailing Field Bind-weed, and the Large Volubilate White Bear-bind, both of which are species of *Convolvulus*; the latter, in particular, is often very troublesome in gardens in summer, by its winding stalks, which twine about any thing they encounter, either along the surface of the earth, or ascend spirally about tall plants or trees ten or fifteen feet high.

The species of this genus, therefore, that merit culture, are principally for ornamental purposes; and the following are the most material species in our gardens.

The first three are hardy herbaceous annuals.

1. *CONVOLVULUS tricolor*.

Three-coloured Convolvulus, commonly called Convolvulus Minor.] *Convolvulus* with prostrate, branchy stalks two feet long, trailing on the ground, garnished with spear-shaped-oval, close-fitting leaves; and at their axillas, long foot-stalks, each supporting one large, tri-coloured flower, light blue, having a white and yellow bottom.

Varieties.] *Convolvulus Minor* with blue flowers, having white bottoms—with white flowers—variegated blue and white flowers.

This species and varieties are very floriferous annuals; the stalks generally prostrate themselves along the ground, without any twining or climbing property, spreading their branches every way, flowering at every joint from June till September.

2. *CONVOLVULUS purpurea*.

Purple Convolvulus Major.] *Convolvulus* with twining, spirally ascending stalks and branches,

branches, winding about support six or eight feet high, adorned with roundish, heart-formed, entire leaves; and from the sides, erect foot-stalks, supporting large, open, purple-coloured flowers.

Varieties.] *Convolvulus Major* with deep purple flowers—red flowers—blue flowers—white flowers.

These varieties are very flowery and beautiful annuals; and if their stalks have support to climb upon, they will flower at every joint from July till October, succeeded by abundance of ripe seed.

3. CONVOLVULUS Nil.

Anil—or Deep-Blue Convolvulus Major.] *Convolvulus* with twining stalks and branches, mounting about support six or eight feet high, garnished with heart-shaped, three-lobed, hairy leaves, and long axillary foot-stalks, each supporting two large, deep-blue flowers.

This is an exceeding beautiful annual, requires support to climb upon, and will exhibit a fine bloom from August till October.

The two following are shrubby perennials of the green-house.

4. CONVOLVULUS canariensis.

Canary Evergreen Convolvulus.] *Convolvulus* with twining, woody, perennial stalks and branches, winding about support twenty feet high, garnished with heart-shaped-oblong, downy, evergreen leaves, and axillary foot-stalks, each supporting several purplish flowers.

5. CONVOLVULUS Cneorum.

(Cneorum album)—or Silvery Convolvulus.] *Convolvulus* with upright, shrubby, perennial stalks, branchy, and a yard high, closely garnished on every side with spear-shaped, downy, silvery leaves; and at the ends of the branches, cluster heads of reddish flowers.

The flowers of all the species of *Convolvulus* are monopetalous, bell-shaped, large, and spreading, appearing in June, July, August, and September, are very elegant; and although each flower is but of one day's duration, the annual sorts exhibit a daily and plentiful succession till killed by the frost, and ripen abundance of seeds.

They are all natives of distant countries, but have long been inhabitants of our gardens as plants of ornament.

All the annual kinds are hardy, and are beautiful furniture for the pleasure-ground; will prosper in any common soil, and are proper both for borders and the vacant spaces in the fronts of the most conspicuous shrubbery-clumps; and they all rise freely from seed in the full ground, which may be sown where

they are to remain to flower; observing, that the *Convolvulus tricolor*, or *Minor*, may either be suffered to trail upon the ground, according to its natural growth, or may be tied up to sticks; but the other two annual species, and their varieties, being of the voluble or twining running kind, must have tall sticks to climb upon, on which they will naturally twine themselves several feet high, flowering all the way, and appear very ornamental.

The propagation of all these annual kinds is by sowing the seed in March or April, in patches, in the places where they are to flower; in each patch sow four or five seeds half an inch deep, and when the plants are an inch or two high, thin them, leaving but two or three of the best in each patch (see ANNUAL PLANTS), managing them afterwards as above directed.

The two perennial species are tender, but elegant furniture for the green-house collection, and well worth the attention of every one possessed of the conveniencies for preserving them during winter.

Let them be kept in pots of rich earth, and managed as *geraniums*, and *myrtles*, &c. See GREEN-HOUSE PLANTS.

The propagation of these two sorts here is commonly by layers in the spring, which take root freely in three or four months; cuttings of the young shoots also grow freely in a shady border in May, June, and July; suckers from the root also make good plants.

Of this genus, the two following perennials, Bindweed, and Bearbind, before hinted, are well-known troublesome weeds; but as they produce many elegant flowers, some for variety preserve here and there patches of them for flowering.

Their titles, &c. are,

6. CONVOLVULUS arvensis.

Field Perennial Convolvulus, or Small Field Bindweed.] *Convolvulus* with creeping and deeply penetrating, small, fibry, tough roots; many weak, trailing and twining stalks, two or three feet long; garnished with small, triangular, arrow-pointed leaves, the base pointed at both sides; and at all the joints, a single flower on each foot-stalk, of different colours in different varieties.

Varieties.] *Field Perennial Convolvulus* with white flowers—rose-coloured flowers—rose and white striped flowers—white and purple flowers—white and purple striped flowers—purple white-rayed flowers.

All these varieties grow wild in great abundance on the sides of banks and dry gravelly soils, where they exhibit a profusion of flowers; but if some patches are intended for the

the garden by way of variety, great care is requisite to keep their roots within due compass, for they creep far, and their stalks over-run whatever they grow near, and often rise naturally in gardens, proving most troublesome weeds, difficult to eradicate, for the roots run deep, and are so very tough, that gardeners in wrath often call them the devil's guts.

The roots are perennial, and the stalks rise in spring, and die to the root in autumn.

7. *CONVOLVULUS scipium*.

Hedge Perennial Convolvulus, or Great White Bearbind.] Convolvulus with long, creeping, thick, fleshy, white roots, sending up annually many twining stalks, winding round support ten or fifteen feet extent, garnished with large, roundish, and oblong, arrow-pointed leaves, divided at the base; and long peduncles from the joints of the branches, each supporting one large, bell shaped, pure white flower.

Varieties.] Large purple flowers—large purple-striped flowers.

This species grows wild in hedges and gardens, have perennial roots, and annual stalks, ascending spirally round the neighbouring plants, bushes, hedges, and trees, producing many fair flowers; but if some patches are designed as climbers in wilderness-works, or shrubberies, for variety, they should be placed detached from all other plants and trees, and fix long stout stakes, or branchy sticks, for their stalks to twine upon, and keep their roots within small bounds, for they often rise naturally in gardens, and prove most troublesome weeds to the gardener, having very creeping roots, that multiply greatly, run deep in the ground, and the least bit will grow and send up stalks that over-run and twine round every thing in their progress; therefore, in digging the ground, every bit that appears should be carefully picked out, and in summer the stalks should be constantly pulled up, which will also contribute considerably to the destruction of the roots.

The following perennial of the same genus is also cultivated in some gardens for variety.

8. *CONVOLVULUS Batatas*.

Batatas, or Spanish-Potatoe.] Convolvulus with large, oblong, tuberous, white, eatable roots; trailing stalks three or four feet long; heart-shaped-angular leaves; and large, bell-shaped, white flowers; and the stalks rooting at the joints, produce large radical tubers.

This is a native of both Indies, introduced here from Spain and Portugal, where the roots grow very long and large, resembling large white kidney-potatoes; they do not, however,

acquire perfection in England, but the roots are annually imported here from the above countries, and we may often see them exposed for sale in the fruiterers' shops in London. They have a sweetish taste, but inferior to our common potatoes.

If intended to have a few plants for variety, plant the roots, either whole or divided, in a warm border, in March or April, where they will send up stalks, and flower in autumn; but to have them in greater perfection, plant the roots in a slender hot-bed, covered with a frame and glasses during bad weather, by which aid they flower earlier, and often form many tubers at the joints.

CONVOLVULUS, SCARLET.--See *IPOMŒA*.

CONUS, a Cone; a species of fruit, or scaly seed-vessel, of the coniferous trees, as the pine-tree, &c. formed into a conical figure, and commonly called a Cone, *Comus*; but modern botanists have substituted in its place *Strobilus*. See *STROBILUS*.

This species of seed-vessel is formed of an amentum, and composed of many hard woody scales, curiously arranged, and fixed by their base to an axis, which occupies the middle of the Cone, so they open only at top: in many species of pine-tree, the scales of the Cone are of a bony nature, and almost united, as those of the cedar of Lebanon, Scotch pine, &c. in fir, larch, arbor-vitæ, and cypress, the scales are of a substance like hard leather; and in juniper, savin, &c. they are united, and become fleshy and succulent like a berry.--These scales which compose the Cones, serve, at first, each as a calyx to a fructification; and being persistent, they harden by degrees to a bony or very hard substance, serving also as a sort of pericarpium to the seeds, which are lodged naked principally betwixt the bottom of the scales, and by them nourished as in a proper seed-vessel.

The scales of the Cones often so closely involve the seeds, that they cannot be dislodged without violence, by splitting the Cones open with an instrument driven through them, or till they are exposed to the midsummer sun, or before a fire, which causes them to open gradually. See *PINUS*.

The seeds themselves are mostly oblong, hard like a nut, and crowned with a large membranaceous wing.

These seeds or kernels, in some species of *pinus*, are eatable, particularly those of the *Pinus pinca*, or stone-pine, being exceeding wholesome, and good for coughs and consumptions; and in Italy, where the trees abound, they are served up to table with other fruits in the dessert, during the winter season.

CONYZA.

CONYZA, Fleabane.

It consists of herbaceous and shrubby plants, adorned with compound flowers, and of which there is one small shrubby species, pretty common in our green-houses.

It is entitled,

CONYZA *candida*.

White-leaved Under-shrubby Conyza.] Conyza with a short shrubby stalk, branching six or eight inches high; closely garnished with ovate, small, downy, white, silvery leaves; and from the sides and ends of the branches, long woolly flower-stalks, each sustaining two or three yellow compound flowers.

It requires shelter in winter, and is very beautiful in its low bushy growth and silvery leaves: let it be kept in pots of rich earth, to be moved to a green-house or garden-frame, to have shelter from frost; and it may be propagated by slips of its branches in spring, which, if planted in pots, and plunged in a hot-bed about a month, and often watered, will grow freely; but cuttings planted in summer often emit roots without the aid of a hot-bed.

COPAIFERA, Balsam of Capivi Tree.

A large American balsamiferous exotic with decandrious flowers.

Class and order, *Decandria Digynia*.

Characters.] CALYX, none. COROLLA, four acute, oblong, concave, very spreading petals. STAMINA, ten slender incurved filaments, with oblong incumbent antheræ. PISTILLUM, a roundish, compressed, pedicillated germen; slender, incurved style, and blunt stigma. PERICARPIUM, an oval, bivalve legume, containing a single ovate seed.

There is but one species,

COPAIFERA *officinalis*.

Balsam of Capivi Tree.] This tree rises in Spanish-America, to the height of fifty or sixty feet. We have no other description but that the leaves are roundish, and the flowers are of a red colour.

From this tree the Capivi balsam is extracted, by tapping the trunk once—afterwards it will produce no more balsam.

It is propagated by seeds procured from America; which, as soon as arrived, must be sown on a hot-bed; and, when the plants are of a size to transplant, must be potted and placed in the bark-bed of the stove, and treated as other woody plants of the like nature.

CORDIA, Cordia, or Sebesten.

A genus comprising ten or twelve species of exotics, natives of the hot parts of Asia and America, and requiring the aid of a stove to preserve them in this country; one of which, being a superiorly-ornamental flowering-shrub

in its large bunches of funnel-shaped scarlet flowers, is the principal sort retained in our gardens as a curious stove exotic.

Class and order, *Pentandria Monogynia*.

Characters.] CALYX, monophyllous, tubular, dentated at top, permanent. COROLLA, monopetalous, funnel-form, tubulous below, with an erect-spreading border, five or six-parted. STAMINA, five awl-shaped filaments, and oblong antheræ. PISTILLUM, a roundish, acuminate germen, single style, twice two-parted at top, crowned by obtuse stigmas. PERICARPIUM, a globose, acuminate drupe, affixed to the calyx, containing a furrowed nut of four cells.

The species most deserving of notice for our purpose is,

CORDIA *Sebestena*.

(Sebestena)—or Rough-leaved Scarlet Cordia.] Cordia with several shrubby stems, dividing and branching six or eight feet high; garnished with oblong-ovate, waved, rough leaves, alternate, and of a deep-green colour; and, at the termination of the branches, large clusters of rich beautiful scarlet flowers, with a large corolla, having a long tube spreading open above, of very ornamental appearance.

This species being a native of the West-Indies, &c. is tender, and requires to be retained mostly always in a hot-house in this country; so must be planted in pots of good mellow earth, and placed in any part of the hot-house or stove, and managed as other shrubby plants of that department.

It is propagated by seed obtained from the West-Indies, which should be sown as soon as possible in pots of light earth, and plunged in a hot-bed or bark-bed; and when the plants are advanced of two or three months' growth, prick them singly in small pots plunged again in the hot-bed to forward their fresh-rooting: afterwards continued constantly in the stove.

COREOPSIS, Tick-seeded Sunflower.

The plants are herbaceous, very flowery perennials, proper for the pleasure-ground, attaining from three to six or eight feet stature, terminated by clusters of compound radiated flowers.

Class and order, *Syngenesia Polygamia Frustranea*.

Characters.] CALYX, a compound radiated flower, having a double general cup; the outer one is of eight small leaves, and the inner one is large and coloured. COROLLA, many hermaphrodite tubular florets form the disk, and eight large flat neutral ones the ray. STAMINA, five short filaments, and cylindric antheræ. PISTILLUM, a compressed germen, slender style, and bifid stigma; but no style nor

nor stigma in the neutrals. PERICARPIUM, none. SEMINA, each hermaphrodite floret succeeded by an orbicular seed, bordered and horned at top.

The species of most note are the three following perennials.

1. *COREOPSIS alternifolia.*

Alternate-leaved Virginia Coreopsis.] Coreopsis with upright strong stems seven or eight feet high, garnished on every side with spear-shaped, sawed, alternate leaves, having decurrent, winged or bordered foot-stalks, running from the base of one to the other, and the stems crowned by large, radiated, yellow flowers.

2. *COREOPSIS tripteris.*

Ternate-leaved American Coreopsis.] Coreopsis with upright, round, smooth stalks, six or seven feet high, garnished at each joint with ternate, opposite leaves, and the stalks terminated by bunches of large flowers, having a yellow radius and purple disk.

3. *COREOPSIS verticillata.*

Verticillate Multifid-leaved Coreopsis.] Coreopsis with upright, angular, stiff stalks, three or four feet high, branching by pairs, adorned round the joints with compound-winged, finely divided leaves, in whorls; and from the sides of the branches, long foot-stalks, each supporting one flower, having a dark-purple middle, and bright-yellow ray.

These have all perennial fibrous roots, and annual stalks, which rise in spring, flower from July till October, and decay to the root in November.

The flowers are all compound, radiated, and pretty large, shaped like sunflowers but smaller, and are very ornamental.

All three species are good furniture for the large compartments of the pleasure-ground, either for spacious borders, or the shrubby plantations, introducing them in the vacant spaces between the shrubs, on the boundaries of lawns or principal walk; for all of them will exhibit a plentiful bloom from July or August, until prevented by frost.

Their propagation is easily effected by slipping or dividing the roots in autumn, when the stalks decay, planting the slips at once where they are to remain, and they will call for no farther trouble than keeping them clean from weeds, and to cut down the decayed stalks annually in autumn.

CORIANDRUM, Coriander.

It consists of herbaceous annual herbs of the culinary and medical tribe, and their leaves are the useful parts for the kitchen, and the seeds for medicine, also for distilling and confectionary.

Class and order, *Pentandria Digynia.*

Characters.] CALYX, umbellate flowers, having a general involucre, scarce monophyllous, and the partial one of three leaves, and a small five-parted calyx to each floret. COROLLA, a difform, radiated, general umbel, and the florets composed of five heart-shaped, inflexed petals. STAMINA, five filaments, and roundish antheræ. PISTILLUM, a germen under each floret, two styles, and radiated stigmas. PERICARPIUM, none; a spherical two-parted fruit, and two hemispherical seeds.

There are but two species, both of which have pinnate, divided, small leaves, somewhat resembling parsley; but there is but one species generally cultivated.

The species are,

1. *CORIANDRUM sativum.*

Cultivated Coriander.] Coriandrum with a small, fibry, white root, crowned by doubly-pinnate, many-parted leaves, having broadish segments; and in the centre rises an upright, round, branchy stalk, two feet high, having all the branches terminated by umbels of flowers, succeeded by globular fruit.

2. *CORIANDRUM testiculatum.*

Testiculated Smaller Coriander.] Coriandrum with smaller, many-parted leaves, and upright, angular, slender, branchy stalks, terminated by umbels of flowers, succeeded by testiculated or twin fruit.

The first species is that commonly cultivated, which, as a garden-herb, is sometimes used both for culinary uses in soups, &c. likewise the seeds for the same occasion; and the young leaves also, to use as an ingredient in sallads; but as the leaves are of a fetid smell, it is in no great esteem in England, except in some foreign families.

It is propagated by seed, which for garden use may be sown any time in spring or summer, sowing it in shallow drills half an inch deep, and let the drills be six inches asunder, observing, as the plants soon fly up to seed, a repetition of five or six sowings is requisite from March till September; and the last sowing should be on a warm border, or in a bed to be defended in winter with a frame, &c. whereby to obtain young green leaves more effectually during that season, or according as they may be required.

But the seeds of these plants being also in some considerable request by the confectioners, distillers, and druggists, but more abundantly the distillers, they are in some places cultivated in fields, in great quantities, for their production of seed for the supply of the above, to use in their respective trades.

When this plant is to be cultivated for its seed,

seed, it should be sown in March, either in drills a foot asunder, or by broad-cast, and rake it in; and when the plants are an inch or two high, hoe them to six or eight inches distance. They will shoot up into stalks the same year, early in summer, and produce abundance of ripe seed in August; when should be careful to pull or cut the seed-stalks in proper time: for, as the seeds are very slightly attached, if particular care is not observed, both in gathering soon enough, and cutting the stalks, great part would fall to the ground and be lost; therefore, as soon as the seed is ripe, should cut the stalks with care, and directly put them into cloths, &c. and thresh out the seed as soon as convenient.

CORIARIA, the Tanner's, or Myrtle-leaved Sumach.

It is a hardy, deciduous, small-leaved, flowering shrub for the shrubbery, adorned with spikes of quinquepetalous flowers.

Class and order, *Diœcia Decandria*.

Characters.] **CALYX**, male and female flowers on distinct plants, having small five-leaved cups. **COROLLA**, five oval petals. **STAMINA**, ten filaments, and oblong antheræ. **PISTILLUM**, five germina; five styles, and simple stigmas. **PERICARPIUM**, none; the petals become fleshy, angular, and berried, inclosing five seeds.

The species is,

CORIARIA *Myrtifolia*.

Myrtle-leaved Coriaria.] **Coriaria** with a shrubby, pithy, brown stem, closely branching from the bottom, and forms a bushy head three or four feet, thickly garnished with ovate-oblong, pointed, smallish, bright-green leaves, in pairs opposite; and at the sides and ends of the branches, small spikes of whitish flowers.

Varieties.] Male-flowered **Coriaria**—Female **Coriaria**.

This is a proper shrub for any of the common shrubbery compartments, to increase the variety, where its roots will creep considerably, and send up sprouts, or many small suckers, for increase.

It is easily propagated by suckers from the root, which it affords plentifully, and may be taken off with fibres every autumn or winter.

Layers in autumn will also be rooted in a year.

This plant derives the name, **Coriaria**, from its use in tanning of leather in the countries of its native growth, France, Spain, and Italy, &c.

CORNUS, Cornel-tree, or Cornelian-Cherry, and Dog-wood.

This genus consists principally of hardy deciduous trees and shrubs, proper for the

shrubby plantations, adorned with oblong leaves, and umbellate white flowers.

Class and order, *Tetrandria Monogynia*.

Characters.] **CALYX**, umbellate flowers, included in a four-leaved coloured involucre, the florets having a very small four-parted cup. **COROLLA**, each floret composed of four oblong acute petals. **STAMINA**, four erect filaments, and roundish incumbent antheræ. **PISTILLUM**, a roundish germen under the receptacle, filiform style, and blunt stigma. **PERICARPIUM**, a roundish berry, including a bilocular nut, having two kernels.

There are for our purpose five principal species of the tree and shrub kind, one of which species grows wild in England; the rest are of American growth, but all hardy enough to succeed here in the full ground.

The species are,

1. **CORNUS** *mascula*.

Male Cornus, or Cornelian Cherry-tree.]

Cornus with an upright tree-stem, rising twenty feet high, branching, and forming a large head, garnished with oblong-lanceolate leaves, and small umbels of yellowish-green flowers at the sides and ends of the branches, appearing early in spring, succeeded by small, red, cherry-like, eatable, acid fruit.

This species is esteemed both as a flowering shrub, and for its fruit, to preserve for making tarts.

The wood of this tree being extremely hard, derives the name *Cornus*, i. e. of a horn-like hardness and duration, and is said to last as long as iron.

2. **CORNUS** *sanguinea*.

Bloody-twigg, or Common Dog-wood.]

Cornus with an upright tree-stem, branching ten or twelve feet high, having blood-red shoots, garnished with ovate-oblong, pointed, nervous leaves, two inches long; and all the branches terminated by umbellate white flowers, succeeded by black berries.

Variety.] With variegated leaves.

This species grows wild in the hedges in many parts of this kingdom, but is cultivated in the nurseries, and may, with propriety, be introduced in large shrubberies, both for the variety of its foliage and flowers, as well as for the singular appearance of its red shoots in winter, when devoid of leaves.

3. **CORNUS** *florida*.

Great-flowered Cornus, or Virginia Dog-

wood.] **Cornus** with a tree-stem, branching twelve or fifteen feet high, and fine red shoots, garnished with large oblong leaves; and the branches terminated by umbellate white flowers, having a very large involucre, the leaflets obcordate, succeeded by dark-red berries.

Varieties.]

Varieties.] Virginia Dog-wood with a red involucre—Female Narrow-leaved Virginia Dog-wood with spear-shaped, acute, nervous leaves; and the branches terminated by umbellate white flowers, succeeded by red berries.

4. CORNUS *sericea*.

Silky-leaved Cornus, or Blue-berried American Dog-wood.] Cornus with an upright stem, branching eight or nine feet high, having beautiful red shoots; large oval leaves, hoary and whitish underneath; and all the branches terminated by umbels of white flowers, succeeded by bunches of large, oval, blue berries.

This species is remarkably ornamental both in its fine, large, whitish foliage and flowers in summer, and its numerous bunches of elegant blue berries in autumn.

5. CORNUS *alba*.

White-berried Pennsylvanian Dog-wood.] Cornus with an upright stem, branching eight or ten feet high, and very red shoots; oblong-oval leaves, whitish underneath; and large umbels of white flowers, succeeded by white berries.

Variety.] White-leaved American Dog-wood with spear-shaped, acute, smooth leaves; and large umbels of white flowers, and red berries.

Most of these species are strong shooters, well clad with leaves, from two to four inches long, of a lightish colour.

All these trees are elegant furniture for large shrubberies, wilderness-works, and all other ornamental plantations, where they will effect a fine variety with their leaves and numerous flowery umbels in summer, their clusters of berries in autumn, and those of the Dog-wood kinds, with their beautiful red shoots in winter, when the leaves are fallen.

They all prosper in any common soil and exposure; and as to their culture, permit them to assume their own natural growth, except just retrenching any rambling shoots, and clear away suckers from the roots, and all dead wood from the branches.

Propagation of all the Sorts.

Their propagation is by seed, layers, and cuttings, all in the full ground.

By seeds.—The seed of the American kinds generally arrive from thence in spring, which should be sown as soon as possible in a bed of good earth half an inch deep; but they rarely germinate till spring following, unless they are sown in autumn; therefore the seeds of the Cornelian-cherry, and Common Dog-wood, as also those of all the others that ripen here, should be sown in October, and they will, for the general part, grow the succeeding spring; and when the plants are a year old, plant them

out in nursery-rows; and when from two to four or five feet high, are of due size for the shrubbery, &c.

By layers.—Let the shoots of the year be layed in autumn; they will all be well rooted, and fit to transplant the autumn following.

By cuttings.—This may be performed in October or November: chusing strong shoots of the year, cut ten or twelve inches long, plant them three parts in the ground, and they will be well rooted by autumn following.

Suckers from the roots will also make good plants.

When these shrubs are from two to four or five feet high, they are fit for the shrubbery.

CORNUTIA (*Cornutia*),

Consists of a branching shrub for the stove, garnished with hoary leaves and ringent flowers.

Class and order, *Didynamia Angiospermia*.

Characters.] CALYX, a small, roundish, one-leaved cup, with the border dentated. COROLLA, monopetalous and ringent; the tube cylindric, and much longer than the cup; the limb is quadrifid, with the upper part roundish and erect, and the lower entire. STAMINA, four filaments, two of which rise above the tube of the corolla, and topped with simple inclining antheræ. PISTILLUM, a roundish germen, a bipartite, very long style, crowned with thick stigmata. PERICARPUM, a globose berry, sitting on the cup, containing a kidney-shaped seed.

Of this genus there is but one species,

CORNUTIA *pyramidata*.

Pyramidal-spiked Cornutia.] This plant rises to the height of ten or twelve feet, with irregular branches; garnished with hoary leaves, placed opposite; the flowers are of a fine blue colour, and come out in pyramidal spikes at the ends of the branches in autumn, and continue long in bloom.

The propagation is by seeds or cuttings.

By seeds—sown in the spring; and, when the plants are come up, transplanted into single pots, and plunged in the bark-bed in the stove, there to remain.

By cuttings.—These should be planted in pots, and treated in the same manner as the seedlings.

COROLLA, Corolla, or Little Crown, the botanic name for the flower-leaves, i. e. the beautiful coloured leaves of the flower, which immediately surround and defend the organs of generation, and stand within the calyx, where there is any.

This conspicuous and beautiful part of plants, the Corolla, is designed not only as an ornament to the respective plants, but also

to defend and nourish the tender generative organs, till they have performed their fecundating function, &c. and is therefore by Linnæus, in assimilating the animal and vegetable kingdoms, distinguished by the name of *aulæum floris*, or the palace in which the nuptials of the plant are celebrated.

The Corolla may be said to consist of two parts, the petals, and the nectarium; the last of which, however, is rather a striking superfluity, or occasional appendage in some, than a necessary part of every flower (see NECTARIUM); so that the petals are always to be considered as the principal part of the Corolla.

A Corolla of one petal is termed *monopetalous*; of two, *dipetalous*; of three, *tripetalous*; of four, *tetrapetalous*; of five, *pentapetalous*, or *quinquepetalous*; of six, *hexapetalous*, or *sempetalous*; of eight, *octapetalous*; of many, *polypetalous*; though all flowers, having more than one petal, are species of *polypetalous*.

Observe, in respect to number, that, in the characteristic description of the Corolla, the number of petals is always to be determined from their single or common state, never from the doubles, which are only accidental varieties; as, for example, in the *cheiranthus*, or wall-flower and stock-gilliflowers, in their common state, the Corolla consists only of four petals, but in the doubles they are numerous; and so of all other flowers that are apt to run into doubles, which are properly enough styled luxuriant flowers. See LUXURIANS *Flos*, and PLENUS *Flos*.

The real number of petals in the Corolla is determined from the base; that is, when the Corolla appears of two, three, or many parts or divisions, continued to or very near the bottom, it is considered as so many distinct petals, notwithstanding the base of the several petals may connect, as is the case of the mallow tribe, the genus *Narcissus*, and many others; but when the limb, or upper spreading part of the Corolla, is divided only about half way, or a little more or less, into several parts, it is considered only as one petal, *monopetalous*, divided into so many segments or parts.

Segments or divisions are very frequent in monopetalous flowers, which very commonly have their limb divided into five parts; in polypetalous flowers these divisions of the real petals seldom prevail.

In respect to the figure of the Corolla and petals,—in monopetalous flowers, there being but one petal, it is either bell-shaped, funnel shaped, salver-shaped, wheel-shaped, ruffled, or masque-shaped, as explained be-

low; and in a polypetalous flower, the Corolla is either regular, by having all its petals of equal figure, magnitude, proportion, and position, as in tulip, *Narcissus*, lily, &c. or irregular, by the petals assuming different figures, sizes, and positions, in the same Corolla, as in *aconitum*, or monk's hood, balmine, columbine, and lark-spur, &c.

In a monopetalous Corolla, the lower hollow part is called the tube, the upper spreading part the limb, the opening of the tube the chaps or jaws, *faux*. See TUBUS, LIMBUS, and FAUX.

In a polypetalous Corolla, the lower part is termed the claw, *unguis*; the upper spreading part, *lamina*. See UNGUIS and LAMINA.

The Corolla has different terms, according to the figure it assumes, as follow.

Corolla Campanulata, a bell-shaped Corolla, consists of one petal, regular and hollow like a bell, as in the genus *campanula*, convolvulus, and deadly night-shade.

Corolla Infundibuliformis, a funnel-shaped Corolla, consists of one regular petal, with a conic-shaped limb, standing upon a long tube, as in *datura*, or thorn-apple, oleander, tobacco, and marvel of Peru.

Corolla Hypocrateriformis, a salver-shaped Corolla, has one regular petal, having a plane or flat-spreading limb standing on a very short tube, as in periwinkle, &c.

Corolla Rotata, a wheel-shaped Corolla, has one regular petal, having a plane or flat limb without any tube, sometimes entire, and sometimes divided, as in *borago*.

Corolla Ringens, a gaping or grinning Corolla, has one irregular petal, shaped sometimes like a masque or snout of an animal with two lips, as in snap-dragon, or calf's snout; sometimes is terminated behind by a nectarium, in form of a tube, or spur of a fowl, as obtains in *Antirrhinum linaria*, or toad-flax. See RINGENS *Flos*, and PERSONATUS *Flos*.

Corolla Labiata, a labiated or lip Corolla, having unequal divisions formed into two lips, is a species of *Corolla Ringens*. See LABIATUS *Flos*, and VERTICILLATE.

Corolla Cruciformis, a cruciform, or cross-shaped Corolla, composed of four equal petals, that spread at top on their claws in form of a cross, exemplified in stock-gilliflower, lady's-smock, and the other numerous flowers of the class *tetradynamia*.

Corolla Papilionacea, a papilionaceous or butterfly-shaped Corolla, composed of four or five irregular petals, which, from their figure and position, bear an obvious resemblance to a butterfly with its wings expanded, exemplified

DIFFERENT COROLLÆ.

Campanulate



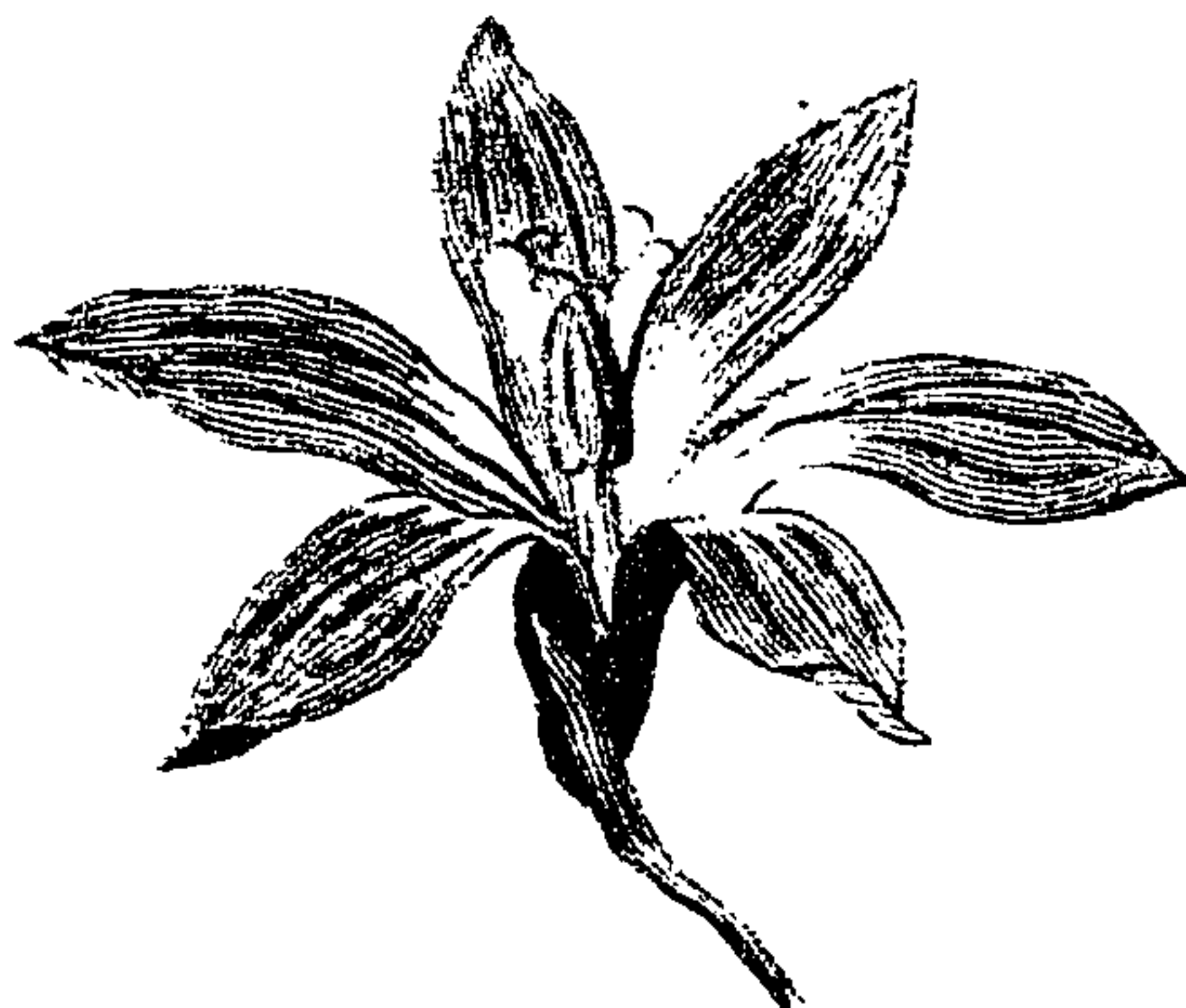
Infundibuliform



Hypocrateriform



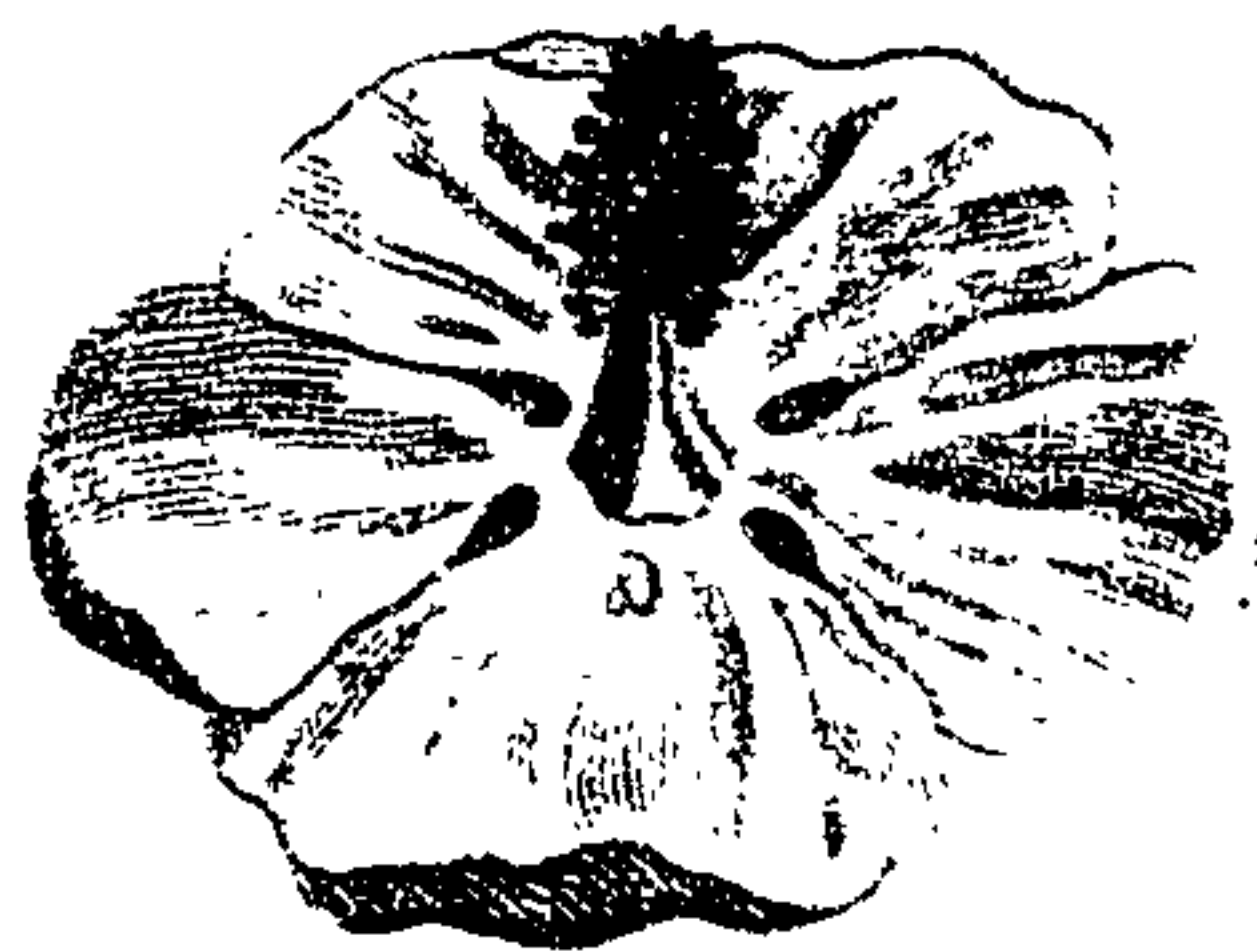
Tubulose



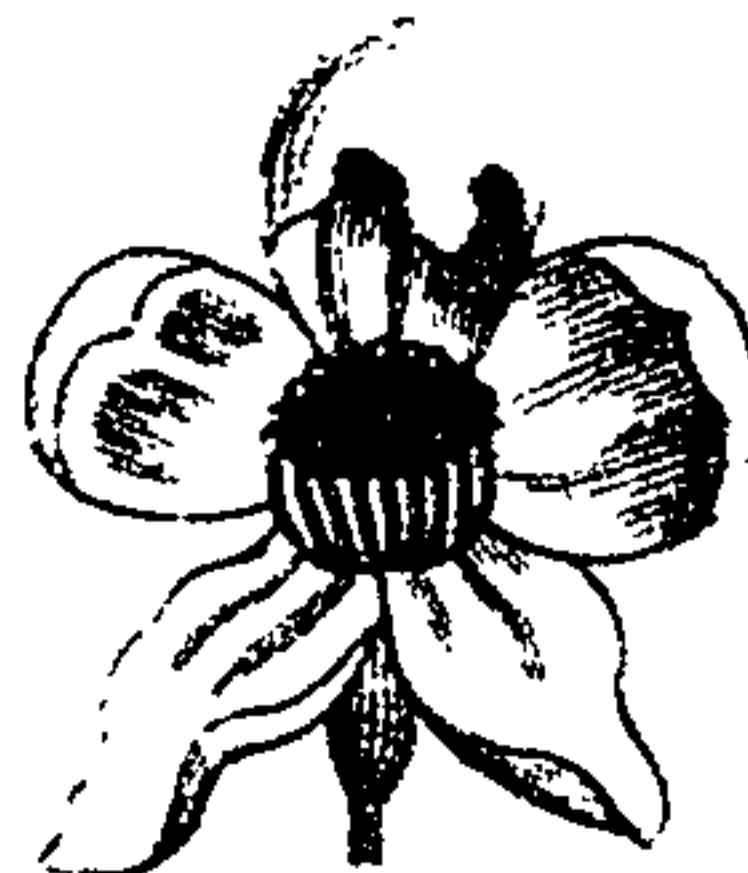
Labiata



Rotate



Ringent



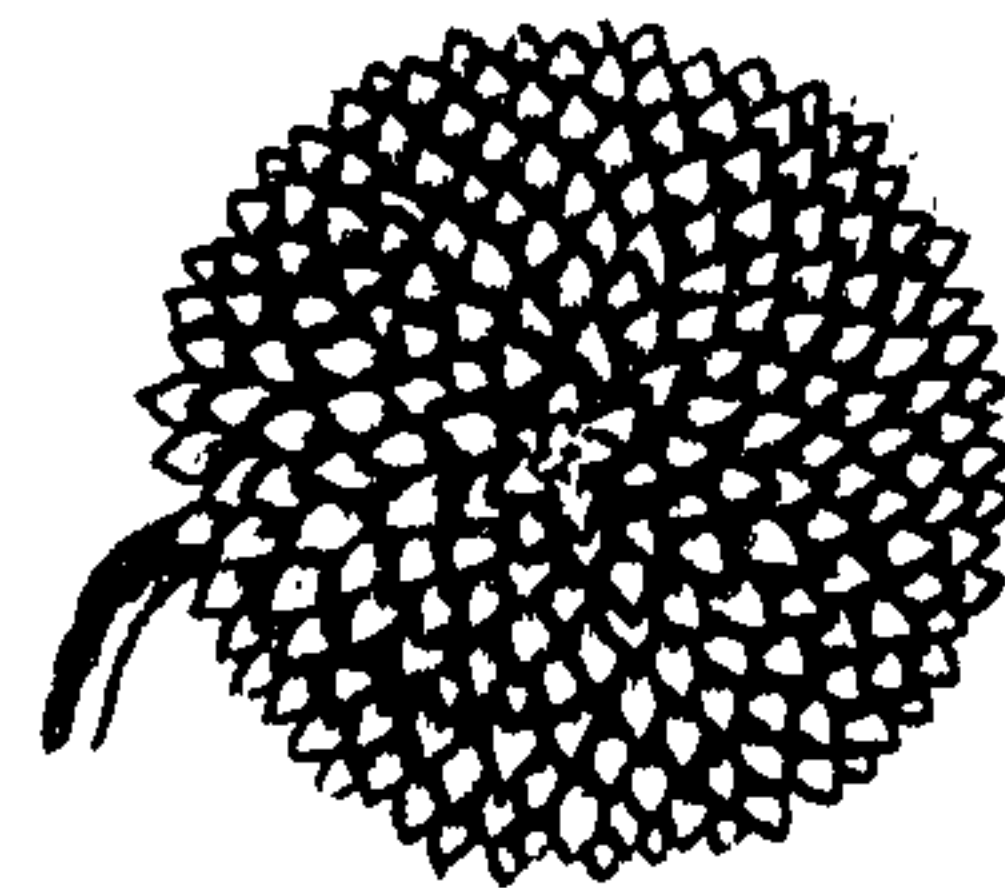
Labiata



Radiate Compound



Ligulate Compound



Cruciform



Papilionaceous



Regular Polypetalous



Irregular Polypetalous



plified in the pea, bean, kidney-bean, and laburnum, &c. The petals are characterised by distinct names; the upper one is called the standard, *vexillum*; the two side ones, the wings, *alæ*; and the lowermost one, sometimes concave and divided, is called the keel, *carina*, from its resemblance to the bottom or keel of a boat; is sometimes of one petal, and sometimes two united. See PAPI-
LIONACEUS *Flos*.

Most of the plants in the class *diadelphia* have papilionaceous flowers.

Corolla Regularis Polypetala, a regular polypetalous Corolla, having two, three, or many regular petals, of equal shape, magnitude, and position, as in rose-campion, hollyhock, tulip, lily, &c.

Corolla Irregularis Polypetala, an irregular polypetalous Corolla, consists of several irregular, dissimilar petals, generally accompanied with a nectarium, as in *aconitum*, balsamine, lark-spur, *orchis*, or bee-flower, *cypripedium*, or lady's-slipper; and most of the papilionaceous flowers come also under this denomination. See IRREGULARIS *Flos*.

With respect to the duration of the Corolla, the petals sometimes fall off immediately after their expansion, or endure but a few hours, or sometimes but one day; sometimes they are of several days' or even weeks' duration; and sometimes the Corolla withers on the plant without dropping at all, as often obtains in the cucumber, in which the flower sometimes remains on the end of the fruit, till fit to gather; but in most plants the Corolla falls off with the stamina and other parts soon after the fecundating function is effected; to assist which, by defending the generative organs, is apparently the main design of the Corolla.

CORONILLA, Jointed-podded Colutea, and *Emerus*, or Scorpion-Sena.

Of this genus there are some shrubby evergreens and deciduous shrubs, proper for the green-house and shrubbery collections, ornamented principally with pinnated, many-lobed leaves, and clusters of papilionaceous yellow flowers, succeeded by long, jointed seed-pods.

Class and order, *Diadelphia Decandria*.

Characters.] CALYX is monophyllous, compressed, erect, and bifid. COROLLA is papilionaceous; the vexillum heart-shaped, and the sides reflexed; the wings oval, and join at top; and the carina short, compressed, and pointed. STAMINA, ten filaments, nine of them united, the other stands separate, and small antheræ. PISTILLUM, an oblong, columnar germen, bristly style, and obtuse stigma. PERICARPUM, a long, round, jointed pod, having many seeds.

The principal species are as follow: the first four are low, rather tender shrubs, and are commonly retained in pots for shelter of a green-house in winter.

1. CORONILLA *glauca*.

Sea-green-leaved Coronilla.] Coronilla with a shrubby stalk, branching two feet high; pinnated evergreen leaves, of about five pair of glaucous-coloured lobes, terminated by an odd one; and, from the sides of the branches, many roundish bunches of bright-yellow odoriferous flowers.

2. CORONILLA *argentea*.

Silvery-leaved Cretan Coronilla.] Coronilla with a shrubby stalk, branching two feet high; pinnated leaves of nine or eleven silvery lobes; and roundish bunches of yellow flowers.

3. CORONILLA *valentina*.

Valentian Nine-lobed Coronilla.] Coronilla with a shrubby stalk, branching a foot or eighteen inches high; pinnated leaves of about nine pair of small lobes; and the branches terminated by bunches of yellow flowers.

4. CORONILLA *Juncea*.

Rushy-like, Spanish Coronilla.] Coronilla with a shrubby stalk, branching two feet high, the branches very slender like broom; garnished with leaves of five and three very narrow, linear, spear-shaped, fleshy lobes, and small bunches of bright-yellow flowers.

The following is a hardy, large, very beautiful, deciduous, flowering shrub, and remarkably floriferous.

5. CORONILLA *Emerus*.

(*Emerus*)—or *Scorpion-Sena*.] Coronilla with a shrubby stem, branching numerous six or eight feet high, closely garnished with winged leaves of three pair of lobes, terminated by an odd one; and at the sides of the branches, numerous long flower-stalks, each supporting two or three large yellow flowers, succeeded by longish pods.

Variety.] Dwarf Scorpion-Sena.

The flowers of all these shrubs are of the papilionaceous or butterfly kind, being composed of a standard, two wings, and a *carina*, or keel (see the *Characters*), appearing commonly in May and June in great plenty; and the *Emerus*, or Scorpion-Sena, appears covered with them, continuing long in beauty; and all the sorts are succeeded by jointed pods in autumn, filled with many seeds.

The first four species are rather tender, and, although they will live in open air in mild winters, they are impatient of severe weather; they should therefore, for the general part, be potted, to be moved to shelter of a green-house or glass-frame in winter;

and others may be placed in a sheltered situation in the full ground, to take their chance.

The fifth sort, *Scorpion-Sena*, and variety, are hardy and elegant flowering shrubs for the principal shrubbery compartments in gardens of any extent, and there are but few hardy shrubs that make a finer appearance.

Propagation of the Sorts.

The first four species are propagated by seeds in spring, either on a warm border, or in a slender hot bed; but the latter will forward them greatly: sow the seeds in pots of rich earth half an inch deep, and plunge them in the hot-bed; and when the plants are two or three inches high, prick them in separate small pots, allowing shade, water, and air, and harden them gradually to the full air in June, in which let them remain till October, then removed to shelter of a frame during winter; but cover them only in time of frost.

The *Scorpion-Sena* may be increased plentifully both by seeds, and by layers and cuttings.

Sow the seeds in March, in a bed of light earth, and cover them half an inch deep, giving occasional waterings in dry weather, and the plants will rise in a month or six weeks; and when they have had a year or two's growth, transplant them from the seed-bed in nursery rows, and in two or three years after, they will be large enough for the shrubbery.

By layers.—It may be done in autumn or winter, chusing the one year's shoots, giving them a gentle twist, and they will be rooted by the winter following.

By cuttings.—Plant some of the young shoots in spring, or in October or November, in a shady border, giving water the following spring and summer, and many of them will be rooted by autumn.

CORTUSA, Bear's-ear Sanicle.

It furnishes two very low, herbaceous, flowery perennials, crowned by umbels of monopetalous, wheel-shaped, auricula-like flowers, having five stamina and one style.

The species are,

1. *CORTUSA Matthioli.*

Bear's-ear Sanicle of Matthioli.] Cortusa with a fibry root, crowned by many oblong, heart-shaped, indented leaves in a cluster, and among them round flower-stalks six inches high, terminated by umbels of fine red flowers longer than the calyx.

2. *CORTUSA Gmelini.*

Bear's-ear Sanicle of Gmelin.] Cortusa with a fibry root crowned by a tuft of heart-shaped leaves, and flower-stalks four inches high, terminated by umbels of pale-red flowers shorter than the calyx.

They are natives of mountainous, rocky parts abroad, so must have a dry, lean soil; or may be kept in pots of dry, sandy earth, placed in the shade, and in summer must be duly watered; and their propagation here is by slipping the roots in October.

CORYLUS, the Hazel or Nut-tree, Filbert, &c.

This genus furnishes three species only, mostly of the large shrub or moderate tree kind, hardy and deciduous, and of which there are several varieties, valuable in gardens for their fruit, as also by way of variety in large shrubbery and other ornamental plantations.

Class and order, *Monæcia Polyandria.*

Characters.] CALYX, male and female flowers, remote on the same plant; MALES are collected in a long catkin, or scaly amentum, each scale forming a calyx. COROLLA, none. STAMINA, many very short filaments in each scale, and oblong, erect antheræ; FEMALE FLOWERS in a very small subglobular amentum, included within the advancing bud sitting close to the branches, having a thick, two-leaved, leathery calyx, enlarging to the length of the fruit, and lacerated at the margin. PISTILLUM, a roundish germen, two styles, and simple stigmas. PERICARPIUM, none; the germen becomes an oval nut, pointed at the top.

Botanists admit of but three real species of *Corylus*, and that the Hazel, Filbert, Cobnut, &c. are all varieties of the same species, and that the common Hazel or Nut-tree of the woods is the original species.

The species are,

1. *CORYLUS Avellana.*

Common Hazel or Nut-tree.] *Corylus* with an upright tree-stem, very branchy, and forming a full head from ten to twenty feet high, garnished with large, roundish-cordate, pointed leaves, having oval stipulæ; and male flowers, growing in long, yellowish catkins, and female flowers sitting close to the branches, appearing in spring, of a red colour, succeeded by the fruit in large cups, ripening in autumn.

Varieties.] Common Wood-nut with a white-skinned kernel—Red Wood-nut, having a red-skinned kernel.

Large Cluster Wood-nut—The Nuts grow in large clusters, and are also large and fine, and the trees very proper for garden or orchard culture.

Great Cob-nut—A remarkable large round Nut with a thick and very hard shell, more valuable for its size for variety, than any particular excellency in its kernel.

Long-nut—is an inch and half, or two inches

inches long; broadish and rounded at the top, but does not kernel well.

Barcelona, or Spanish-nut—A large, roundish, thin-shelled Nut, always remarkably well-kernelled, which is exceeding sweet and good, and will ripen in England, so is a very proper sort for culture; and the tree is a strong shooter.

Filbert-Nut-tree—The branches grow more erect, and the *stipulae* more oblong than the other kinds, and the fruit is oblong, large, thin-shelled, and well filled with exceeding sweet kernels, and the Nuts frequently grow in clusters. Of this there are two notable varieties—White-skinned Filbert—Red-skinned Filbert.—The Red sort is in most esteem, being coveted for the beauty of its red kernel. The trees of these two varieties are very distinguishable; those of the White sort have the shoots and leaves of a light-green colour, and those of the Red kind are of a dark or reddish-green. Both the varieties are good bearers, and will succeed almost any where; they are therefore well worth culture in every garden or orchard.

2. *CORYLUS rostrata.*

(*Rostrated-Calyxed Corylus*)—or *American Cuckold-Nut.*] *Corylus* with an upright stem dividing into a branchy head; oblong-heart-form, acute leaves, having lanceolate *stipulae*, and Nuts in very long cups, covering the fruit, rostrated or beaked.

3. *CORYLUS Colurna.*

(*Colurna*)—or *Dwarf Byzantine Nut-tree.*] *Corylus* with an upright, shrubby stem, branching four or five feet high; roundish, pointed leaves, and narrow, acute *stipulae*; and large round Nuts growing in clusters.

The flowers of all these trees are male and female, at a distance on the same tree; the males appear in long scaly amentums, formed in autumn and winter, and the females, or fruitful flowers, come out in spring, in clusters close to the branches, having thick, two-leaved, torn cups, appearing of a reddish colour, and the calyx incloses the fruit, and accompanies it to maturity, generally one Nut in each cup.

All the sorts of *Corylus* are very hardy, and will prosper in almost any situation and soil, high or low, or on the sides of hills, as is evident from the common Hazel growing wild in such abundance in woods, wilds, forests, and field hedges, in almost every county of the kingdom, and from which the Nuts are collected that supply the different markets; the trees also turn out to good account when growing in coppices, to cut as underwood, and for poles for various uses, as hoops, spars,

hurdles, handles to husbandry implements, walking sticks, fishing-rods, and many other uses, and for which purposes they will afford a falling every fifth, seventh, or eighth year, according to the uses for which they are designed.

For purposes in gardening, several of the varieties are worthy of culture, for the sake of their fruit; particularly the Cluster-nut, Large Cob-nut, Barcelona-nut, and the two varieties of Filberts; all of which may either be trained as full standards, half standards, or dwarfs. When required for standards, they should be planted at fifteen feet distance, either in the garden, or on the edge of orchards, &c. or they may be dropped singly in different parts, to form the greater variety; and in pleasure-grounds, some may be disposed by the sides of shady walks, or shrubbery compartments, and other plantations contiguous to the walks, some as dwarfs, others as half and full-standards, where they will exhibit variety as common shrubs, and the progress of the fruit will afford entertainment in excursions through the plantation, as well as furnish a supply for the dessert.

Observe, when you design them to form full standards, you should train them with a single stem five or six feet high, at which height suffer them to branch out and form a head, according to their natural growth; but for half standards, a three or four feet stem is sufficient; and for dwarfs, train them with a single stem to a foot and half or two feet in height, then top them, and they will branch out, and form a low spreading head.

All the culture these trees require, after being planted as fruit trees where they are to remain, is to clear the bottom annually from suckers arising from the root, and the stem from all side shoots; and as to their heads, let them, for the general part, take their natural growth, except just retrenching any very rambling shoots or branches.

But sometimes, intended as fruit trees, they are planted to form a kind of hedge, setting them five feet distance; so leave them mostly to nature, to shoot from the bottom, sides, and top, in their own way; but these do not generally produce so large, fine fruit, as trees with one stem, standing at such distances, that their heads have full scope to spread regularly every way.

When a full plantation of these trees is designed for their fruit, I should advise planting them in rows not less than fifteen or twenty feet distance, nor less than ten or fifteen feet asunder in the lines.

But of the different species and varieties of
8 *Corylus.*

Corylus, the two sorts of Filberts are the most estimable and valuable kind as fruit trees of this kind for general culture, in gardens or orchards, &c. either for the supply of a family, or in large plantations, to produce considerable quantities of Nuts for the markets; the Nuts being both larger, and of superior flavour, and the trees generally great bearers; so that they deserve culture more abundantly than most of the other sorts; and they will prosper in any common soil and situation, in gardens, orchards, fields, &c. planted both as standards in rows fifteen or twenty feet distance by twelve feet in the lines, and trained to single stems four to five or six feet, and with branching, full spreading heads; or are sometimes planted hedge-fashion in gardens, both in single rows to run up in natural growth, and occasionally in a double row, ten or twelve feet between, to form a shady filbert walk; and in all of which they will bear abundantly; but the detached single standards commonly produce the largest fruit.

The trees of these sorts are very profitable to plant in some considerable quantity to afford large productions of Nuts for the markets, as above observed, in which they generally have a ready sale.

However, it would be eligible to plant some of each of the other principal sorts of Nut trees, in gardens, pleasure-grounds, orchards, &c. where there is sufficient space for their admission: they will form an agreeable variety in their different fruits, both in their growth, and when served up to the table.

When designed to form a coppice of common Nut-trees, for poles, &c. it may be effected either by sowing the Nuts in drills in autumn or spring in the places where the trees are always to remain, in rows the distance as below; or they may be previously raised from the Nut in the nursery way; and, when two or three to four or five feet high, plant them out where they are to remain, in rows five feet distance, and a yard in the rows, and they will be fit for the first fall, in a thinning order, in eight, ten, or twelve years, according to the uses they are designed for, and every fifth, sixth, or seventh year afterwards.

Propagation of all the Varieties.

All the sorts of *Corylus* may be propagated with facility by planting the Nuts, by layers, suckers from the root, and by grafting and budding.

By planting the Nuts.—This should be done in spring: but until the arrival of that season, it is proper to preserve the Nuts in sand, in some airy room, shed, or cellar; and in February plant them in drills near two inches

deep, and the plants will appear in six or eight weeks, which, when a year old, plant out in nursery-rows, and there train them two or three years, for the purposes wanted, i. e. either as standards, half standards, or dwarfs; then transplant them into the garden, &c. It is to be observed, that in raising these trees from the Nut, the sorts are not to be always depended on; for, like most other seedling fruit-trees, they often vary, so that the most certain method to continue the respective sorts is by layers, &c. observing, however, that in raising from Nuts, sometimes trees are obtained, which produce Nuts as good, and sometimes better than those from which they were raised.

By layers.—This is one of the most certain methods of continuing the respective varieties distinct; for layers of the Cluster-nut never fail to produce fruit exactly of the same kind and manner; the same of the Cobs, Barcelona, and Filberts; and this is a very easy and expeditious method of propagation, for every twig layed will readily grow; therefore, in autumn or winter, having recourse to some low-growing trees, let some of the lower branches, that are well furnished with young shoots, be pegged down in the ground, then lay all the young shoots thereof in the earth with their tops out, every one of which will root and advance in length, and be fit to transplant by autumn following, when they should be separated and planted in nursery-rows two feet asunder, and trained as observed of the seedlings: but when any considerable quantity are to be raised this way, it is eligible to form stools for that purpose, by previously, a year before, heading down some trees almost to the ground, to throw out a quantity of shoots near the earth convenient for laying, and they will furnish a supply for that use annually.

Suckers, arising from the roots of trees raised by either of the above methods, if taken up in autumn, winter, or spring, with good radical fibres, will also grow freely, form proper plants, and produce the same sort of fruit as their parent plant; and suckers of these may also be used for the same purpose; and in which method of propagation, the strong suckers may be planted at once where they are to remain; and the smaller sizes planted in a nursery for a year or two.

By grafting and budding.—These methods have also the same effect as layers, of continuing any particular variety with certainty; and the operation is to be performed in the usual way on stocks of any of the species and varieties of this genus. See GRAFTING, &c.

CORYMBUS, a mode of cluster-flowering,

ing, resembling the form of a cluster of ivy-berries, and differs from the umbel and racemus, and other modes of cluster-flowering. See UMBELLA and RACEMUS.

A Corymbus-cluster is distinguishable, in that many partial flower-stalks arise from different parts of the common stalk; and although of unequal lengths, by coming out higher or lower on the main stalk, yet they all rise to the same height, so as that the flowers they support form a flat and even surface at top, exemplified in *Spiræa opulifolia*, *Tanacetum*, &c. and differs from an umbel, in which all the partial flower-stalks proceed from one point or common centre, and rise also to an equal height. See UMBELLA.

A Corymbus is either simple or compound; simple, when the partial flower-stalks have no branches; compound, when they branch out into several ramifications, yet so as to form an even surface at top.

CORYPHA, Fan Palm.

It consists of one species, a perennial exotic with large, frondose, palmate, plaited leaves, and spathaceous flowers, a native of India, and retained here in our stoves for variety.

Class and order, *Hexandria Monogynia*.

Characters.] CALYX, a universal compound spathe protruding a branching spadix of many florets, each having a triphyllous cup. COROLLA, three-parted into ovate, obtuse, spreading petals. STAMINA, six awl-shaped filaments, with joined antheræ. PISTILLUM, a roundish germen, short, subulate style, and simple stigma. PERICARPIUM, a globose drupe of one cell, containing an osseous, round nut.

The species is,

CORYPHA minor.

Smaller Fan Palm.] Corypha with a spreading root sending up frondose foot-stalks, elevating, large, palmate-fan-shaped, plaited leaves, from eighteen inches to two feet long, and near eighteen inches broad, opening like a fan, with threads intervening: and between the leaves arises a spathe protruding a spadix of flowers, which are succeeded by drupaceous fruit.

This plant being a native of India requires the constant protection of the stove.

It is propagated by seeds and by slips from the head of the root; the seeds are procured from abroad, which sow in pots of light sandy earth, and plunge them in a hot-bed, giving occasional waterings; and by autumn or spring following the plants will be fit to be pricked into separate pots. By slips—The crown of the roots sometimes affords off-sets, which, if separated with fibres to them, planted in pots, and plunged in a hot-bed, will readily grow.

But some sorts of the *Corypha umbraculifera*, or Umbrelliferous Great Fan Palm, are described of a very stupendous growth in bulk and height in the East-Indies, their native country; as large and tall as a ship's mast, and perfectly straight; and the leaves pinnate-palmate, so large and broad that one will cover fifteen or twenty persons, like an umbrella; and when dried, are so limber and pliant as to admit of folding up in the manner of a fan in a small compass; they grow quite on the top of the tree, which is said to bear no fruit till the last year of its duration, then produces numerous beautiful yellow blossoms in great spreading branches, succeeded by vast quantities of fruit.

COTYLEDON, Navel-wort, (*Cotyledon*.)

The plants are succulent perennials, both of hardy nature, and for the green-house and stove, from half a foot to a yard and half high, adorned with roundish and oblong, thick, fleshy leaves, and monopetalous, bell-shaped, yellowish flowers, in spikes and umbels.

Class and order, *Decandria Pentagynia*.

Characters.] CALYX, monophyllous and five-parted at top. COROLLA is monopetalous, bell-shaped, and five-parted at the brim. STAMINA, ten erect filaments, and four-furrowed antheræ. PISTILLUM, five germina, and styles, and simple stigmas. PERICARPIUM, five oblong, ventricose, univalvular capsules, having many small seeds.

The species are,

1. COTYLEDON *Umbilicus*.

(*Umbilicus*)—*Umbilicated or Common Navel-wort.*] Cotyledon with round, target-shaped, hooded, ferrate-indented, fleshy leaves, directly from the root, on foot-stalks joined to the middle, and the upper surface umbilicated like a navel; and amidst them, branching, leafy flower-stalks, from half a foot to half a yard high, terminated by long spikes of erect, close-fitting flowers, of different colours in the varieties.

Varieties are] Umbilicated Cotyledon with yellow flowers—with reddish flowers—with whitish flowers—with streaked flowers—with creeping roots—with tuberous roots.

This species and varieties grow wild in many parts of Great-Britain, in rocky and gravelly places, old gravel-pits, upon old walls and buildings, ruins, &c. and in gardens may ornament artificial ruins, rock-work, and grottos, or any dry borders, banks, or other similar compartments.

It derives the name Navel-wort from the form of its umbilicated leaves.

The three following are shrubby, green-house exotics from Africa.

2. CORY-

2. *COTYLEDON orbiculata.*

Orbiculate-leaved Cotyledon.] Cotyledon with thick, succulent, ligneous, perennial stalks, emitting crooked, irregular branches, and grows from one foot to a yard or more high, ornamented with roundish, plane, fleshy, entire leaves, having purplish edges; and at the ends of the branches, umbellate clusters of pale yellow flowers.

Varieties.] With stems very branching and spreading—with upright stems—with round leaves—ovate-spatulate leaves—oblong-spatulate leaves.

3. *COTYLEDON hemisphaerica.*

Hemispherical-leaved Cotyledon.] Cotyledon with a thick, succulent, perennial stalk, very branchy, and but six or eight inches high, garnished with semi-globular, thick leaves, one side being convex, the other plane, having purplish edges; and at the top of the branches, several greenish-purple-tipped flowers.

Variety.] With spotted leaves.

4. *COTYLEDON spuria.*

Spurious, Long, Narrow-leaved Cotyledon.] Cotyledon with short, thick, succulent, ligneous, perennial stalks, branching irregularly; long, narrow, spatulate-shaped, fleshy, opposite, and alternate leaves; and yellow flowers, on long, fleshy foot-stalks at the ends of the branches.

The following is a stove plant from India and Ægypt.

5. *COTYLEDON laciniata.*

Cut-leaved Cotyledon] Cotyledon with an upright, jointed, succulent, perennial stalk, a foot high; broad, pinnatifid, thick, succulent, grayish, opposite leaves, of three or five segments; and from the ends of the branches, golden-yellow, quadrifid flowers.

The last four species are perennial in stalk and branches, are very succulent, and become ligneous or shrubby; the leaves are also succulent, commonly of a grayish colour, and remain the year round. The flowers are universally monopetalous, bell, or funnel-shaped, which in the last four sorts are produced on long, thick, fleshy foot-stalks, appearing at different times of the year; and only the first sort produce seeds in England.

For purposes in gardening, the *Cotyledon Umbilicus* may be introduced to adorn rock-work, ruins, &c. or will succeed in any dry, gravelly soil; and the second, third, and fourth sorts, exhibiting a curious singularity in their general habit, merit a place in the green-house collection; as likewise the fifth sort for the stove; observing, that these last four sorts, being very succulent, must always be retained

in pots of dry, sandy, or rubbishy compost, and managed as other succulents of the green-house and stove departments. See *SUCCULENT PLANTS*, &c.

Propagation.

The first sort may be raised from seed in any dry, gravelly soil, or scattered in the crevices of rock-work, grottos, walls, or old buildings, and covered with earth; the plants will come up, and afterwards propagate themselves.

All the other sorts are easily propagated by cuttings of their succulent branches any time from May till August; the cuttings may be from three to five or six inches long, which, previous to their planting, ought to lie a week or ten days to dry over the cut part; then plant them in pots of dry compost, as prepared for other succulents (see *COMPOST*); and then, as to the green-house sorts, place them either in the green-house, or a frame, to have shelter from wet, and occasional shade, though it would be of particular advantage to plunge all the sorts in a bark-bed or other hot-bed to forward their radication, giving occasional shade, and water once a week, and they will be rooted in a month or six weeks, when those of the green-house should be hardened to the full air for the remainder of the summer.

COTYLEDONES, Cotyledons, the side-lobes or covers of the seed, which become also the two first leaves of the plant (likewise called Cotyledons, or the seminal or seed-leaves), are generally smooth and fleshy, and most commonly two in number, as in cucumber, and most other plants, and are very different from the proper leaves that are afterwards produced.

The lobes accompany the plant for some time after its eruption from the earth, till having acquired sufficient strength to advance in its proper leaves, then the seminal leaves become useless, wrinkle, wither, and die away.

CRAMBE, Sea-Cabbage, or Sea-beach Kale, or Sea Colewort.

The plants are herbaceous esculents, consisting of perennial roots, producing annually large, cabbage-like leaves, spreading on the ground, and robust flower-stalks; and the young shoots of the plant, just issuing from the earth, are excellent eating, and two shrubby exotics for the green-house.

Class and order, *Tetradynamia Siliquosa*.

Characters.] *CALYX*, four oval, patent, deciduous leaves. *COROLLA*, four large, broad, spreading, cruciform petals. *STAMINA*, four long and two short filaments, two-parted at top, and single antheræ. *PIS-*

TILLUM,

TILLUM, an oblong germen, no style, but a thick stigma. **PERICARPIUM**, a roundish berry, containing one seed.

The species is,

CRAMBE maritima.

Sea-Cabbage.] Crambe with creeping, perennial, white roots, crowned by very broad, thick, smooth, gray-coloured, annual leaves, divided at the edges, and spreading near the ground; and between them a robust, very branchy flower-stalk, a foot and half high, having all the branches terminated by loose spikes of white flowers in June, succeeded by berry-like pods the size of large peas.

Varieties.] With deeply cut leaves—with yellowish flowers.

This plant and varieties grow wild on the sea shores in many of the maritime counties of England, but is now cultivated in many gardens, as a choice esculent; and the young robust shoots of its leaves and flower-stalks, just as they issue forth from the earth, in the manner of asparagus shoots, are then in the greatest perfection for use; at which period they appear white, as if blanched, which, when boiled, eat exceeding sweet and tender; and its principal season for use is April and May.

This plant may also be employed in the pleasure-ground as a flowering perennial; for the stalks divide into fine branchy heads of flowers, appearing very ornamental.

Propagation and Culture.

It is propagated by seeds sown in any common light earth in autumn or spring, in the place where the plants are to remain, which, when two years old, will produce shoots fit for use, and will multiply exceedingly by the roots, and continue many years.

To cultivate this plant as an esculent in the kitchen-garden, it should generally be raised in beds four feet and half wide, with two foot wide alleys between bed and bed, for the convenience of landing them up annually in autumn, that the shoots may be blanched a good length; and the lighter and more sandy or gravelly the soil, the better, though the plants will succeed tolerably in any common light soil of a garden. Having dug the ground, and prepared the beds the width as above, draw three shallow drills lengthways of each bed, and scatter the seeds therein thinly, covering them an inch deep; when the plants come up, thin the rows, leaving the strongest plants a foot asunder; keep them clean from weeds all summer; and in autumn, when the leaves decay, in October or November, clear them away close to the ground, then spread an inch or two depth of light earth from the alleys

over the beds; after this, nothing more is required till the following spring and summer, when the care of weeding is to be repeated; and in autumn earth the beds from the alleys as before, or with some sandy, or any light, dry, or gravelly soil brought in for that purpose; landing them now three or four inches deep; the spring following, in March, April, and May, the plants will probably produce shoots fit to cut for use, but not generally in proper perfection till the third year; observing, as the heads make their appearance through the earth, to open the soil a little, and cut the shoots four or five inches within the ground.

The same plantation continues many years, and the roots produce a fresh crop annually.

Their general culture is keeping them clean from weeds; and every autumn clear away all the large leaves, and land up the beds from the alleys two or three inches deep, to maintain a due depth of soil over the roots for the heads to shoot through, that they may be blanched at least four or five inches in length; and early in spring loosen the top of the beds with a fork, and rake them smooth.

It would be eligible sometimes in winter, to cover the beds also with some dry, rotted dung, both by way of manure, and to guard the roots better from severe weather, that in the whole they may shoot in a stronger, free growth; clearing off the gross part of the dung, and in spring, loosen the surface of the earth as above, and to which may sometimes apply a coat of light sandy or gravelly soil.

To cultivate this plant for ornament, sow the seed either where you design they shall remain, or in a bed, and transplant them in autumn.

The two following species are shrubby exotics for the green-house.

2. **CRAMBE fruticosa.**

Shrubby Sea Cabbage or Colewort.] Crambe with a stiff, shrubby stalk, ovate, pinnatifid, serrated, hoary leaves; and racemous, dichotomous panicles of white flowers, appearing great part of the year.

3. **CRAMBE strigosa.**

Strigose, Rough-leaved, Shrubby Sea Colewort.] Crambe with a rugged, upright, shrubby stem, branching five or six feet high; oblong-ovate leaves, unequal and two-eared at the base; strigose, and terminal, long, racemous panicles of erect flowers in May, June, and July.

These two shrubby species, being exotics from Madeira and the Canary islands, require the protection of a green-house in this country in winter; kept in pots of light earth; and

may be propagated by cuttings in spring or summer.

CRASSULA, *Crassula*, Lesser-Orpine, or Live-ever.

This genus furnishes succulent plants for the green-house and stove, from one foot to six or eight in height; ornamented with oblong, thick, succulent leaves, and funnel-shaped, pentapetalous flowers at the ends of the stalks and branches.

Class and order, *Pentandria Pentagynia*.

Characters.] **CALYX** is pentaphyllous and permanent. **COROLLA**, five long, narrow petals, connivent at the base, spreading and reflexed at the brim, and five scale-like nectariums at the bottom. **STAMINA**, five filaments, and simple antheræ. **PISTILLUM**, five oblong, acuminate germina, five styles, and obtuse stigmas. **PERICARPIUM**, five oblong, pointed capsules, and many small seeds.

The principal species in the English gardens are,

1. **CRASSULA coccinea**.

Scarlet Shrubby Crassula.] *Crassula* with a round, jointed, reddish, succulent, perennial stalk, dividing into a branchy head two or three feet high, ornamented with oblong, plane, cartilaginous-ciliated-edged, opposite leaves, their base surrounding the stalks like a sheath; and at the ends of the branches, close umbels of beautiful scarlet flowers.

2. **CRASSULA cultrata**.

Sharp-leaved, Shrubby Crassula.] *Crassula* with a slender, succulent stalk, branching irregularly about two feet high; obovate, sub-cultrate, oblique, thick leaves, connate, entire, and the branches terminated by large clusters of small greenish flowers.

3. **CRASSULA perfoliata**.

Perfoliate Shrubby Crassula.] *Crassula* with an upright, slender, succulent, perennial stalk, branching from three to six feet high; lanceolate-awl-shaped, thick, fleshy, close-fitting leaves, plane and canaliculated above, convex below, growing opposite, with their bases connate, and perforated by the stalk; and large clusters of white flowers at the top of the branches.

4. **CRASSULA punctata**.

Dotted-leaved Crassula.] *Crassula* with feeble, very jointy, divided, succulent stalks, eight or ten inches long; ovate, and oblong, succulent, opposite leaves, hollow-dotted, ciliated; and clusters of white flowers at the ends of the stalks.

5. **CRASSULA orbiculata**.

Orbicular-headed Crassula.] *Crassula* with a low, feeble, perennial stalk, crowned by thick

succulent leaves, collected into a round, imbricated, spreading head, proliferous in many short trailing stalks every way, terminated also by heads of leaves; and from the centre of all the heads, clusters of greenish flowers.

6. **CRASSULA nudicaulis**.

Naked-stalked Crassula.] *Crassula* with long, awl-shaped, succulent, perennial leaves, collected into a head at the crown of the root; and amidst them a naked annual flower-stalk, divided into branches half a foot high, surmounted by clusters of white flowers.

All these plants are very succulent both in stalk, branches, and leaves; both stalk and branches are perennial, frequently of a reddish colour, and the leaves are persistent; and the flowers appear principally in June, July, August, and sometimes in winter and spring.

These plants are all exotics, principally of *Æthiopia*, so require shelter of a green-house here in winter, and must therefore always be kept in pots.

They claim a place in our collections of succulent plants for variety; though, as to their flowers, those of the *Crassula coccinea* are considerably the most beautiful, and appear annually; but all the sorts having a singularity in their external habit, they are worthy of attention for the succulent collection; they must be potted in light, sandy compost, common for other succulents, and retained in a sunny part of the green-house all winter, and very sparingly watered; but in summer may place them in the full air in a sheltered place, and in dry weather water them twice a week.

Their propagation is--The first three or four sorts are with facility increased by cuttings of their stalks and branches, cut off from three to five or six inches long, in May, June, or July; and after lying in a dry place some days, to skin over the wounded part, plant them in pots of sandy earth, placing them in a frame, to be occasionally shaded from the sun, and sheltered from wet; they will be rooted in six weeks, though, where there is the convenience of a bark-bed to plunge them in, they will root sooner.

The other sorts may be propagated by off-sets of their heads, and plant them as above.

CRATÆGUS, Wild Service-tree, Hawthorn, &c.

The plants are of the tree and shrub kind, hardy, and of the deciduous tribe, valuable for economical and ornamental purposes in gardening, and of stature from five to fifty feet, adorned with simple leaves, in some divided,

vided, others entire, and clusters of pentapetalous white flowers in May and June, succeeded by bunches of red berries in autumn.

Class and order, *Icosandria Digynia*.

Characters.] CALYX is monophyllous, five-parted, patent, and permanent. COROLLA, five roundish, concave petals, inserted into the calyx. STAMINA, twenty or more filaments inserted into the calyx, and roundish antheræ. PISTILLUM, a germen under the corolla, two filiform, erect styles, and capitated stigmas. PERICARPIUM, a roundish, fleshy, umbilicated berry, containing two longish, hard seeds.

There are about six or eight species retained in the English gardens, some of which admit of several curious varieties.

The species are,

1. *CRATÆGUS Oxyacantha*.

(*Oxyacantha*)—or *Common Hawthorn*, or *Whitethorn*.] *Cratægus* with a robust trunk, branching from the bottom upward to ten or fifteen feet high, the branches armed with thorns; obtuse, trifid, sawed leaves; and numerous clusters of white flowers from the sides and ends of the branches, succeeded by bunches of dark red berries called Haws.

This is a most useful tree in forming our hedges, and it grows wild all over Europe.

Other varieties of this are,

Double-blossomed Hawthorn—grows like the *Common Hawthorn*, only the flowers double, large, and produced in large clusters all over the branches, of great fragrance and beauty.

Scarlet-berried Hawthorn—grows twelve or fifteen feet high; large leaves and flowers, and exceeding large bright-scarlet fruit.

Yellow-berried Virginia Hawthorn—grows ten or fifteen feet high, having its buds in spring yellow, and fruit of a golden yellow colour.

White-berried Hawthorn—A low-growing tree, producing small whitish fruit.

Maple-leaved Hawthorn—grows fifteen or twenty feet high; large whitish-green leaves, large bunches of flowers, and shining red fruit.

Glastonbury-Thorn—grows twelve or fifteen feet high, and is like the common Hawthorn in growth, leaves, flowers, &c. only with this difference, that it generally flowers in winter or very early in the spring, and has, by numerous persons, been long supposed to blow commonly on Christmas-Day; it however has no certain day, week, or month of flowering, but happens generally in January or February, sooner or later, according to the temperature of the season; the notion of this tree blossoming on Christmas-Day proceeds from the tradition of the original tree at Glas-

tonbury-Abbey, called the Holy-thorn, which was pretended to have been planted by Joseph of Arimathæa, and that it always flowered on that day; so is still known by the name Glastonbury Thorn, and retained by the same name in ornamental plantations for variety.

2. *CRATÆGUS Aria*.

(*Aria*)—*White-Beam*, or *White-leaf tree*.] *Cratægus* with an upright, large trunk, dividing upward into a branchy head, growing twenty or thirty feet high, having all the young branches spotted with a mealy down; oval, unequally-ferrated leaves, woolly and very white underneath; and large bunches of white flowers at the ends of the branches, succeeded by clusters of red berries.

The leaves are about three inches long, and half as broad.

3. *CRATÆGUS torminalis*.

(*Torminale-fruited*)—*Wild Service* or *Sorb*; or *Maple-leaved Wild Service-tree*.] *Cratægus* with an upright, large trunk, and very branchy spreading head, rising forty or fifty feet high; oblong, septangular leaves, hoary underneath, lowest lobes divaricated; and large bunches of white flowers at the ends of the branches, succeeded by clusters of large, reddish-brown, eatable berries.

Other varieties are,] With round ferrated leaves—with round slightly cut leaves.

The fruit of this species being of an agreeably acid flavour, is often served up in desserts to table; and, as the trees of the common sort grow wild in many parts, the country people gather the fruit in autumn for market, known by the name of Service-berries. The leaves are three or four inches long, and three broad.

4. *CRATÆGUS Azarolus*.

The Azarole-thorn.] *Cratægus* with an upright trunk, branching irregularly twelve or fifteen feet high; broad, obtuse, trifid, serrated leaves; and large white flowers in clusters from the sides of the branches, succeeded by large, red, eatable berries, of an acid flavour.

Varieties are,] Azarole with strong thorns—without thorns—with jagged leaves—with double flowers.

The leaves bear some resemblance to those of the *Common Hawthorn*, but are much larger, with broader lobes.

5. *CRATÆGUS coccinea*.

Scarlet Virginia Cratægus, or *American Cockspur-Hawthorn*.] *Cratægus* with an upright trunk, divided upward into a strong, branchy head, rising from ten to twenty feet high; armed with thorns; large, cordate-oval, angulated, ferrated, smooth leaves; and very

large clusters of flowers from the sides of the branches, succeeded by pear-shaped, scarlet fruit.

Varieties are,] Scarlet *Cratægus* with many strong, recurved thorns—Scarlet *Cratægus* without thorns.

Both the varieties are fine furniture for all ornamental plantations, as they flower plentifully, in large showy clusters in May, and their scarlet fruit appears beautiful in autumn and winter.

6. *CRATÆGUS Crus-galli.*

(*Crus-galli*)—*Cockspur Cratægus*, commonly called *Virginia Azarole*.] *Cratægus* with an upright, robust trunk, branching irregularly ten or fifteen feet high, armed with long, sharp thorns; oval - spear - shaped, sawed, smooth leaves; and large white flowers in bunches, succeeded by dark red berries in autumn.

Varieties are,] With obovate-wedge-form leaves—with oblong-lanceolate nearly wedge-form leaves, and large fruit—with lanceolate leaves, short thorns, and small fruit.

7. *CRATÆGUS tomentosa.*

Tomentose Gooseberry-leaved Virginia Cratægus.] *Cratægus* with a shrub-like stem, branching irregularly six or seven feet high, closely armed with thorns; oval-wedge-form, angular, sawed leaves, woolly underneath; and small white flowers, succeeded by yellow fruit.

8. *CRATÆGUS viridis.*

Green-leaved Thornless Virginia Cratægus.] *Cratægus* with a thornless stem and branches; lanceolate - oval, nearly trilobate, serrated, smooth leaves, green on both sides.

The flowers of all these trees, in their common state, have a corolla of five roundish petals, mostly white, appearing principally in May and June, ripen fruit in September, which are all of the berry kind, and which, in many sorts, appear very ornamental great part of the winter, till devoured by the birds.

All these trees are hardy; the first three species grow naturally in England, as well as in most other parts of Europe, the *Azarole* in France and Italy; all the others are principally of American growth; but all the sorts grow freely here in any situation in the open ground.

The first species, *Cratægus Oxyacantha*, or Common Hawthorn, or Whitethorn, in its natural state, is a most valuable tree, universally known and esteemed for its great usefulness in forming hedges for fences, commonly called quick-set hedges, and for which use there is scarce any deciduous tree so well adapted (see *HEDGES*); and its several varieties are of great use for ornamenting our

shrubberies and wilderness-works, as they will prosper any where.

All the other species and varieties have great merit as ornamental deciduous trees, and are particularly well adapted for large shrubberies and other ornamental plantations, and in forming clumps in parks; and some of the large sorts to disperse singly in parks, or extensive lawns, suffering them all to retain their own natural growth.

Likewise the Wild-Service and Azarole may be planted as fruit trees of the berry-bearing kind, for variety; but more generally the former, as it produces plenty of fruit, which, ripening late in autumn when other small fruits are past season, will serve as a good variety at table; so that some trees planted in orchards, pleasure-grounds, parks, gardens, &c. in any common soil and situation, will arrive to a bearing state in a few years, and produce large bunches of fruit annually, ripening, or attaining full maturity of growth, in October, or beginning of November, but not eatable ripe till gathered and housed for some time; the bunches hung up across lines, they will become soft, mellow, and eatable, of an agreeable flavour.

Propagation, &c.

All the species are raised abundantly from seeds in the full ground; and to continue the varieties distinct, they may be budded or grafted upon stocks of the common Hawthorn, for all the sorts will readily take upon that stock, or upon one another.

By seeds, i. e. the fruits—The Hawthorn never fails to ripen Haws abundantly, which may be collected with facility from the hedges of fields, &c. in September and October; the fruit of the two Service-trees may also be found plentifully in many places; and those of the foreign sorts also ripen in our gardens; but all the sorts may be had cheap enough of the nurserymen, and the best time to sow them is soon after they are ripe; that is, in October or November, or early in spring, in beds of light earth, either broad-cast, or in drills, and cover them in with earth about an inch deep; but as most of these seeds often remain in the ground till the second spring, it is therefore customary with many, previous to sowing, to bury them in a heap in a shallow trench, in dry-lying ground, for a year, as is commonly practised to the common Haws, holly-berries, and some other stony-seeded sorts (see *SOWING SEED*); they will be all the while preparing for vegetation, so that if buried in October, November, or December, &c. suffering them to lie until next October, November, or till the second spring, in February, or March; then sow them as above, and they will mostly

mostly come up in the spring; though it is observable that when sown at once in the beds an inch deep, they, by having the constant benefit of the sun's influence, air, and occasional showers, generally all come up freely the second spring after sowing, and most commonly shoot more regular and strong than those of the other method.

In either method of sowing, be careful to weed the beds; and when the plants begin to appear, occasional watering in dry weather will be of much advantage in forwarding the growth of the seedlings.

In the autumn or spring after the plants come up, some of the strongest of the quick or Hawthorn seedlings will be proper sets to plant immediately for a hedge, and the rest may either then, or the year following, be transplanted from the seed-bed in nursery-rows, to remain a year or two, or till wanted; generally, at planting, shorten the tops, and prune the ends of long roots, and plant them in lines one or two feet asunder; and, having two or three years' growth, will be of eligible size to transplant for hedges: or some may remain to obtain a larger size, of two or three feet height or more; but, while in the nursery, should have the sides cut in, and kept thinnest at top; and any runaway top shoot, shortened to some equality with the general growth of the whole; and they will thus be in good order for planting, to form a little hedge at once, that will sooner attain a proper growth of four, five, or six feet; though strong young sets, of two or three years, planted at once for a hedge to remain, will establish their roots firmly, and grow prosperously at top, if kept clear of large overbearing weeds, and the sides cut moderately in some regular order in the summer shoot, to thicken from the bottom upward, as the plants advance, will generally, in the end, form as good, or probably a better hedge than that formed by planting large sets of three or four feet. See HEDGES.

Let all the other seedlings be also transplanted from the seed-bed when a year or two old, in nursery-rows one or two feet distance, and half that in each row, to remain three or four years, or till they are from about three to five or six feet high, when they will be of proper size for the shrubbery, or any other plantation.

By budding and grafting—Any of these trees may also be propagated with facility by that method, which is the most certain way to continue the varieties distinct; all the sorts take upon one another; but the Hawthorn stock of two or three years old is most commonly used,

and the operation is to be performed in the usual manner. See INOCULATION, &c.

Layers of the youngest branches of most of the sorts in autumn, will often be rooted in a year or two.

Cuttings of the young shoots will also sometimes grow.

CRATÆVA, Garlic Pear.

This genus furnishes two exotics of the tree kind for the stove, garnished with trifoliate leaves and quadripetalous flowers.

Class and order, *Dodecandria Monogynia*.

Characters.] CALYX, a monophyllous, quadrid, deciduous cup. COROLLA, four oblong, deflexed petals, with narrow unguis. STAMINA, twelve or more bristly filaments, with erect, oblong antheræ. PISTILLUM, an ovate, very long, slender pedicel, crowned with a headed, sessile stigma. PERICARPIUM, a large, globose, fleshy berry, with one cell, containing many roundish emarginated seeds.

The species of most note are,

1. CRATÆVA *Tapia*.

Smooth Cratæva, or Garlic Pear.] Hath a large branching trunk, rising to twenty or thirty feet high; the branches are garnished with trifoliate leaves, the middle foliole much larger than the other two; the flowers come out on foot-stalks at the ends of the branches, and are succeeded by a round fruit, inclosing a mealy pulp, filled with many seeds, and of a strong garlic smell.

2. CRATÆVA *Marmelos*.

Prickly Cratæva] Hath a large trunk with long branches, armed with long, sharp spines in pairs, garnished with oblong, serrated, trifoliate leaves, and clustered flowers from the sides of the branches, which are succeeded by an eatable, rich-flavoured fruit.

These trees are natives of the Indies, and require the aid of the stove in this country.

Their propagation is by seeds imported from abroad. These should be sown as soon as they arrive, in pots of light rich earth, and plunged in the bark-bed under glasses; and, when the plants are three inches high, transplant them into separate pots, give water, and replunge them in the bark-bed in the stove, where they must always be retained and treated as other woody tender plants of the like nature.

CREPIS, Bastard Hawk-weed.

It furnishes herbaceous ornamental plants for the pleasure-ground, consisting principally of two beautiful annuals, rising a foot and half high, having their branches terminated by compound red and yellow flowers, composed of ligulated florets.

Class

Class and order, *Syngenesia Polygamia Æqualis*.

Characters.] CALYX, a compound flower, having a double general cup; the outer one short, patulous, and deciduous; the interior one oval, furrowed, scales converging and permanent. COROLLA, numerous monopetalous, ligulated, hermaphrodite florets, five-toothed and imbricated. STAMINA, five short capillary filaments, and cylindric antheræ. PISTILLUM, a germen, small style, and two reflexed stigmas. PERICARPIMUM, none. SEMEN, one seed crowned with down, under each floret.

There are many species, but not more than two of any great merit, or that are commonly retained in the English gardens, which are annuals, and called simply Hawk-weed, but should be Bastard Hawk-weed.

The species of our gardens are,

1. *CREPIS rubra*.

Red-flowering Bastard Hawk-weed.] *Crepis* with spear-shaped, jagged, radical leaves, spreading on the ground; between them the flower-stalk, dividing into many erect branches a foot and half high, having oblong, lyre-shaped, amplexicauleous leaves, and every branch crowned by a large, red, compound flower.

2. *CREPIS barbata*.

Barbated Yellow Bastard Hawk-weed.] *Crepis* with long, spear-shaped, indented, radical leaves; between them the flower-stalk, dividing into erect branches a foot and half high, garnished with small, spear-shaped, close-fitting leaves; and all the branches terminated by compound yellow flowers, with dark-purple middles, having the involucre longer than the calyx, squamous and bristly.

Varieties of this,] With deep-yellow flowers—with sulphur-coloured flowers—both sorts having dark-purple disks.

The flowers of all the sorts are large, compound, of many flat florets spread over one another imbrication, and, when fully blown, resemble a radiated flower, and appear in June, July, and August, extremely conspicuous and beautiful, and are succeeded by plenty of seed, from which, if permitted to scatter on the ground, many plants will rise without trouble.

These plants are pretty ornaments to the borders and other compartments of the pleasure-ground, and they grow freely in any common soil of a garden.

Propagation, &c.

The plants being annual, they must be raised annually from seed, which may be sown either in autumn or spring; the rule is, that by sowing in autumn, i. e. in August or

September, or the seeds permitted to scatter, the plants come up the same season, or early in the spring, and flower in May, June, and July; those sown in spring flower in July, August, September, and October.

Though, for the general part, the spring is the most eligible for the principal sowing; however, at either of these seasons of sowing, it is proper to sow them at once in the places where you design them to flower; therefore, in different parts of the borders, in patches at five, ten, or fifteen feet distance, sow the seeds, five or six in a patch, half an inch deep, placing sticks for marks; and when the plants are two or three inches high, thin them to three or four in each hole or patch. See HARDY ANNUALS.

CRESCENTIA, Calabash-tree.

It furnishes one species of the tree kind, admitting of several varieties, all of the West-Indies, &c. and retained here in our stoves for variety; derives its name from its fruit, called Calabash, which is sometimes as large as a man's head.

Class and order, *Didynamia Angiospermia*.

Characters.] CALYX is monophyllous, and divided into two roundish segments. COROLLA is monopetalous and irregular, having a curved, gibbous tube, and erect limb, five-parted at the brim. STAMINA, two long and two short filaments, and incumbent didymous antheræ. PISTILLUM, a pedicillated germen, filiform style, and capitated stigma. PERICARPIMUM, a large, baccaceous, oval, or bottle-shaped fruit, with a thin, hard shell, and many seeds.

The species is,

CRESCENTIA *Cujete*.

Common Crescentia, or Calabash-tree.] *Crescentia* with an upright, robust, whitish trunk, divided at top into a large, horizontally branching head, from ten to thirty feet high, garnished with large, oblong, wedge-shaped, entire leaves, and greenish-yellow flowers on long foot-stalks from the sides of the branches, succeeded by large, woody-shelled fruit of different forms and magnitude, in different varieties.

Varieties are,] *Crescentia* with long, spear-shaped leaves, narrow at both ends—with broad oval leaves—with large oval fruit—with small round fruit—bottle-shaped fruit.

These fruit are of different magnitudes, from the size of a good orange to that of a man's head, or larger, all of which fruit have a hard and thin shell, filled with pulp and seeds; the pulp is soft, sour, and unsavoury, and seldom eaten.

These trees in this country, being always retained in pots in our stoves, assume a shrub-like

like growth, and I believe very few, if any at all, have yet flowered in these parts.

In Jamaica, Barbadoes, and other parts of the West-Indies, the trees growing as large and spreading as an apple-tree, bear abundance of fruit, the shell of which, having the pulp scooped out, is as thin and light as brown paper, and some of the largest capable of holding six or eight pints of water, &c. and are chiefly used for liquor and eating utensils.

All the varieties are propagated by seeds procured from abroad in the shells; as soon as they arrive, take out the seeds, and sow them in pots of light rich earth, and plunge them in a bark-bed; and when the plants are two or three inches high, plant them out in separate small pots, plunging them also in a hot-bed, or the bark-bed in the stove, where they must always remain, giving them the necessary care of other tender exotics.

CRINUM, Asphodel Lily.

This genus furnishes four beautiful flowery perennials of the tuberous and bulbous-rooted tribe for the stove, producing erect, firm stalks two or three feet high, crowned each by a large umbellate cluster of spathaceous, monopetalous, long, funnel-shaped flowers.

Class and order, *Hexandria Monogynia*.

Characters.] CALYX, a diphyllous, oblong, spatha-like involucre, becomes dry and reflexed. COROLLA, monopetalous and funnel-shaped, having a long tube, the top deeply divided into six spear-shaped, concave, obtuse, reflexed segments. STAMINA, six very long filaments, and oblong, incumbent, rising antheræ. PISTILLUM, a germen at the bottom of the corolla, slender style, and trifid stigma. PERICARPIMUM, a suboval, trilocular capsule, having several seeds.

The species are,

1. CRINUM *asiaticum*.

Asiatic Keel-leaved Crinum.] Crinum with a solid, turbinated, bulbous root; short, thick, single stem; long, carinated, subulate-linear, thick, erect, imbricated leaves, three feet in length; and large, flat, simple umbels of many white flowers—Native of Ceylon, Malabar, &c.

2. CRINUM *americanum*.

American Lily-Asphodel.] Crinum with a large bulbous root; flower-stem a foot and half or two feet high; oblong-lanceolate, smooth, stiff leaves, two feet long; and umbellate bunches of white flowers, with the tube shorter than the border—Native of South-America.

3. CRINUM *crubescens*.

Seffile-flowered American Lily-Asphodel.] Crinum with a bulbous root; lanceolate

leaves, gristly-crenated, two feet long, the end produced and unfolded; and upright flower-stalk, arising on the outside of the leaves, two feet high, topped with an umbellate bunch of white, sweet-scented flowers—Native of the Spanish West-Indies.

4. CRINUM *latifolium*.

Broad-leaved Asiatic Crinum.] Crinum with a large fleshy root, crowned by oval-lanceolate, plane, acuminate, close-fitting leaves, and flower-stalks two feet high, terminated by large umbellate clusters of white fragrant flowers, striped with purple.

The roots of all these plants are perennial; the stalks annual, round, thick, succulent, hollow, and universally crowned by a sort of spatha protruding the umbels of flowers, each separate flower formed of one long, tubular, six-parted petal, of great beauty, appearing at different times of the year, but more commonly in autumn, often continuing till spring, frequently succeeded by capsules, especially the bulbous sorts, between which are produced small bulbs, which, planted, become proper plants.

Propagation.

They are all propagated by the off-sets of their roots, or by the small cauline bulbs of their capsules; but the root off-sets flower soonest, planting them in pots of rich earth, and plunge them in the bark-bed of the stove until they begin to flower, when they may either be placed upon the shelves, or permitted to remain in the bed, as convenient.

It is proper to shift or transplant the roots of all the sorts every year or two, at their period of rest, for the sake of fresh earth, and separating the off-sets.

CRITHMUM, Samphire.

One species, a hardy, herbaceous, succulent perennial, both esculent, and for variety, rising two feet high, with fleshy eatable leaves, and terminated by yellow umbels of flowers.

Class and order, *Pentandria Digynia*.

Characters.] CALYX, umbelliferous flowers, having a many-leaved general involucre. COROLLA, a uniform general umbel, the florets of five petals. STAMINA, five filaments, and roundish antheræ. PISTILLUM, a germen under each floret, two styles, and reflexed stigmas. PERICARPIMUM, none. SEMINA, a compressed, two-parted fruit, and two seeds.

The species are two, but the principal one is,

CRITHMUM *maritimum*.

Common Maritime Samphire.] Crithmum with a fibrous, penetrating root; thick, succulent, branchy stalks, two feet high; winged, fleshy leaves, of many small, spear-shaped, fleshy

fleshy lobes; and round yellow umbels of flowers at the top of the stalk and branches.

This plant grows naturally on the sea-coasts among the gravel and rocks; its leaves are an excellent pickle, used for sauces, and are by many eaten raw in sallads, are of a saltish relish, palatable, and comfortable to the stomach, and are brought by the simpliers in great plenty to the London markets.

To propagate this plant in gardens, either as an esculent, or for variety, sow the seeds in some moist, gravelly, or sandy situation, half an inch deep; the plants will come up, and endure many years.

They may also be increased by parting the roots.

CROCUS, Saffron, but commonly called *Crocus*.

The plants are very low, flowery, ornamental perennials, of the bulbous-rooted tribe, valuable for ornamenting the fronts of our borders at early spring and late in autumn; for there are vernal and autumnal sorts, of each many varieties, all of which are acaulous. so that the flowers and leaves rise directly from the root, attaining only from about three to five or six inches high.

Class and order, *Triandria Monogynia*.

Characters.] **CALYX**, a monophyllous spathe. **COROLLA** is monopetalous, with a long, erect tube, and the limb deeply divided into six equal, oblong, erect segments. **STAMINA**, three filaments shorter than the corolla, and arrow-pointed antheræ. **PISTILLUM**, a roundish germen under the corolla, slender style, and three twisted stigmas. **PERICARPUM**, a roundish, trilobate, trilocular capsule, containing roundish seeds.

Modern botanists admit of but one real species of *Crocus*, which however comprehends many beautiful varieties, and the following description of the original species is applicable to the whole, in respect both of the root, manner of growth, mode of flowering, general habit and stature of the plants; only sometimes by culture, the bulbs will increase in magnitude, the leaves in breadth, and the flowers larger; so that the main difference of the numerous varieties is in the colourings of the flower, and the times of flowering, spring and autumn; observing, that although the autumnal *Crocus* is probably the original species, the spring *Crocuses* are considerably the most numerous.

They may be divided into two classes, the autumnal and spring flowering.

Autumnal Crocuses.

1. *CROCUS officinalis*.

Officinal Crocus, or Saffron.] *Crocus* with small, roundish, brown, bulbous root, com-

pressed at bottom; and directly from the root issue many long, narrow, deep-green leaves; and amidst them the flowers, protruded from a thin, univalvular, radical spathe; the tube of the flower long, standing on the root, and serving as a foot-stalk to the limb or upper part, which is erect, six-parted, widens gradually upward, and grows from about three to five or six inches high, containing the style in the centre, crowned by the stigma, trifid or divided into three long segments of a golden colour (the Saffron)—flowering in September or October.

Varieties of the *Crocus autumnalis* are as follow: the first of which is the original *Crocus*, or Saffron.

Saffron Crocus (Crocus officinalis)—A long-tubed bluish-purple flower, having its three *stigmata* of a fine reddish-golden colour; which part is the officinal Saffron: hence the name.

Autumnal small blue *Crocus*—deep-blue—sky-blue—whitish-blue—many-flowered whitish-blue—purple—large rush-leaved purple—and autumnal white *Crocus*—autumnal yellow *Crocus*.

All these varieties of *Crocus autumnalis* flower about the beginning of October, but never furnish seeds here; they are very beautiful in patches in the fronts of borders, or in beds by themselves, and very proper autumnal ornaments for gardens of every extent, as coming into full bloom at a season when most other flowers are on the decay; and they grow freely in any common soil, and, although they produce no seeds in England, they increase in tolerable plenty by off-sets of the roots.

The flowers of these commonly appear before the leaves, which, when the flowers fade, continue their growth, remain all winter, and decay in May following, when is the time to remove the roots, which should be every two or three years.

Spring Crocuses.

2. *CROCUS vernus*.

Vernal, or Spring Crocus.] *Crocus* with a larger, compressed, brown, bulbous root, sending up very narrow, slender, deep-green leaves; and amidst them arise one, two, or three flowers, protruded from a thin, univalvular, radical spathe; the foregoing species growing only two or three inches high: the style rising in the centre, crowned with a broadly-flat stigma, very shortly three-parted—flowering early in the spring.

Varieties of Vernal or Spring *Crocus* are, *Yellow.*] Small yellow *Crocus*—large yellow *Crocus*—golden-yellow *Crocus*—yellow black-striped cloth of gold *Crocus*—yellow purple-

purple-striped Crocus—double cloth of gold Crocus.

Whites.] White Crocus—white purple-striped Crocus—white purple-bottomed Crocus—white black-striped Scotch Crocus—whitish cream-coloured Crocus—whitish ash-coloured Crocus—little narrow-leaved white Crocus—white blue-striped Crocus.

Blues.] Small blue Crocus—large deep blue Crocus—blue purple-striped Crocus—blue violet-striped Crocus—pale-blue purple-bottomed Crocus.

Purples.] Small purple Crocus—large purple Crocus—striped purple Crocus.

Polyanthus Crocus—having many purple-violet white-striped flowers.

All these beautiful varieties of *Crocus vernus* flower in February, March, and April, and ripen seeds in May; they are all very ornamental spring flowers, and valuable for their early appearance, when very few other flowers are to be seen, and are so hardy that they will grow almost any where, and rear their flowery heads even when chilling colds prevail; and, where duly disposed along the fronts of borders or clumps, make a fine show a month or six weeks; and they increase abundantly by off-sets of their roots, as well as furnish seed for raising new varieties.

The flowers and leaves of all these spring varieties generally rise nearly together, though the flowers rather appear first; the leaves continue their growth till May or June, when they wither; and this is the time to remove the roots, which is necessary every two or three years, to separate the numerous off-sets. See **BULBOUS ROOTS.**

Planting, Culture, Propagation, &c.

In respect to the planting and culture of all the varieties, both of the autumnal and vernal Crocus, for ornament in gardens, they may all be planted in any of the common borders, &c. without any other preparation than common digging, and a blunt-ended dibble, or small garden-trowel, to be used in planting; the following is the general management of both the classes of varieties, i. e. autumnal and spring-flowering.

Autumnal Crocuses.—These varieties may either be planted in beds by themselves, in rows nine inches distance, or in patches along the fronts of borders, as directed for the spring Crocuses.

The bulbs for planting may be had of all the nurserymen for two or three shillings per hundred.

The best season to plant these autumnal kinds is in July or August, observing, in either of the above methods of planting, to set the

roots about two inches deep; they will flower in September or October following, and continue to flower annually at the same season: they may remain undisturbed two or three years, when it is proper to take them all up, to separate the increased off-sets, and fresh dig the ground, &c. which should be done in June, selecting the largest and roundest roots, to plant for the future bloom; these should be planted again in July or early in August, that they may blow in due perfection the following October.

Their general propagation is by off-sets, as above; and from a few bulbs of each sort you will soon have plenty, by means of an annual increase.

Of these autumnal kinds, the Saffron Crocus is in great repute, as an invaluable article in trade, for its production of the commodity commonly called Saffron, being the long, trifid, golden stigmas, in the centre of the blue flower; and for which the plants, or roots, are cultivated in fields, in considerable quantities, in many parts of England, such as at Saffron-Walden, in Essex, where it has been long cultivated in great abundance in the surrounding fields, as a profitable agricultural plant; which is generally allotted a moderately light, mellow ground, previously well ploughed in spring and summer; and the Saffron roots are then planted in July, or early in August, generally in small trenches, placing the roots three or four inches asunder, covered over with the earth of the next trench, and so proceeding in planting the whole: they all flower the same year, in autumn, about September or October; and produce the Saffron, which is then gathered, by pulling up the whole flowers; and these being housed, the stigma, or Saffron part, is pulled out, and separated from the flower-petals.

The roots remaining, the leaves come up in growth all winter till next summer, then decay: and the same roots still continuing, produce a crop of Saffron annually; but are generally taken up every third year, both to separate the increased off-sets, and to select the best roots for replanting, as well as to fresh prepare the soil, or to plant them in another situation.

Vernal or Spring Crocuses.—These are often planted in a single row close along the edges of beds or borders; but to have them effect as great a variety, and as grand a show, as possible, I would advise planting some also in patches of different-coloured varieties alternately, both along the front of the borders, and towards the middle, in a varied manner, or in the fronts of shrubbery clumps; so in patches of five or six inches diameter, plant five, six,

or eight roots; and the distance of the patches may be, for those in the front, from eighteen inches to three feet distance, and those towards the middle of the borders should be at the distance of three or four to five or six feet, and, in general, planted about two inches deep.

The bulbs of all the varieties are sold by the nurserymen and seedsmen, from ninepence to three shillings per hundred, according to the sorts; or a hundred, including some of every sort, for three shillings.

The season for planting them is September, October, and November, though it may be performed any time in open weather, from September to February; observing, however, those planted before Christmas flower considerably the strongest, observing the method of planting above directed.

The roots may remain two or three years without being removed, though, as the bulbs in that time will be increased by their off-sets into large bunches, it is proper to take them up to separate them; the proper time is May or June, when the leaves wither, observing to separate the large from the smaller; and after being dried and cleaned, put them up till the planting season, as above mentioned, when the larger ones are to be planted in the borders, as before, and the small ones, if wanted, may be planted in a bed, in rows six inches asunder, to remain a year or two to grow larger, when they will be fit for your borders, or for sale.

The propagation of all the tribe of spring Crocuses is effected plentifully by off-sets, as above observed; and from a few bulbs of each variety, you may in two or three years have a large increase; and those who incline to try for new varieties may have recourse to seed, as directed for *Colchicums*.

In most gardens it is customary to cut off the long green leaves of the Crocus soon after the flowers decay, but this is injurious to the growth of the bulbs, and is done principally because the leaves, becoming long and straggling, have a littering appearance at the edge of the borders; but if this appearance could be dispensed with, and the leaves permitted to remain till they wither, it will nourish and prove beneficial to the roots, as will be obvious in their future bloom.

CROTALARIA, (*Crotalaria*.)

This genus comprehends many species both of shrubby and herbaceous plants, mostly exotics of the West and East-Indies; and the greater part possessing but little merit for our purpose, shall only notice one shrubby species which deserves observation as an ornamental-flowering exotic for the stove, of shrubby

growth, with ternate leaves, and spikes of papilionaceous yellow flowers.

Class and order, *Diadelphia Decandria*.

Characters.] CALYX, large, three-parted, shorter than the flower. COROLLA, papilionaceous, the standard large, heart-shaped, acute, the wings ovate, shorter by half than the standard, an acuminate keel the length of the wings. STAMINA, ten diadelphous rising filaments, crowned with simple antheræ. PISTILLUM, an oblong, reflexed, hairy germen, simple, rising style, and obtuse stigma. PERICARPIUM, a short, turgid, leguminous, bivalvous pod, of one cell, pregnant with one or two globose-kidney-shaped seeds.

The species.

CROTALARIA *laburnifolia*.

Laburnum-leaved Indian Crotalaria.] Crotalaria with a shrubby stem, dividing upward into many branches, four or five feet high; ternate or trifoliate leaves, having three ovate, acuminate lobes, of a light-green colour, about two inches long, and one broad; and the branches terminated by large spikes of many large, beautiful, yellow flowers, appearing great part of summer, very ornamental, and succeeded by pods and seeds.

This species being a tender exotic, native of India, requires a place in the hot-house or stove in this country great part of the year; for, though it will endure the open air here in the heat of summer, for two or three months till September, it must then reside in the stove till June or July. It is propagated by cuttings in spring and summer in a hot-bed: also by seed in the spring.

CROTON, Base Ricinus, or Tallow-tree.

A genus consisting of herbaceous and shrubby plants for the stove, garnished with male and female flowers.

Class and order, *Monœcia Monadelphica*.

Characters.] CALYX, monœcious flowers, having a cylindric, five-toothed cup in the males, and oval, oblong, many-leaved cup in the females. COROLLA, in the males, five oblong petals, scarce longer than the cup, and in the females, the same, but very small. STAMINA, ten or fifteen filaments, joined at their base, with roundish twin antheræ. PISTILLUM, a roundish germen, having three reflexed, spreading styles, crowned with bifid, reflexed stigmata. PERICARPIUM, a roundish, trilocular capsule, containing oval, large seeds.

There are several species, of which the following shrubs are generally retained in our hot-houses.

1. CROTON *schiferum*.

Tallow-bearing, Poplar-leaved Croton, or Tallow.

Tallow-tree.] Croton with smooth, entire, rhomboidal, oval leaves. This last species is tolerably hardy; the others, which are ever-green, require a stove for their protection.

2. CROTON *lineare*.

Linear Willow-leaved Croton.] Croton with a shrubby stem, and linear, obtuse, entire leaves, the under part downy.

3. CROTON *glabellum*.

Smooth-leaved Croton.] Croton with smooth, oval, entire leaves, and pedunculate fruit.

They are propagated by seeds sown on a hot-bed in the spring, and afterwards managed as other seedling stove-plants.

CRUCIFORMIS *Flos*, a Cruciform, or Cross-shaped Flower; a Flower composed of four equal petals, which spread above, on their claws, four different ways, in form of a cross; stock-gillflower, rocket, candy-tuft, lady's smock, and honesty, furnish examples.

CUCUMIS, Cucumber, and the *Cucumis Melo*, the Melon.

The Cucumber and Melon, though vastly different in the external habit of their fruit, have exactly the same botanic characters in their flowers: so the plants are consequently both species of the genus *Cucumis*, very tender annuals of trailing growth, valuable for their most excellent fruit.

Class and order, *Monœcia Syngenesia*.

Characters.] CALYX, male and female flowers apart on the same plant, having each a monophyllous, bell-shaped cup, terminated by five awl-shaped bristles. COROLLA is in both sexes monopetalous, bell-shaped, divided into five oval, rough segments, and adheres to the calyx. STAMINA, in the males, three very short connivent filaments inserted into the calyx, two of them bifid at top, and narrow antheræ, creeping upward and downward, adhering to the outside. PISTILLUM, in the females, an oblong germen under the corolla, very short style, crowned by three thick, gibbous, tripartite stigmas. PERICARPIUM, a fleshy, oblong, and roundish, trilocular fruit, and numerous oval, acute, compressed seeds.

The Cucumber and Melon have, by most authors heretofore, been treated as distinct genera; but the Linnæan system determines them to be of the same genus, and in which we must therefore also range them, though, for distinction sake, under two separate heads; first the Cucumber, *Cucumis sativus*; second, the Melon, *Cucumis Melo*.

First Head.

The Cucumber.

Of the Cucumber there is but one real species, but of which are several curious and

valuable varieties of the fruit; and as to the plants, they are herbaceous trailing annuals and exotics of the most delicate tender temperature, unable to endure the open air here, except about three or four months in the heat of summer; and to raise them in early perfection, requires the aid of substantial hot-beds, under frames and glasses; and the culture of them, at an early time, being esteemed a most curious branch of gardening, it excites an ambition in most gardeners to excel each other in their production as early in the spring as possible.

The species is,

CUCUMIS sativus.

Cultivated, or Common Cucumber.] *Cucumis* with roots composed of numerous, long, slender, white fibres; long, slender stalks, very branchy at their joints, trailing on the ground, or climbing by their clasps, adorned at every joint by large, angular leaves, on long, erect foot-stalks; and numerous monopetalous, bell-shaped, five-parted, yellow male and female flowers, at the same or different joints, the females succeeded by oblong, rough fruit.

Varieties are as follow:

Common Rough Green Prickly Cucumber—A middle-sized fruit about six or seven inches long, having a dark-green, rough rind, closely set with very small prickles; the plant is of the hardiest sort, bears plentifully in summer, but does not show fruit early, so is not proper for frames.

Short Green Prickly Cucumber—A short fruit three or four to five or six inches long, the rind rather smooth, and set with small black prickles; is valuable principally for being one of the most early sorts; that is, as to early, the plants frequently begin to show fruit at the first, second, or third joint, whereby we may expect fruit in perfection much sooner than from such plants as do not show fruit till they advance several joints in length.

Long Green Prickly Cucumber—A long, handsome fruit, from about six to ten or twelve inches long, rather thinly set with prickles; the plants are remarkably good bearers; and as there is an early and late sort, it is considerably the best variety of Cucumber for the main crops, both in the frames and hand-glass, as well as in the open ground for picklers.—Variety of this with white fruit.

Early Green Cluster Cucumber—A shortish fruit, remarkable for growing in clusters, and appearing early.

Long Smooth Green Turkey Cucumber—The plants are strong growers, with very large leaves, and long, smooth, green-rinded fruit.

without prickles, obtaining from ten to fifteen inches in length.

Long Smooth White Turkey Cucumber—The plant a strong grower, and smooth-rinded fruit without prickles, from ten to fifteen inches long.

Large Smooth Green Roman Cucumber—A strong-growing plant, and very large, long, smooth, green fruit.

Long White Prickly Dutch Cucumber—A white fruit, eight or ten inches long, set with small-black prickles; the plants but bad bearers in England.

Of the above varieties, the first four are considerably the best bearers in this country, and the only sorts to be depended on, both for the early and main crops, and the Long Green Prickly sort most of all; the last four varieties being, for the general part, but indifferent bearers, are improper to be employed either for an early, or any general summer crop; but as the fruit is singularly large and beautiful, a few plants of each sort should be admitted in the summer crops, under the hand-glasses, &c. or in the common ground, among the late crops.

All the above sorts, though only varieties, yet by care in raising each respective sort in separate beds, or so as the farina of the flowers of the different sorts may not impregnate each other, will continue tolerably permanent; but without this care they in time will vary to one another.

The flowers of all the varieties of *Cucumis* are monœcious, i. e. male and female apart on the same plant, either at different joints, or both arising at the same joint; the male flowers are those commonly, but erroneously, called false blossoms, and are often pulled off; but they are so far from being false or useless, that, without their vicinity and assistance, no good fruit can be expected; for they contain upon their antheræ the pollen, or fecundating golden powder, so essentially necessary for the impregnating the ovary of the female flower, by which only the fruit sets, swells to maturity, and produces fertile seeds: both male and female flowers are distinctly obvious, both before and after they open; the male flower stands immediately upon the top of its foot-stalk, without any appearance of germin or fruit under it; the female flower discovers the germin or embryo fruit immediately under its base, so that the flower sits close upon the top of the fruit, as is apparent even from its first issuing from the branch, when not so big as a very small barley-corn; from the first appearance of the miniature fruit till its maturity, i. e. fit to cut for the table, it

takes up generally from about eighteen to one-and-twenty days' growth, sometimes a few days longer.

Cucumbers at an early season are highly valued, and are esteemed almost the greatest rarity of a garden; principally, because the plants are of so extremely tender and delicate nature, as to require considerably more attention and skill in their early culture than any other esculent of our kitchen-garden collection, except the Melon, which is nearly of the same temperature, and both of which, in the article of hot-bed culture, afford opportunities for a gardener to display his abilities, and raise his reputation, as eminent in his profession.

What is to be understood by early Cucumbers, are principally such as arrive to perfection in February, March, and April, and are obtained by hot-beds, under frames and glasses, begun about Christmas; though, to have Cucumbers in May, June, and July, the aid of hot-beds and glasses is also requisite, made in January, February, &c. till the middle or latter end of May; but in May, or beginning of June, when the weather becomes warm and settled, the seeds will grow in the full ground, and the plants will bear the full air till the end of September, after which time the cold nights soon destroy them; so that if the fruit is required after that time, the plants must be protected by frames, &c.

Observations on their General Culture.

As to the propagation of Cucumbers, the plants being annual, must of course be raised every year from seed; and the season and order of sowing is, either in hot-beds, any time from about Christmas till May, or in the full ground in the middle or latter end of May, or beginning of June; observing, that as the plants rarely succeed in the open air before June, all intended to be raised before that time require more or less artificial heat, and shelter of frames, glasses, &c.

By artificial heat in the culture of these plants, may be comprehended not only that of dung hot-beds, the most common method, under common garden-frames and lights, hand or bell-glasses, &c. but also that of stoves, effected by bark-bed heat and actual fire; in which departments the plants may be raised at almost any season; dung hot-beds, however, under frames, &c. are the most successful, and best for any general early crop; but we shall exhibit both methods in their proper place.

The particulars to be materially observed, relative to the times of sowing and having Cucumbers for use, are—To have Cucumbers early,

early, i. e. in perfection in March and April, it is performed by hot-beds, under frame and glasses, begun about Christmas, or between that and Candlemas; or to have them come in for use in May, the same aid is also requisite, beginning in February or March; and even when they are not required till June and July, the aid of moderate hot-beds is likewise necessary, made in April, or beginning or middle of May, either under frames, or hand or bell-glasses; or those made in May might be covered with paper lights, in default of others; but for late crops, to come into use in August and September, no artificial heat nor covering is necessary, as, in the middle or end of May, or beginning of June, when the weather is become settled and warm, the seed may be sown in the full ground, and the plants will come up, and attain a bearing state in two months; but to have Cucumbers from the earliest to the latest period, some endeavour to have them fit to cut about Christmas, by beginning with a moderate hot-bed in October; and some are ambitious of having them for the table the year round, so continue sowing every month in the year: it is, indeed, often easier to have Cucumbers at Christmas, than a month or two later; and it is much easier to have them in April and May, than in February or March; and less dung for hot-beds, as well as less attendance, is required: however, to have good general crops from spring till autumn, three different principal crops are generally raised at three different times, from about Christmas or Candlemas till June; the first, or earliest, to be in hot-beds, under frames and glass lights; the second, or middle crop, also in hot-beds, under hand or bell-glasses, &c. and the third, or latest crop, is in the common ground; each of which crops is exhibited separately.

By the above hints you will readily judge of the time to begin Cucumber-framing, according to the times the Cucumbers are required for use, or according to your convenience in respect to frames, glasses, dung for hot-beds, mould or earth, &c. for unless you are properly accommodated with these materials, you should never attempt having Cucumbers very early; for, as above hinted, it is much easier to have them in April, May, and June, than in February and March.

The principal materials necessary in the early culture of these plants in dung hot-beds, under frames and glasses, &c. are as follow.

For the early crops, frames and lights of two or three different sizes, for the same number of different hot-beds; that is, a small frame of one or two lights for the seed-bed, another

of larger dimensions, or a two-light one, for the pricking out or nursery-bed, and one or more two-light or three-light frames, for the final or fruiting hot-bed; each frame furnished with glass lights perfectly wind and water-tight. See FRAMES.

For the middle crops, in hot-beds made in April and May, you may either use frames and lights, or principally hand-glasses, either square ones or bell-glasses, or, in default of these, oiled paper frames.

Horse stable-dung for making the hot-beds is a principal article; procure such as is fresh, full of heat, neither too long and strawy, nor too short, but a due mixture of both; one cart-load, or twelve or fifteen wheel-barrow-fuls to each light, or about thirty at least to each three-light frame, making an allowance also of a due portion for occasional linings; all of which ought to be previously prepared by casting it up in an heap about a week, or ten or twelve days, to forward the whole to an equal and regular fermentation, and that the violent burning-quality, rank steam, and unwholesome stench may evaporate; and if turned over once or twice, it will be more effectually prepared. See HOT-BEDS.

Earth for moulding the beds.—This should be very rich, moderately light and dry, having been previously prepared in a compost heap, two or three months, or more (see COMPOST); or good light kitchen garden earth, enriched with rotten dung of old hot-beds, is a proper soil; and if blended with a moderate portion of fine, light, fresh loam, properly incorporated, it will invigorate its vegetative quality; preparing the whole in an heap, as above, several weeks or months before using it; likewise observing, that, before using the mould for the early hot-beds, a due quantity should be wheeled into a dry, covered shed, open to the sun and free air, to be defended for a fortnight or three or four weeks, to have it of a moderately dry temperament, which is most necessary in early framing; and, when the mould is to be used, it is not advisable to screen it, only clear out large stones, and break the clods as small as possible with the spade and hand, as sifting or screening would render it too compact for the tender fibres; besides it is apt to bind, and by lying too close, and confining the steam, is more apt to burn at bottom, by the heat of the dung of the hot-bed.

Mats of bafs, reeds, or straw, are necessary for covering the glasses of the hot-bed on nights, and all bad weather; but bafs-mats are the most convenient and effectual covering. See MATS.

Small

Small pots (thirty-twos and forty-eights) are also necessary in early Cucumber culture, both for sowing the seed in occasionally, and for pricking the seedling plants in, three or four in each pot, whereby the plants may be occasionally removed in pots, if necessary, from one hot-bed to another, to forward them; and also be more readily transplanted for good into the fruiting hot-bed, with the whole ball of earth of each pot about their roots, so as not to feel their removal; and each pot of plants serves for one light, that is, three pots for a three-light frame.

As to the situation proper for the early culture of these plants in hot-beds, chuse a place that fronts the south, and is open to the whole day's sun; and, if possible, where the ground is dry, or, at least, where water is not apt to stand; if of a gentle declivity, the better, and if inclosed, either wholly, or on the north, and east, and west sides, with a reed hedge or paling, &c. to break the winds, it will be a particular advantage.

Dig no trench, as often practised, wherein to make the bed, especially in early work, but make it entirely on the surface of the ground, being proper both to preserve the bottom from being chilled by standing water, and that the whole of the bed, from the very bottom, may receive the benefit of linings of hot dung to the sides when the heat declines: and if the ground is wet, or water apt to stand in winter, I would advise rather to raise the part gradually higher than the general level, that the moisture, or falling water, may run away from the bed.

For the latter crops, raised in the open ground in May or June, nothing more is necessary than sowing the seed half an inch deep in a rich soil; the plants will come up, and bear plentifully in August and September.

With respect to seed—in the choice of this for early crops, you will of course procure that of the early short or long prickly sorts; the latter is best for any general crop; and if you save the seed yourself, it is of importance to save it from some of the earliest fruit, that appear at the first, second, and third joint of the main runners; and this seed, if possible, should be, at least, two years old before you sow it, but if three or four, the better, because plants raised from new seed are apt to fly luxuriantly into vine, without showing fruit in any reasonable time, so are consequently improper for early work; but if you are necessarily obliged to use new seed, endeavour to prepare it, by keeping it three or four weeks in your breeches pocket, previous to the time of sowing, the drying heat

of which will divest it of part of its luxuriant quality.

We now proceed to the culture of the different crops; and as the early culture, in hot-beds, of these plants and melons, requires the gardener's attention more than that of most other plants, we will enlarge on that article, and explain, as well as possible, the essentials of the whole process according to real practice.

Their early Culture in Frames in the Seed and Nursery-bed.

The time to begin the culture of early Cucumbers in frames is to be according to the foregoing observations; but some time between Christmas and Candlemas is the most common season to begin that work.

In the culture of early Cucumbers, it is proper, where there are good accommodations of frames and hot dung, to forward the first crop in two or three different hot-beds; a small one for a one-light frame, in which to sow the seed, and raise the plants a few days old; a second, of larger dimensions, for a large one-light or two-light frame, by way of nursery-bed, in which to prick the plants from the seed-bed into pots, to remain three weeks or a month, till their two first rough leaves are two or three inches broad, and the plants have formed one joint; then to be transplanted with the balls of earth about their roots into a third and final hot-bed, to remain to fruit; the planting in this last bed gardeners call ridging out; however, if the seed-bed is made substantial for a large one-light, or a moderate two-light frame, it is very possible, by aid of occasional linings, both to raise the plants, prick them down, and continue them in the same bed till large enough for the fruiting hot-bed.

Proceed therefore to prepare the seed hot-bed according to the above rules, procuring for this purpose hot dung in quantity, quality, and preparation, as before directed; which being ready, then, either with four stakes, or mark out on the ground the proper dimensions of the bed, according to that of the frame, allowing for the bed to be rather two or three inches wider on every side: begin the bed by laying some of the longest dung in the bottom, afterwards take it as it comes to hand, mixing the short and long well together, and spread it regularly on the bed, beating it firmly down with the fork as you go on, till raised to the proper height; observing, if you intend it only just to raise the plants, two feet and a half is high enough; but if designed both to raise and forward the plants large enough for the fruiting-bed, it is proper to make

make it three feet six inches high at least; but especially if the dung consists of very long litter, full that height in dung is not too much, since it will settle almost a foot in a week's time. See HOT-BEDS.

As soon as the bed is made, set on the frame and glasses, keeping them close a day or two to draw up the heat; then tilt the lights behind, for the steam to pass off.

In six or eight days, according to the substance of the bed, it will be of a proper heat; or if rather too strong, let the vehement heat begin to abate, when you may earth the bed with the prepared mould, before mentioned, five or six inches thick; and the same or the following day, as soon as the earth is warm, sow the seed, drilling it in near half an inch deep.

But if you are in haste to forward your plants as much as possible, or that you would use only one hot-bed both for the seed and nursery-bed, let the bed be made substantial as before observed, for the largest one-light, or for a two-light frame, according to the quantity of plants required; so that by sowing the seed in small pots (thirty-twos) you may use the bed the same, or next day after it is made, as soon as it begins to heat, covering it all over with any sort of dry earth, or with old tan five or six inches thick, filling some pots with rich mould, and plunge them a little in the earth, &c. and next day, the earth in them being warm, sow fifteen or twenty seeds in each; but observing, if there is danger of burning, draw up the pots more or less in proportion as you see it necessary, to prevent the earth, &c. from being burned; and in about a week the plants will be up and fit to prick in pots, by which time the bed will be arrived at a moderate heat.

The seed however being sown in either method, do not omit tilting the glasses behind an inch or two occasionally, to pass off the steam, and cover the glasses on nights with mats.

Thus the plants will come up in two, three, or four days, observing now to admit fresh air daily, by raising the lights an inch or two behind, also occasionally on nights, according to the rules hereafter directed; and cover every night with mats: when their cotyledons, or seed-leaves, are fully out of the earth, and begin to expand about half an inch in breadth, it is proper to prick them in pots (forty-eights) previously filled with rich earth within an inch of their rims, and placed in the frame a day before to warm, either in the same bed, made substantial at first for that purpose, otherwise in a new hot-bed, as you shall judge necessary, prepared a week before, and earthed with dry,

light mould, or old tan, six inches deep, for the reception of the pots: in either of these beds, when the earth of the pots is warm, proceed to prick the plants therein, raising them carefully out of the seed-bed, &c. with the fibres of their roots entire; then forming a hollow in the middle of the earth in the pots, place three or four plants horizontally at equal distances in each pot with the roots toward the middle, earthing over the roots and stems quite or almost to their seed-leaves, shaking the pot gently to settle the earth close; if the earth is dry, give a very light watering with water that has stood a few hours in the bed in bottles, to take off the chill; then directly plunge the pots to their rims in the earth of the bed, being careful that every part of the dung within the frame is covered with earth &c. to restrain the steam from rising immediately from the dung upon the plants; for the rank dung steam, when not meliorated by first passing through the earth, would prove their destruction.

In two or three days at most, they will have taken fresh root, and begin to advance in growth, though that is often effected by these plants in less than four and twenty hours, particularly when pricked out at the above age; nor will they then require shading from the sun till rooted, as is often the case with larger plants.

The plants being thus potted out, continue every day to tilt the lights behind, to pass off the steam, and to admit a moderate portion of fresh air, and every night cover the glasses with mats; give also occasional light waterings, and as the plants rise in height, mould up their flanks by degrees; likewise support a due degree of heat in the bed; and in about a month the plants will be arrived at a proper size for ridging out finally for fruiting.

As, in the early culture of Cucumbers, the plants being tender, are liable to suffer by many accidents, it is therefore eligible to continue sowing a little seed in the same bed every week or two, and prick some in pots, as before directed, that, if the preceding plants should fail, these may stand, and will be a ready substitute; or, if the whole should stand, these will do for succession crops, and you will have some to oblige a friend; which is often required in early framing.

But as to the particular culture of these plants, after being potted in this their nursery hot-bed, the following are the principal directions.

During the violent heat and steam of the bed, care is necessary to tilt the upper end of the lights, not only every day, but also occasionally,

occasionally on nights, raising them an inch or two, or a little more or less, in proportion to the temperature of the bed and weather, both that the steam may freely evaporate, as well as for the admission of fresh air, to strengthen the plants, which would otherwise draw up weak and yellow-coloured; but tilt the glasses, however, less in proportion on nights than in the day, observing, in all cold piercing weather, to screen the opening or tilted part of the lights occasionally, by hanging a mat loosely from the top of the glasses, which will break the keen edge of the air and winds from rushing immediately upon the tender plants; likewise observe, that, if the first great heat is so violent as to endanger burning the earth in the pots, the roots, or fibres of the plants, which you ought to examine daily, the remedy is, to raise up the pots a few inches, or as high from the dung as shall appear expedient for the preservation of the plants; and when the vehemence of the heat subsides, they may be plunged again to their rims; observing also, when the heat is moderate, to raise the glasses for the admission of air, &c. only occasionally in the day time, from about nine or ten in the morning in winter and early spring months, till two, three, or four in the evening, according to the heat of the bed, and as the weather is more or less mild and sunny, always shutting down the glasses close before sun-set; cover the lights with mats every evening about four or five o'clock, or a little sooner or later, according to the earliness, or advanced period of the season, and temperature of your bed, &c. uncover each morning about eight, or a little sooner or later, according to the above rules, observing, that during the first greatest heat of the bed, a single mat thick is sufficient covering; but as the heat decreases, augment it to two or three, but never let the ends of the mats hang down considerably over the sides of the frame and bed, which would draw up a violent steam, and promote burning, and, at any rate, would stifle the plants, draw them up weak, and occasion them to assume a yellow hue.

Water in moderate sprinklings may be necessary once in three, four, five, or six days, as you shall see occasion, by the mould drying in the pots, and according to the heat of the bed, and as the weather is more or less sunny; observing that sunny days are to be preferred for the application of this element; and during the winter and early spring months, from about eleven to one or two o'clock is the proper time of day to perform the work; the water for which purpose should be soft, i. e.

either pond, river, or rain-water, and should either be previously placed in bottles within the frame of the hot-bed a few hours, just to take the chill off, or prepared to a proper temperature, by warming a little over a fire to mix with the rest, but by no means let it be warmer than just to take off the sharp chill.

According as the shanks or stems of the young plants rise in height, add a small portion of fine dry earth round them, repeating it occasionally till the vacant space in the top of the pot is filled, being careful to have some fine rich earth in the frame to warm for this use, adding it by degrees, and the plants will emit roots all the way along their shanks, as far as they are thus landed up, which will prove of no inconsiderable advantage to their growth.

In regard to the heat of the bed, it must all along be preserved in a due temperature by proper linings of hot dung round its sides. But, in the first place, in a week after the bed is made, when the vehement heat abates, it is proper to lay some dry straw, long litter, waste hay, or dry fern, around the sides, near a foot wide, and as high as the bed, and a little way up the frame, which will prevent driving wet, and piercing cold winds from penetrating, to chill and occasion a sudden decay of its heat.

But when the heat begins naturally to decline, which in a small bed often happens in about a fortnight or three weeks after it is made, the straw, &c. must be removed, first from the back, and then from the front of the bed, substituting in its stead a lining of well-prepared hot dung, working it about fifteen or eighteen inches wide at bottom, sloping it gradually upward, and raise it three or four inches higher than the dung of the bed, to allow for settling, covering the top with two inches depth of earth close up to the sides of the frame, to preserve the heat, and keep down the steam, which might enter the frame when the glass is opened to give air, and injure the plants; for all rank steam, coming directly from the dung upon these plants, will scald and destroy all the leaves it encounters in its direction: this dung lining will revive the declining heat of the bed, and continue your plants in a healthful growing state. In ten or twelve days after, you may line the other sides of the bed, if it shall seem necessary; otherwise defer it longer; and if the season should prove very wet or snowy, lay some dry litter around the frame, upon the top of the lining, to shoot off the water.

In the course of lining the bed, have a watchful eye against burning or steaming your plants, as a fresh dung lining often promotes a new violent heat and steam; you must therefore observe the precautions above hinted, of raising

raising up the pots of plants, if necessary, and tilting the light in proportion.

As the plants, when first potted out, consisted only of the two seed-leaves, or cotyledons, they, in a week after, will begin to push from their centre the first proper or rough leaf; and in a few days after that, the second rough leaf will advance, inclosing in its bosom other younger leaves, and the end of the first advancing runner appearing like a small bud, which in a few days should be stopped, i. e. taken off, to strengthen the plants, and promote lateral fruitful shoots.

The operation of stopping should be performed when the second of the rough leaves has expanded the breadth of a shilling; it is a sort of pruning performed by taking off the end of the first runner, arising, as above hinted, at the base of the second leaf; and is a requisite operation, both to strengthen the plants, and to promote their putting forth lateral runners, to fill the bed with proper bearing vine; for the lateral shoots are the principal bearers to be depended on: let therefore the said small bud, the end of the advancing runner, be carefully taken off almost close to the base of the second leaf, but never suffer more than the third rough leaf to advance before this is done; and, if performed when the bud or end of the shoot is not bigger than a large pin's head, the better; and by this early stopping the plants at the first or second joint, they will grow robust, and soon prepare to send forth fruitful runners, showing fruit probably at the first or second joint; but if the first shoot was not stopped as above, it would sometimes advance two or three feet in length, without either sending forth side runners, or showing fruit; for the fruit are always principally to be expected from the lateral runners.

Ridging them out in Frames finally to remain for Fruiting.

When the plants have two or three rough leaves near three inches broad, and the operation of stopping at the first joint has been performed, as above directed, they will be in excellent order for ridging out, as they will then be just preparing to emit runners.

Provide therefore, in due time, dung for making the fruiting hot-bed, the quantity proportioned to the number of lights which you intend to work, allowing, if early, a cart-load, or about ten or twelve good barrow-fuls, to each light; on this occasion your care is requisite to have it of proper quality, as before observed, by mixing it well together in an heap (see HOT-BEDS); but in your proceedings you must with forecast make the necessary allowance for the time of the dung's working, and

the bed coming to a proper heat, that the plants, when ready, may not wait for the bed; this premised, and the dung being prepared, stake or mark out the place for the bed frontways to the south, the width and length in proportion to the dimensions of the frames, and number of lights to be employed, making allowance for the bed to be two or three inches wider than the frames; and, when more than one range of hot-beds are intended, one before another, allow a space of six, eight, or ten feet between bed and bed, for lining, &c. the dimensions being thus staked out, wheel in the dung, and proceed to make the bed, first shaking some of the most strawy dung along the bottom; and then mixing long and short regularly together, carry on the bed evenly, building the sides straight and upright, the middle perfectly full, and form every part equally close and firm, by beating it evenly down with the fork from time to time as you advance, not treading it, unless the dung is very long and strawy indeed, raising the whole three feet six inches high, at least, if early in the year; otherwise a yard in height will be sufficient, especially if any considerable range for two, three, or more frames; but if for a three-light frame only, and made any time before April, make it the full height of three feet and half, before mentioned, as it will settle near a foot in less than a fortnight; observing, that of whatever substance the bed, always raise it rather highest behind an inch or two, finishing the work by shovelling up all the short dung remaining round the bed at last, and lay it at top in a ridge along the middle, which, after the bed settles, may be levelled as you see occasion; for it will be a week, ten days, or a fortnight, according to its substance, before it acquires its full heat, and is become moderate enough for the plants.

But as soon as the bed is made, I advise to set on the frame and glasses, being necessary both to defend the bed from great rains, and to forward it sooner to a proper degree of heat for the reception of the plants; observing, when the heat rises, to prop up the lights, to give free vent to the steam, at the same time thrusting a long stick or two into the bed, that by pulling them out daily, and feeling the lower part, you may readily judge of the working of the bed, from its first heat, till it gradually increases to its greatest height of vehemence, and thence till it becomes of a temperate degree, which, in a middling bed, is sometimes effected in a week or ten days; but when of a more considerable range, for two, three, or more frames, it is often near a fortnight, and sometimes more, before the

heat becomes temperate enough to receive the mould and plants, which must not be trusted in the bed while the heat is violent, i. e. so hot that you cannot readily bear your finger in it any considerable time; for it would both burn the earth and roots of the plants, and, if it even only burns the mould, the plants can never thrive; do not, however, suffer the heat to become too moderate before you put in the plants, for it is necessary there be a brisk heat to set them a-going at first, and in continuation.

When the bed, therefore, is become of due temperature, prepare to mould it, previously observing, that, as the bed generally settles unequally, it is proper, first to take off the frames, and level all inequalities, and smooth the surface with the back of the spade, and directly set on the frame for good; then proceed to earth the bed, first laying a small hill of earth on the surface just under the middle of each light or glass, and a pot of plants to be set in each hill; but previously, if thought expedient, the better to secure the earth, immediately under each hill of plants, from burning, you may, where convenient, lay a stratum of moistish cow-dung, not too wet, on the surface of the bed, just under the centre of each light aforesaid, about fifteen or eighteen inches diameter, and an inch thick, spreading it close and smooth; this done, proceed to mould or earth the bed. Let the earth be rich, light, and moderately dry, as formerly mentioned; then, under the centre of each light, upon the stratum of cow-dung, lay about half a bushel of the proper earth, forming each parcel into a sort of conical hillock ten or twelve inches high, at the same time covering the rest of the bed, between and round the hills, with the same sort of earth three inches thick; in each of these hillocks of earth you are to set one pot of plants, as hereafter directed, and the rest of the bed is to be afterwards moulded up by degrees to the height of the summit of each hill.

The reason for forming the earth in hillocks is, that if the bed should discover any tendency to burning after the plants are ridged out, the vehemence of the heat and steam will more readily pass off between the little hills, than if the bed was at once earthed all over to its proper depth; besides, by forming it in hills, if the earth should be in danger of burning, by removing some around near the bottom, to reduce the substance of the heaps, the steam will more easily find vent, and if the earth should unavoidably burn at the base of the hillocks, the burnt earth can be more easily removed, with less danger of

disturbing the plants, and, at the same time, be replaced, with fresh mould; likewise, by this practice, you may venture to ridge out your plants several days, and, in some beds, a week sooner than if the bed was to be at once fully earthed; and likewise, by adding fresh earth by degrees round the hills, it greatly encourages the radical fibres of the plants.

But to proceed to planting—The bed being earthed, as above directed, immediately put on the glasses close, and by next day the bed will have imparted a proper warmth to the mould for the reception of the plants; having directed them, in the nursery-bed, to be potted, three or four plants in each pot, allowing one pot of plants to each of the above hillocks of earth; but previous to transplanting, let each pot of plants be watered a few hours before, that the earth may adhere firmly in a ball about their roots; then, proceeding to turn them out of the pots, spread your hand on the surface of the mould, passing the shanks of the plants between your fingers, and turning the pot upside down, strike the edge gently on the frame, and the plants will readily come out with the whole ball of earth entire; then, making a wide hole in the middle of the hill of earth, place the plants, with the entire ball about their roots, therein, drawing the earth close round, and about an inch over the top of the ball; and if the earth is moderately dry, give a little water that has the chill taken off, and, as soon as they are planted, shut down the glasses close, to draw up the heat, observing, if the sun should shine out, and it occasions the leaves of the plants to flag, indulge them with occasional shade; but, by care in transplanting them from the pots with the entire ball about their roots, they will scarce feel their removal, so as to shrink their leaves at the approach of the sun; if they, however, flag considerably, shade them with a thin mat, from ten or eleven to two o'clock, the first three or four days, or till they take root so firmly as to stand the sun without flagging.

The plants being now ridged out, great attention is necessary to allow them a daily and proportionable share of fresh air, by tilting up the lights behind occasionally; likewise to cover the glasses every night with mats; particular care is also requisite, at first, to guard against their being annoyed by too much heat or steam, and that they do not suffer by cold or want of heat; occasional waterings are also necessary in moderation; the moulding up the bed round the hillocks by degrees must also be duly attended to, stopping the plants once more, to procure a farther supply of fruitful.

fruitful runners; and, as the runners advance in length, train them at regular distances, together with the care of setting the early fruit, and the due temperature of heat of the bed to be preserved by proper linings, &c.

As to the article air—in this particular your care is to consider not only the state of the bed, but likewise the temperature of the weather, early or advanced period of the season, or if the sun shines, or the air be cloudy, wet, or foggy; and to proportion the admission of air accordingly; observing, that wet or foggy air, even though mild, is more unfavourable to the growth of these plants than frost, provided it is accompanied with sunshine, and that you have proper heat in the bed, to maintain a warmth about the roots of the plants, and to warm the internal air of the frame almost equal to that of a hot-house; and, indeed, great care is necessary to preserve your bed always nearly at that temperature; for the plants are rather of a more tender quality than the pine: let air, however, be admitted daily at all opportunities, when the wind is still, by tilting the lights behind, from half an inch to one or two inches high, as your discretion shall direct, according to the rules laid down for the nursery-bed, making an allowance, as the season and warm weather advances, in the time of day, of beginning to open and shut down the lights; and be still persuaded to occasionally hang a mat over the tilted part of the lights in sharp weather, that the plants may at the same time receive a moderate share of air, and the steam pass off without injury; for if the cold air is too freely admitted at an early season, it will frequently destroy, or greatly injure the plants; and if the lights are kept too close, so as to confine and stagnate the steam, the danger will be equal, the plants will imbibe an infected air, and soon show their sickness by the yellowness of their aspect: when there is a considerable heat and steam in the bed, air should always be admitted the most freely, even sometimes on nights in a small degree, as observed of the nursery-bed; and in sunny weather air is to be admitted more freely than in wet, foggy, or cloudy days: in the whole observe, that as there are often several changes of weather in a winter's day, and even early in spring, your attention must be given accordingly, to admit either more or less air, or none at all, as you shall judge necessary for the benefit of the plants; and as sometimes when the glasses are tilted for the admission of air, &c. the weather suddenly changes sharply cold, cloudy, and foggy, should attend accordingly to shut the glasses closer or quite

close, as it may seem requisite: being careful, for the general part, after the great steam has subsided, to shut down the lights always before sun-set; or, if the weather changes very sharp, foggy, or cold driving wet, let them be shut down an hour or two sooner: thus continue your attention in respect to the admission of air, observing, with this care, the lights are to be continued constantly over the plants until almost Midsummer, not omitting, as the warm weather advances, to tilt them high enough in proportion; and as the heat of each day increases, from morning to noon, tilt them gradually higher, one to two inches or more, in proportion to the power of the sun.

Covering the glasses on nights with garden-mats, &c. must be constantly practised every evening about sun-set, or a little sooner in very cold cloudy weather, uncovering again in the morning about sun-rising, or a little before or after, according to the temperature or heat of the bed, or as the weather is more or less favourable; and in fine, warm, sunny mornings, always uncover as soon as the sun shines freely on the frames, for it is very beneficial to the growth and prosperity of the plants, to enjoy as much day-light and sun as possible. As to the mode of covering, use only a single mat thick at first, augmenting it to two or three occasionally, and never suffer the mats to hang down much over the sides of the frame, which would draw up a great steam, and stifle the plants too much, as observed of the nursery-bed: by these rules the covering must be continued every night until June.

The state of heat of the bed should daily be examined the first week or fortnight after the plants are ridged out, lest it should increase again so violent as to endanger burning the earth at the bottom of the hills, as well as the roots of the plants; by examining the bottom of the hills, the burning, if any, is generally discoverable, by its having sometimes a whitish, mouldy appearance; this must be taken away with great care, before it increases upward to reach the roots of the plants, and, if possible, without disturbing them in growth, immediately adding in its stead a proportionable quantity of fresh earth, keeping the bottom of the hillocks in as narrow a compass as possible, till the danger of burning is past, which will be in a few days; but if the heat still threatens danger to the plants by its violence, make wide holes in the sides of the bed, by thrusting large stakes into the dung in different parts, at which holes the burning heat will evaporate in steam, without ascending to the top, closing the holes again in two or three days with dung.

The moulding or earthing the bed between the hills should be commenced as soon as the heat becomes moderate; therefore, in a week, fortnight, or three weeks, as you shall judge the danger from burning is over, lay in some fresh earth, to be added gradually around each hill of plants, for their fibres will now advance considerably, and striking into the fresh mould, it will greatly encourage them; but observing this precaution, that the earth for this purpose should be previously laid a day or two, towards the sides and ends of the bed within the frame, to acquire a due warmth before it is applied round the hills, which otherwise would chill the fibres; and let it be understood, that this mould is not to be laid all on at once in the frame sufficient to earth up the bed fully, but at different times at some days' interval, till the whole is earthed to the height of the tops of the hills; so that the whole bed will be now eight or ten inches depth in earth.

With regard to preserving the due temperature of heat in the bed, let it be observed, that, as soon as the first great heat and steam subsides, it will be of utility to apply a layer of dry long litter, or straw, waste hay, or dry fern, around the bed and frame, especially in early work; it will defend it from the inclemencies of weather, by preventing violent or driving rains, snow, or sharp cold, penetrating winds, or severe frost, from insinuating into the interior part of the bed; and by these precautions the heat will be continued in fine order till it begins naturally to decrease, when a substantial lining of hot dung must be added to one or two sides of the bed, as ordered for the nursery-bed, and as hereafter directed in its proper place.

In respect to watering—a moderate sprinkling will be necessary about once a week or ten days, though in sunny, warm weather, it is probable twice in that time will be requisite, or oftener, as the warm weather advances; chusing, in winter and spring, always a warm sunny day, any time from ten to two o'clock, for this operation; but, as the warm season advances, be more early in the day, and increase the quantity of water, being careful, in cold weather, to have the chill taken off, as hath been already directed for the nursery-hot-bed; observing, that early in the year it is not proper to water too freely all over the plants and young fruit, especially when there is but little sun; but rather give the water mostly between the vine, out of the spout of a small watering-pot, placing a piece of tile, or oyster-shell, to water on, to prevent the mould from being washed from the fibres, so

removing it to different parts of the bed; but, in fine weather, water should also be given now and then moderately all over the leaves of the plants, which will prove a considerable refreshment to them. At each time of watering, in either method, always shut down the lights for half an hour, or an hour, particularly in the winter and spring waterings. When you at any time water all over the plants, observe, if the sun should then, or soon after, shine out with much force, give a slight shade of a mat over the glasses an hour or two, lest, by its power through the lights, it scorch the leaves where the drops of water adhere to their surfaces; but when the season is so considerably advanced, that the sun is powerful, the general waterings should be performed in a morning before nine, or in an afternoon about three, four, or five o'clock, when the heat of the day is past.

Having, when the plants were in the nursery-bed, directed their first pruning, called stopping, if that operation was then omitted, it must now be done the first opportunity, according to the former directions.

The plants being thus stopped, they, in ten days or a fortnight, will each send forth two or three lateral shoots or runners, observing, that when these have advanced two or three joints in length, if they do not show fruit, a second pruning should take place, by stopping each such runner at the third joint; this will promote their putting forth each about three fruitful runners, i. e. such as will probably show fruit at almost every joint; for it is from the lateral or side runners, acquired by the first or second stopping, we are principally to expect the fruit, as you will see by observation, though, in good kinds, it frequently happens that the runners produced in consequence of the first stopping, show fruit at the first or second joint, which is a particular advantage in early crops. According as the runners advance, conduct them along in regular directions, at equal distances from each other, fixing them in their proper position, by gently pegging them down to the earth with small hooked pegs, which you will repeat occasionally during their advancing growth, and they will soon spread all over the bed.

In two, three, or four weeks after ridging-out, the plants may be expected to show fruit, though sometimes that is effected in a week or less, and perhaps at the first or second joint, when the plants are not more than five or six weeks old; and I have had fruit show at the first joint, a day or two after ridging out, in the beginning of February, as big as a small barley-corn, and cut the same fruit for

for the table before the month was out; for the great article at an early season is, to secure and forward the first-shown fruit to maturity, which, without a peculiar mode of culture, will turn yellow, and drop off in their infant state.

When the plants therefore show fruit, particular attention is necessary, for one thing, to the keeping up a moderately brisk and regular heat in the bed, by proper linings, &c. for a great deal depends upon this, that the plants may be continued in a state of free growth, whereby the infant fruit will advance freely, and flower strong; and the next thing particularly to be observed, is, always to perform the office of setting or impregnating the young fruit, according as they come into full blossom, by injecting the farina of the male flowers, as hereafter directed, for the male flowers most commonly accompany the female or fruit blossoms sometimes at the same joint, or in different parts of the same plant; so that by practising this, and if a good heat is preserved in the beds, with the due admission of fresh air and moderate waterings, the fruit will set and swell freely, so as to acquire a due size for the table, probably in ten or twelve days, or a fortnight at most, after performing the impregnation; and, if you began about Christmas, or soon after, the first fruit, with proper management, will be ready early in March, or sometimes sooner; and from the same bed a regular succession may be obtained till Midsummer, or longer.

In respect to lining the bed—this may probably be requisite in three weeks or a month, or little more or less, after it is made, but this is according to the substance of the bed; examine, therefore, carefully, when the heat begins considerably to abate, and, on discovery thereof, lose no time, but prepare to line the back part as soon as possible, for the success of early work depends on keeping up a constant regular heat; having therefore hot dung in due readiness, by previously working it in a heap, as formerly directed; then removing the layer of litter, if any was applied round the sides, first, from the back part of the bed, and against which apply the dung lining fifteen inches or a foot and half wide, and as high as the dung of the bed, or rather half a foot higher, to allow for settling, for the lining ought to be substantial, otherwise it will not have the desired effect; observing, if the heat of the bed is considerably declined, you may also line the front, otherwise it will be better to defer it a week longer; and, in ten or twelve days after that, you may shake up the first lining, adding thereto a little fresh dung, which will greatly

revive its heat, observing also the same of the front lining; and by thus alternately making and renewing the lining, you may preserve a fine growing heat in the bed till June, when, by the nature of the season, the plants will succeed without farther aid of artificial heat, though it is necessary to allow them the shelter of the frames and glasses until the middle or end of that month, or even till that time in July, to preserve the plants longer in plentiful bearing, if required.

At each time of lining, do not omit laying two or three inches of earth at top, to restrain the rank steam of the dung, which would rise and enter the frame at the smallest hole or crevice, or at the opening of the lights designed for the admission of air.

Observe, likewise, that as a fresh lining always causes a very copious steam, and sometimes a strong heat, due attention must be given to tilt the glasses in proportion.

And when you renew the lining for the last time in the end of April, or in May, lay six or eight inches depth of earth on the top, at the same time raising the frame at bottom, that the earth of the lining and bed may join, so as the radical fibres may shoot into the new earth; it will greatly encourage the roots, add fresh vigour to the plants, and will sufficiently recompense you for the trouble.

With regard to the work of impregnation, or setting the fruit, above-mentioned—it is a most necessary operation of art incumbent on the gardener in the early culture of these plants while wholly confined in frames, and the operations of nature in the impregnation in a manner excluded; and should be done according as the flowers, both male and female, come into full bloom, and is performed by injecting the farina of the male into the stigmata of the female blossom, which is as necessary to the generation of plants, as the seed of animals is to their respective species. In hermaphrodite plants, the male and female organs are included all within the same flower, and consequently the impregnation is readily effected by nature; but all the species of *Cucumis* being monoecious plants, male and female flowers distinct, both, however, on the same plant, the male blossoms furnished with the stamina, having their antheræ loaded with a golden powder or farina, is designed by nature to impregnate the females, so that the conveyance of this male powder to the female flower, either by nature or by art, is absolutely necessary, as, without its aid, the young fruit will constantly turn yellow, and drop soon after they have flowered. In summer, when the plants are fully exposed, the gentle breezes

breezes of wind, as also the bees roving from flower to flower, having the farina adhering to their legs, and some other accidental means, are supposed to convey a sufficient portion of the farina for fecundating the females; but in winter and early spring, when no wind nor bees, &c. have free access into the frames, there is a necessity of performing the impregnation by art to these plants in particular, by carrying the male to the female blossoms; and the following is the method.

On the day the flowers of both sexes fully open, or the day after at farthest, is the proper period for performing the operation; the male blossoms are with facility distinguished from the females by the rules already observed; therefore, at the period of growth just mentioned, gather some of the best male blossoms, and apply their antheræ to the stigmata of the females; in performing which, some whirl them down over the female flower, so striking them with the fore finger, to cause them to discharge the farina; but the most certain method is this:—having gathered the male blossom with the shank or stalk thereto, pull off the petal or corolla carefully from about the stamina and antheræ; then taking the shank of the flower betwixt your finger and thumb, apply the antheræ, or top of the stamina, to the centre of the three stigmas of the female blossom, and twirl it about two or three times, that it may discharge or inject a due portion of the *pollen* or farina, into the said stigmata or female organs, and then cast it away, using a fresh male blossom for each impregnation, unless the males are scarce, as sometimes is the case early in the year, when one male with care may be made to impregnate two or three females, as it also sometimes happens at an early season, that a fruit-blossom opens, and no males forward enough on the plants; in this mortifying circumstance you must have recourse to your neighbours, some of whose plants may probably be on the contrary extreme. Some in performing the impregnation, insinuate the anthera of the male betwixt the stigmata of the female, and so leave it there till it naturally drops out; and sometimes they twist the top of the female corolla together to keep the other part in; but all this is unnecessary practice: as before directed, cast the male part away as soon as you have performed the operation, which if well executed, and there is a good heat in the bed, the young fruit will make amazing progress in a few days, advancing with the flower at its extremity; and when from about four or five to six or eight inches in length, is fit to cut for the table.

Always make it a rule, during the early season, to set every promising fruit, according as they come into blossom; and the critical moment is the early part of the first day the blossom opens, or the second, at most; being careful never to water too freely over the newly-set fruit, especially at an early season.

Sometimes, to increase the growth of the newly-set fruit, may stop or take off the end of the runner on which it is situated, at the first or second joint above; it may be practised to some of the earliest; but too frequent stopping occasions a great number of weak shoots, and a confusion of vine.

The importance of the above operation is so essential in the early culture of Cucumbers, that it should never be omitted, as by the practice you may always make sure of the first, and every fruit that shows, whereas, without this care, if the culture of the plants is ever so well conducted, very little fruit will set till late, as by many is experienced.

There are, however, no other plants of our gardens that requires the gardener's assistance in the above work of generation, besides Cucumbers and Melons, and these only in their early culture, under frames, or in hot-houses, where the free air, and other means, by which the fecundating function might be naturally performed, is not obtained.

The male blossoms, so essentially necessary in the above culture, are by the ignorant termed false blossoms, and are often pulled off; but this should never be done at any time of the year, either in hot-beds, or in the full ground, except, indeed, where they grow in great clusters, in which case they may be thinned off, leaving sufficient for setting the fruit: and, likewise, as the blossom in general fades, it should always be cleared away, especially in early frame culture.

As these plants generally extend their vine or runners considerably all over the surface of the bed, quite to the sides of the frame, frequently sending forth runners from all their joints as they advance, insomuch as sometimes to occasion a great confusion of vine; in that case, if numbers of weak, long-jointed, fruitless shoots, are produced, it is proper to thin them out occasionally, cutting them off close; and where the runners in general are considerably crowded, thin out also the weakest, most irregular, and the fruitless stragglers, so training the main vine, and principal bearing side-runners, in a moderately thin and regular manner; for when the bed is greatly crowded with vine, it, by excluding the necessary influence

fluence of the benefit of the sun and air, occasions numbers of the young fruit to drop off in their minority; observing, however, that the regulation of the plants, as above, should, if possible, be begun before the vines are much entangled with each other: clear off also all worn-out or decayed runners, likewise all decayed leaves, and thin the large clusters of male blossom, and pick them off in general when they begin to decay.

When the season is advanced, and the sun shines with great vehemence through the glasses, it is proper to give occasional shade of single mats, or a little loose litter, an hour or two, in the middle of such scorching sunny days; otherwise, the violence of the sun through the glasses might scorch the leaves of the plants.

As the summer advances, and the days grow long; the sun powerful, and the air mild, afford your plants a large portion of air, by tilting the lights one or two inches to almost a hand's breadth high, in the heat of the day, which should be particularly observed in very hot calm days in May and June; or may shove the glasses proportionally open; and in very scorching weather, the occasional shade of a single mat, or a little loose litter strewn over the glasses, during the fierce sun, from eleven to two o'clock, is necessary, lest the violent heat through the glasses scorch the leaves and fibres of the roots; at this time do not let them want water, once, twice, or three or four times a week, according to the heat of the weather: observe, likewise, at this time, if the leaves of the plants are grown so large and high as to press against the lights, it is advisable to raise the frame at bottom about three or four inches, by placing a brick, &c. under each corner, making good all irregularities of the earth of the bed occasioned by this work, filling up also, at the same time, with earth, between the mould of the bed, and that at top of the lining, for the fibres to strike into, as formerly hinted; and if the leaves of the plants are very large and crowded, let some be cut out, so as to admit the air freely: likewise, when the summer is advanced to the middle of June, if the weather is warm and settled, the frame may be raised so high at bottom, as to admit of the end of the plants being trained from under, upon the top of the lining, being careful to cover them on nights with mats the first week after training them out, till hardened to the open air; and towards the end of that month, or beginning of July, may gradually expose the whole to the full air to take their chance for the remainder of the summer; though, if you would continue them in bearing

as long as possible, it is proper to continue the glasses, and especially on nights, and in all excessive wet weather.

Thus far is principally the whole culture of Cucumbers in frames, according to real practice, from the sowing of the seed till the maturity of the fruit for eating; and, as the early culture is to many the most difficult task in gardening, and often attended with bad success by not being generally understood, nor has been sufficiently explained on former occasions, we have now enlarged the more on this head.

But before we quit this article of the frame-culture, we would just add, as a necessary hint, that, in your proceedings in early work, never depend entirely upon your first sowing and planting, but continue sowing a little seed occasionally, both in the seed and nursery hot-bed, and in the fruiting-bed, after ridging out, either in pots, or in the earth of the beds; so pricking some in pots, as directed before, and plunge them in the earth towards the back of the frame; and by having them of two or three different degrees of growth, they will be ready, in case the first plants should not thrive, or that they are cut off by any accident, as steaming, burning, cold, &c. and some will also be ready for succession crops in new hot-beds, for it is necessary to have at least two different crops in frames, one succeeding the other; and, in either case, it is always good culture to keep up a sufficient stock; if more than wanted, the better, as you will have the pleasure of assisting a neighbour with a hole or two, for which there is always great request in the spring season.

The raising or planting Cucumbers in frames may be practised, occasionally, any time from Christmas, as before observed, until the middle of May; though, after the middle of April, the plants will succeed in hot-beds, under hand or bell-glasses, which is the common culture for the later summer crops, that come in to bearing in June and July, and for which crops you may save the expense of frames, except, however, you have spare frames and lights, when they will, even for these crops, be preferable to the hand-glasses.

The necessary quantity of framing to work for the supply of a family is—for the early crop, if for a small family, a two or a three-light frame may be sufficient for the fruiting-bed; but for a large family, three such frames, at least, will be requisite for the first crop, and full as many for the succeeding one.

Their Culture under Hand or Bell-Glasses.

When intended to raise Cucumbers in hot-beds, under hand or bell-glasses, the seed should be sown about the middle or latter end of March,

March, and the plants will be ready to ridge out about the middle or latter end of April, or first or second week in May, which periods are as soon as these plants will succeed under these kinds of glasses, and in which they will arrive at full bearing in June and July.

The long green prickly is the most eligible Cucumber for this crop; some of the green and white Turkey kinds may also be sown for variety, as also any of the other sorts; but let the first mentioned be preferred for the main crop.

The merit of hand or bell-glasses in the culture of Cucumbers is, that, for a general summer crop, it saves the expense of frames and lights, as a crop of Cucumbers, to come in for use part of May, all June and July, may be obtained by planting, at the above-mentioned time, in hot-beds, under these glasses, without the aid of frames; so that persons not accommodated with frames and lights, for earlier hot-beds, or who have them all employed in the early Cucumber or Melon beds, which cannot possibly succeed without their protection, may, for the summer crop, as above hinted, have recourse to the hand or bell-glasses, at the proper period, April and May; therefore these glasses, at the afore-mentioned time, being placed on moderate hot-beds, you may either sow seed under them, or put in plants, but the latter is greatly preferable, having them previously raised in a nursery-hot-bed, hereafter directed, till in the rough leaf two or three inches broad; and, being then ridged out, four plants under each glass, in the middle or latter end of April, or in May, they will fill the glasses with their vine, by the time the weather is warm enough, in the beginning of June, to admit of their being trained out from under them; for the vine must have scope to run, as they will not succeed if too much cramped within the compass of a hand or bell-glass; for which reason, it will not admit beginning to ridge out earlier than the middle of April, lest the plants grow too large for the glasses, before the weather is warm enough to train them out; however, in default of other conveniences, you may sow some seed in the end of March, or beginning of April, under hand-glasses, not, however, where they are finally to remain, especially if before the middle of the last-named month, but rather, if possible, in a sort of nursery hot-bed, made for one or more of these glasses, to raise the plants to the size before mentioned for ridging out at the proper time; but in default of plenty of hot dung, or plants, &c. may sow the seed at once in a final hot-bed, under these glasses, eight or ten seeds

in each, any time from about the beginning or middle of April to the middle or latter end of May, thinning the plants to four in each hole; and even by this practice of raising them, they will be only two or three weeks later, and will have fruit a month sooner than such as are raised from seed sown in the natural ground in May or the beginning of June, which rarely arrives to a bearing state before August.

But the most eligible method for raising plants for the hand or bell-glass crop is, in March afore said, or very early in April, either to sow the seed in any Cucumber or Melon hot-beds already at work under frames, or where there is no room for this in those beds, or that no frame beds are at work, make, about the middle, or toward the latter end of March, a hot-bed for a frame of one, two, or more lights, according to the quantity of plants required, observing nearly the same rules in making the bed and sowing the seed, as directed in the frame culture: likewise prick the plants, when in the seed-leaf, either in pots, or at two or three inches distance in the earth of the bed; but, for the greater convenience of ridging-out the plants with balls of earth about their roots, it is more advisable to prick most of them in pots, four in each, as observed of raising them for the frames; observe also nearly the same rules for giving air, covering up on nights, giving occasional waterings, keeping up the heat of the bed, and stopping the plants at the first joint, as there directed; and in about three, four, or five weeks, when the plants have rough leaves two or three inches broad, and beginning to shoot, or form the first runner-buds, they are of proper size for ridging-out.

The most proper time for ridging-out under these glasses is from about the middle of April to the middle or latter end of May.

The hot-beds for this ridging-out are to be of hot dung, prepared as advised in the framing; observing, that as the season for this work is April and May, the beds need not be quite so substantial as is necessary at a more early season, allowing, however, if in April, dung enough, if possible, to make the bed three feet six wide, and two feet and half high; though, if not made till May, two feet height in dung may be sufficient, and, at either time, the length of course proportionable to the number of hand-glasses you design to work, allowing them to stand at three feet six inches distance, in one row along the top of each bed.

The ridges or beds are, according to the season, to be made either entirely on level ground, or in a trench fifteen or eighteen inches deep; observing, if you would ridge-out in

In April, that, as the beds will require lining in three weeks, to revive the heat, to carry on the plants till the arrival of warm settled weather in June, it is therefore proper to make them entirely above ground, to admit of lining the whole of each side quite to the bottom; but if you do not ridge-out till May, no linings will be required; and as the ground will then be warm, dry, and free from standing water, it is proper to make the bed in a trench three feet wide, and near half that in depth; so that the bed being above half way in the ground, and the upper part covered on the sides and top with the earth of the trench, the whole will assume the appearance of a ridge of earth; and, by being thus moulded, and all cased over with earth, it will preserve the heat the longer.

On consideration, however, of ridging-out in April, conclude to make the ridge entirely on level ground; therefore stake it out three feet and half wide, and as long as convenient; then wheel in the dung, and work it up regularly straight and upright on each side to about two feet and half high; but if four feet wide, and the above height, it gives a larger scope for the roots and runners of the plants to extend, and will support a more durable heat, and be of additional advantage, for the bed will settle a foot, and there are often many cold nights between this time and the end of May; observing, if more than one range is to be made, they may be extended parallel one before another, allowing a space of three or four to five or six feet between, which may afterwards be occasionally in part filled up, with linings of hot dung and earth, which will prove very beneficial to the plants, finishing each bed, by shovelling up all the short dung at last, and lay it at top.

Having thus made the ridge or ridges, they, in three or four days, will have settled, and the heat arisen; then level any inequalities at top, making that part even and smooth, and proceed to mark out the distances for the plants, and mould the places for their reception; for, as there are no frames to confine the heat and steam, you may always venture to ridge-out within the week; the bed being levelled at top, mark out exactly along the middle thereof the places for the glasses and plants at three feet six inches distance, and lay on each of these places about a bushel of rich earth in a hillock, ten or twelve inches high, and broad enough for a hand-glass; at the same time cover the other parts of the bed, between and on every side the hillocks, two or three inches thick, with the same sort of compost, and directly place a hand-glass over

each hill, shutting them down close to draw the heat up soon; and cover them on nights with mats, and, when the earth is warm, put in the plants.

The next day, or day after, the earth will be sufficiently warm for the reception of the plants; therefore, having previously watered the plants the day before, that the mould may more effectually cling in a ball about their roots; then removing the plants with a ball, and levelling the tops of the hillocks broad enough for each glass to stand, and making an opening in the middle, plant one pot of four plants in each hillock, as before directed for the frames, giving directly a little water, and put on the glasses; and, if the plants flag at the approach of sun, afford them a moderate shade the first two or three days; but if they are carefully transplanted, with balls to their roots, they will not want much shading, and the less the better.

Being now ridged-out, care must be taken to admit fresh air to the plants in the warmest time of every mild day, by tilting one side of the glasses, from about half an inch, to one, two, or more high, according to the heat of the bed and warmth of the weather; but shut down the glasses in due time towards evening, or sooner, if the weather changes cold, keeping them close on nights, and all very cold bad weather; and cover, every night, all over the glasses and ridge, with mats, until June; also occasionally in all hard rains.

Give also occasional moderate waterings, according to the rules exhibited in the frame culture.

In a week or fortnight after ridging-out, when the great heat of the bed will be abated, then begin to earth it by degrees all over, to the height of the hillocks, which will encourage and preserve a due heat about the root fibres of the plants; and if previously a wreath of large straw-bands, made of any kind of long litter, is placed round the edge of the bed, just on the top of the dung, fixing them thereto about six inches high, with long sharp-pointed sticks thrust into the bed, it will support the sides of the earth, so as to admit of moulding the bed to its full width, and will preserve that part of the mould from being dried too fast by the sun and winds.

Towards the middle of May, or sooner, if the heat of the ridges abate, and the nights continue cold, a lining of hot dung to both sides of the bed will be of very great advantage; make this fifteen or eighteen inches wide, beating it firm on every part, raising it three inches higher than the dung of the bed, to allow for settling, and immediately earth it at

top with rich earth to the thickness of that on the ridge; this lining will be most serviceable in a triple degree; the fresh dung will revive the heat of the bed, the earth at top affords additional scope for the fibres to strike into, and the bed, being augmented in width, gives an opportunity of training the vines regularly to their full extent.

As the days increase in heat, and the plants in growth, admit air accordingly, by tilting the warm side of the glasses in proportion, to harden the ends of the runners gradually, to be trained out from under the glasses, when the weather is become warm and settled.

In the latter end of May, or beginning of June, the plants will have filled the glasses with their runners; they must then be trained out, by elevating the glasses on props: this, however, must not be done too hastily before the first or second week in June, if possible, to retain the plants till that time under the glasses, for we have often very cold nights till the end of May, and sometimes a week longer; therefore, in the first or second week in June, according to the settled temperature of the weather, and advanced growth of the plants, prepare to raise the glasses on every side three or four inches high, on bricks, pieces of wood, or notched sticks, and lead the runners out regularly at equal distances; fasten them down with hooked pegs, to preserve them in proper regularity, and to secure them against the power of winds, observing to continue the covering of mats every night, and also in casual, very rainy or bad weather, for the first fortnight or longer, after they are thus trained out from under the glasses; continue the glasses also over them till July; or, if continued all summer, it will preserve the head or main stem of the plants from injury of weather.

When the runners advance from under the glasses, if some dry reeds, clean wheaten straw, or small brushy or branchy sticks, are spread on the surface of a few holes, or as many as convenient, for the vines to run upon, it will preserve them clean, and the earth from drying too fast; and the fruit will be better preserved from spotting, which often is the case in wet summers, when they lie immediately on the ground.

In hot dry weather, when the vines or runners are advanced considerably, and in fruit, do not omit supplying them with water two or three times a week; though in July, when in full fruit, they, in very dry scorching weather, will need water every day, or even twice in a day, in the morning before eight, and in the evening after four o'clock, giving, at this time, a watering-pot full, at least, of water, to each hole, watering equally all over

the bed to the very outside; and by thus preserving a proper moisture in the earth, during the great heat of the season, the plants will show fruit abundantly, and it will set and swell surprisingly fast to maturity.

As to the operation of setting or impregnating the fruit, as directed for the frames,—this, if you are anxious about having some of this crop fit to cut as soon as possible, may be performed to those that first show whilst under the glasses; but after the vine is trained out into the full air, there will be no great necessity for taking that trouble, for reasons already mentioned.

This crop will continue in bearing from about the end of May, or beginning or middle of June, until the latter end of August, or till September.

But with respect to ridging-out these plants in May, as we formerly observed,—the ridge, or hot-bed, at this time need not be more than three feet wide, and about two feet deep in dung, nor will it require lining; and therefore I should advise to make it great part within the ground, in a trench, the excavated earth of which, if made in any of the kitchen-garden quarters, will serve to mould the bed; mark out, therefore, a trench, where the ground is perfectly rich and light, two and a half or three feet wide, and in length at pleasure; dig out the earth twelve or fifteen inches deep, or not more than a foot and half, if the goodness of the soil will admit, laying the earth in a range close along each side, to be ready wherewith to mould the ridge; and if more than one ridge is intended, make them parallel, and allow a space of four or five feet at least between.

The trench being ready, then wheel in the dung, and spread it regularly to the full width and depth of the trench, raising it, however, if in the beginning of the month, full two feet thick or depth in dung, working the whole along equally in a firm regular manner; and directly mould it all over the top eight or nine inches thick, and mark out the places for the glasses, by placing sticks exactly along the middle, at three feet and half distance, and then trim the rest of the earth of the trench equally up to each side of the bed, close to the earth at top, so as to cover every part of the dung, and form the whole into a broad bed four to five or six feet wide, assuming the appearance of a raised bed of common earth, forming the edges straight and regular: this done, put on the glasses, and, at night, cover the whole with mats, to draw up the heat, and next day, or day after, the earth will be warm; then put in the plants as before directed, give water, and set on the glasses, covering them, and the bed in general, on nights, with large garden-mats; likewise,

likewise, in excessive rains, night or day, at first planting; otherwise much falling wet might chill the bed, being of moderate substance, so as to occasion a total decline of its heat. As to their other culture, it differs not from those ridged out in April, only the bed is not designed to be lined; but in all other respects the same management is to be observed.

Along the edges of the bed may be planted rows of cos lettuce, which will come off time enough for the plants to run.

Another method of ridging-out in this month (May) is, that, in cases of scarcity of hot dung, instead of forming one continued ridge of dung in a trench as above directed, it may be worked in holes, one hole for each glass; dig therefore holes two feet wide, and twelve or fifteen inches deep, and three feet and half distance in the rows; observing, if you design more than one range, allow six feet between each row of holes; then let a large wheel-barrow-ful, as much as a man can wheel, of good hot dung be worked firmly into each hole; earth them directly six or eight to nine inches deep, place on the glasses, and when the earth is warm, either put in seed, or rather plants, if furnished therewith, managing them as before directed; afterwards, at your convenience, dig and work up the earth on each side the rows, so as to form every range of holes into a sort of bed, five or six feet wide, for the vines to run upon; and along the edges of which you may plant rows of cos-lettuce as before observed.

In ridging out Cucumbers in holes, as above, if you place a few holes near a south wall, paling, reed-hedge, or trellis, &c. you may, in June, train the vines of the plants up against those fences, both for the sake of variety, and to improve the size, beauty, quality, and flavour of the fruit; for they are generally larger, more fair and free from spots, more solid, firm, less seedy and watery, than those which lie on the ground.

By this practice you may particularly improve the long green, and white Turkey kinds, &c. or any other varieties.

Or, if you place some branchy sticks, as for peas, about three or four feet high, the plants being of the cirrhous climbing kind, they, with a little conducting at first, will assist themselves in ascending upon the sticks, by means of their *cirrh*i, or tendrils, though, when designed to train these plants off the ground, they succeed best when trained against some kind of fences, either of close or of open work, and free to the full sun.

Raising them under Paper Frames.

In default of hand or bell-glasses, a few

holes of Cucumbers, for private use, may be brought to-bearing in June, under shelters of oiled paper, either pasted on ridged or arched frames, made of lath, or other open work, three feet wide, ten long, and two feet high; or on small open frames the size of hand glasses; or by pasting three or four sheets of strong paper together in a piece, each such piece to cover one hole of plants, previously oiling it, as is directed for PAPER FRAMES; so in the beginning of May, ridging out some plants on a moderate hot-bed, or, in want of plants, sow seed therein, as before directed; then place on your frames directly; or, if you use only the sheets pasted together, as in the latter method, first arch over each hole of plants with two or three pieces of hoops, &c. placed across one another, eight or ten inches high, and place the paper over each arch or hole of plants, laying bricks, boards, or some other substance, to prevent them from being disturbed by boisterous winds; but either of the other methods would be better than this: however, let either of these shelters remain over the plants day and night, till the middle or latter end of June, admitting fresh air occasionally, covering every night during the cold weather with mats; also all times when it rains excessive hard the first three or four weeks after planting.

Under these temporary shelters, by aid of a moderate heat of dung, you may obtain Cucumbers a month or six weeks sooner than any can be raised from seed entirely in the natural ground.

Raising them in Hot-houses.

Cucumbers are often obtained in hot-houses in winter, and early in spring, with less trouble sometimes than in hot-beds under frames, not, however, always with success of such plentiful crops; but as pine-apple stoves are now common in most parts of the kingdom, it is worth trial; and if but a few very early fruit are obtained, they will compensate for the trouble.

The seeds may here be sown any time from October till March; though to have as great a chance as possible, it is proper to sow in October, November and December; but let it be observed, that those sown about Christmas, or soon after, will be considerably the most prosperous and successful crops: let the seeds be sown half an inch deep in small pots of rich earth, that have been previously plunged in the bark-bed a day or two, to warm the mould, retaining the pots therein, and the plants will rise in a few days, which, when two or three days old, prick in pots, as in the frame and hand-glass culture, plung-

ing them also in the bark-bed, giving now and then very moderate waterings; and as to air, they can have it only in common with the other plants of this department; observing, as the plants advance in growth, to stop them at the first joint, as hath been already directed; and when they are just ready to shoot runners, let them be transplanted, with the entire ball of mould about their roots, into large pots or oblong boxes, to remain to fruit, but rather in trough-fashioned boxes two or three feet long, ten or twelve inches width at top, six or eight at bottom, and eight or nine inches deep; having the pots or boxes filled with some best rich light earth, placed in the stove a day before to warm the earth a little for the reception of the plants, which then transplant as above, one pot of plants into each large pot, and one or two into each box, and give a little water: as to the proper situation in the stove for these pots or boxes to remain, they may be tried in different parts; where there is room you may plunge one or more pot half way in the bark-bed; others may be placed on top of the flues, elevating them upon bricks, or some other materials, so as there may be a vacancy of several inches between the top of the flue and bottom of the pots or boxes, both that the heat of the flues may have due vent, and that it may not dry the earth in the pots, &c. too fast; or the pots or boxes may be elevated nearer the top glasses, which is of much importance to these plants for receiving the greater benefit of the sun; and for which reason, if some boxes, or one long trough was erected near the top glasses, it would be of considerable advantage; which might readily be done by iron or wooden brackets, suspended from the cross-bars at top, and the proper place is along under the uppermost end of the sloping glasses, or rather a little behind nearer the back wall of the stove, or nearly over the top of the back flues, fixing them within about fifteen or eighteen inches, or not more than two feet if possible from the upper glasses; in which situation, in this department, I have always observed Cucumber plants, at an early season, to be more prosperous and fruitful than when more distant from the top lights.

When the plants are thus finally planted out in either of the above methods, your care is requisite to supply them duly with moderate waterings as often as it may appear necessary; keeping the earth always moderately moist.

Likewise, when the vines or runners of the plants advance, fix up some neat laths for them to run upon, and to which they must be fastened occasionally as they advance in length.

When they show fruit, practise the operation of setting them, as directed in the frame culture.

In this, the hot-house culture of these plants, different methods may be practised by way of experiment; as that of sowing the seed and pricking the plants in pots, and afterwards transplanting them with balls where they are to remain to fruit, as already directed; or only just raise the plants, as above, till two or three days old, and transplant them into the fruiting boxes; or sow the seed at once in the said boxes, and suffer the plants to remain to fruit; or some plants might be plunged in the ran between the pines, and their vines suffered to run among them.

Try also plants previously raised in pots in dung hot-beds, under frames, till in the second or third rough leaf; then transplant them with balls into pots or boxes in the stove.

Cucumber plants, raised in a common dung hot-bed in September or October, till in the second or third joint, and then transplanted with balls into the stove, will sometimes afford a few fruit in November and December. Or, sometimes layers of Cucumbers of the young fruitful runners in July or August taking root, and transplanted into pots in September, kept in a frame or under glasses defended from cold and excessive rain, and placed in a hot-house in the end of September or in October, will have a chance of producing a few late fruit in the last-named month and November, when the other crops are decayed; also cuttings, as above, taken off five or six inches long, from some healthful, good-bearing plants of the summer crops, in the beginning, or towards the middle of September, planted somewhat horizontally, in the laying order, in pots of rich light earth plunged in the bark-bed, shaded from the sun a week or two and moderately watered, will take root, grow, and sometimes break forth into fruitful runners, and produce some fruit in November and December:—though, in either of the above methods, only a very slender production is to be expected in that season of the year; so may only introduce a few plants by way of trial; and if but two or three fruit are obtained, they will generally be acceptable.

Cucumber plants may be raised in the stove to a proper size to plant out in hot-beds under frames, where they are to fruit for the early crop, which will save the trouble of making a dung hot-bed for sowing the seed and nursing the plants: sow the seed about Christmas in pots, and prick the plants into others, as before directed, and when in the first joint, and beginning to shoot runners, transplant

plant them with balls into the fruiting frames.

Raising them in the natural Ground for Picklers, &c.

The latter end of May, and first and second week in June, is the time to sow Cucumbers in the natural ground for picklers, &c. before which time neither the seed nor plants will succeed in the natural earth, or open air.

This crop succeeds the hand-glass Cucumbers, and comes into full bearing the beginning of August, and continues bearing plentifully until the middle of September, both for picklers and other occasional purposes; but it is from this crop that the general supply for pickling is commonly obtained.

Observe, that although we mention May, or beginning of June, for sowing, it is, however, not every year that the weather is favourable enough to admit of sowing the general crop before the latter end of May; for it must not be done before the weather is become warm, dry, and settled, as, if you put in the seed while cold or very wet weather prevails, or when the ground is cold and wet, it will mostly rot, or, if any plants come up, they will acquire a stunted dwindling growth: and, therefore, should not perform any general sowing, till the season has settled in temperately warm and dry, toward the latter end of May, or beginning of June, as before observed; or in a warm, dry, sheltered situation, may sow several days, or a week sooner, than in a more open common exposure; or where there are any spare hand-glasses, might place them over some holes sown as above, to defend the seed and young plants in cold nights, very wet, and other casual unfavourable weather: however, not to omit the season for sowing the general crop in the open ground, take opportunity of the first favourable settled weather, some time from about the fifteenth or twentieth of May, according to the temperature of the season, to the tenth or twelfth of June, at farthest, for the principal sowing.

The sowing is to be performed at once in the place where the plants are to remain to fruit.

Chuse, therefore, for this crop, a spot of your richest ground, in any of the common quarters, open to the full sun, either a clear, unoccupied compartment; or, where there is a deficiency of vacant ground, may occasionally sow between some particular crops which stand distant in rows, and are soon to come off the ground; as, between rows of early cauliflowers, early cabbages, wide rows of early beans, or in the alleys between onion-beds, particularly those for culling or drawing

off in young growth; or in the alleys between beds of transplanted lettuces, or such like temporary crops, that come off by the time the Cucumbers begin to advance considerably; however, where there is ground vacant from crops in a proper situation, it should be preferred, as the whole can be properly digged, and divided into regular beds.

The order and manner of sowing is—If a clear piece of ground, let the whole be neatly dug, and then divide it into beds five or six feet wide, having a foot-wide alley between bed and bed; then along the middle of each bed mark out the holes or places for the seed at three feet six inches distance; let the earth in each place or mark be finely broken, and then hollow it a little with the hand in a shallow basin-like form, about ten or twelve inches diameter, and one or two deep; then, in the middle part of each hole, drawing a little earth to one side, sow ten or twelve seeds about half an inch apart, and cover them over half an inch deep with the earth.

But when you are necessitated to sow between other crops, as above hinted, you must be content, for the present, only to dig holes in each patch where the seed is to be sown, observing the distance in the row as before, and allow, if possible, six feet between each range of holes, sowing the seed, as already directed, and when the crop comes off, the ground between the rows may be digged, and formed into beds, as before advised.

The crops sown in the above methods, being according to the general successful practice, are designed principally for the vines or runners of the plants to be trained along the surface of the ground.

But as these plants are of the tribe of cirrhous climbers, nature having furnished them with *cirrh*i, or tendrils, to indicate that it intended them also for climbing as well as to trail on the ground; therefore some may be raised in such order, as for their vines to climb upon sticks, &c. in the manner of peas; when this is intended, the seed may either be sown in the manner above directed; or some may be sown in small shallow drills, running north and south, five feet distance, first forming with a hoe or spade a sort of shallow flat trenches a foot wide, and one or two inches deep, the distance as above, and along the middle of each of these shallow trenches draw a small drill a finger's breadth deep, in which sow the seed, and cover it about half an inch with the mould; so, in either of these methods, when the plants begin to run, place to each hole or row some branchy spreading sticks a yard high, whereon to conduct their runners, and on which they will

will also naturally assist themselves in ascending by means of their tendrils, and will produce plenty of fruit, which, by being elevated from the earth, will be fair, firm, and free from spots.

Or, if some seeds are sown on a sunny border close along under a wall, paling, reed-hedge, or any other fence, and on which to train the plants, they will produce handsome fruit, clear, and free from spots, less watery and seedy than those that lie on the ground, and much better flavoured, and consequently preferable both for eating and pickling.

The above methods of sowing, for training the plants upon sticks, or against fences, is principally recommended for practice to a few in private gardens for family use, which would by no means be practicable in large grounds, where great quantities are raised for market.

The seed being, however, sown in either of the above methods, I advise, if very dry and hot sunny weather, to sprinkle the holes every day or two with water; but let this be done very moderately, only just to preserve the earth in a middling degree moist; for, if the earth is rendered very wet, either by watering or excessive rains, the seeds are very apt to rot; preserve, therefore, only a very moderate moistness, and, if the weather is hot and dry, the seed will sprout in a few days; but if the season is very dry, and the sun scorching, the shade of a cabbage-leaf to each hole, to prevent the earth from drying too suddenly, will prove very beneficial to the free germination of the seed, and the plants will rise in six or eight days; at which time you will do well to watch the sparrows, for these birds often devour the seedlings at a great rate, just as they issue from the ground.

But sometimes in sowing this crop in warm dry seasons, in the latter end of May or beginning of June, that if the weather proves excessive hot and dry, so as to parch the earth considerably, may, previous to sowing, chit or spear the seed, by soaking it in water; that is, put the seed in a little warm milk, or soft water, and place it within a hot-bed frame, or under a glass, &c. about twelve to twenty hours, or long enough for it to spear, i. e. germinate or sprout half a quarter of an inch long, which we call spearing the seed; then sow it directly, giving water freely in dry weather, and the plants will often rise in two or three days.

Another method of treating this crop is, that in cold wet seasons, as it sometimes happens, in May or even in June, I would advise, where conveniently practicable, to raise the plants in a slender hot-bed, sowing the seed in little

patches at small distances; and when the plants are about a week or ten days old, just beginning to show the rough leaf, transplant each patch of plants with a ball of earth into the natural ground, in the places where they are to fruit, a patch to each hole; this is an eligible practice in bad seasons, and practised by many of the London gardeners, who sometimes raise plants enough to furnish the allotted space of ground for the general crop; and by that means have much better crops, and come sooner to fruit by a fortnight than when raised in the common way in a cold wet season, as above. The method is as follows.

In the middle or latter end of May, or first week in June, make a hot-bed three or four feet wide, and eighteen inches high, the length in proportion to the quantity of plants required; earth it directly about three inches deep, and sow the seed: the method of sowing is, to dot in the seed in clusters in small holes an inch and half apart, and half an inch deep; that is, either with a short blunt-ended dibble, or with the two first fingers and thumb, contracted at top, dot holes in the earth of the bed the above distance and depth; as you proceed, drop eight or ten seeds in each hole, and when the whole bed is thus sown, immediately cover in all the holes evenly with fine earth: or, instead of dotting in the seed, as above, may draw small drills south and north the bed, near an inch deep, and two or three inches asunder; sow the seeds in the drills in clusters, as before, and earth them over the same depth; but I would rather recommend dotting them in: then, in either method of sowing, either place a frame and glasses over the bed, or let the bed be directly arched over with hoops or rods, in order for covering on nights, and all bad weather, with mats; if the weather, after sowing, should prove hot and dry, give moderate sprinklings of water, and the plants will be up in three or four days; and the seed being thus sown in clusters, the plants will rise also in bunches, which, when they just begin to show the first rough leaf in the centre, are then fit for transplanting in this method; or if cold or unfavourable weather, they may remain a little longer; previously water them some hours before, that the earth may cling to their roots; then proceed to take them up with the point of a hollow or scooped trowel, each cluster or patch separate, and with a small ball of earth, which will readily adhere about the radical fibres, placing the bunches of plants carefully in a flat basket, to be carried to the place of their destination, which should be previously dugged and formed into holes, basin-fashion, as in the common method;

method; break the earth fine, and plant one bunch of plants in the middle of each hole; close the earth well about them, and give a little water, but they will scarcely require shading; for being removed young, and with balls, they will not feel their removal; so repeat the watering occasionally, and the more sun they now have, the better, and they will grow surprisingly; observing, when they are fairly in the first rough leaf, they must be thinned to four of the best plants in each hole, as directed in the general culture following.

As to the general culture of this crop of Cucumbers, raised in either of the above methods, the principal articles to be observed are; that, if dry weather, after they are come up, let them be moderately watered every day or two, at least; and when they have been up a fortnight, or when their first rough leaf is advancing, or not much broader than a shilling or half-crown piece, it is proper to thin them to four or five plants in each hole, reserving the strongest plants at equal distances, and mould up their shanks, pressing the earth gently but closely about them, so as to spread the plants different ways, and give some water, to settle the earth where loosened by thinning out the superabundant plants: if there are deficiencies in any of the holes, make them good with the best of the plants thinned out. After this, continue your care of watering in dry weather; it will be necessary three or four times a week, and sometimes every day, and even twice a day, morning and evening, in July and August, when the weather is excessive hot and dry.

In the beginning of July, when the plants begin to run, let the holes be lightly hoed with a small hoe, to destroy weeds, and loosen the earth; drawing a little mould about the shanks of the plants, press it gently between with the back of the hand, to separate the plants as much as possible from each other, at equal distances, and in the direction you intend they shall run; let the whole surface be also lightly hoed, and if gently loosened two or three inches deep, as far as the plants will extend; it will greatly encourage them.

As the vines advance in length, it will be of much advantage to peg those down which you design to run upon the ground, to prevent their being disturbed by wind; and if some reeds or small sticks are spread for the vine to run upon, which might be readily effected to a few holes in private gardens, the plants will fasten themselves thereto by their clasps, and by keeping the fruit from the ground, it will preserve them from spotting.

Those which are intended to be trained to sticks or fences, should have that work begun when they are advanced near a foot long, and continue conducting the runners thereto occasionally as they advance in length.

Be sure, in dry weather, after the plants are considerably advanced, to water freely, as before hinted; and in July and August, when they come into fruit, and the weather hot and dry, to water every day.

These crops come into bearing the end of July, or principally the beginning or middle of August, and continue fruiting in great plenty till the middle or latter end of September; but after the middle of that month the fruit is often spotty, very humid or watery; therefore, when the fruit is required for pickling, begin gathering for that purpose in August, and continue it a month or six weeks, or as long as the fruit continue fine and unspotted.

For this purpose of pickling you should look over the plants three times a week, to gather all the fruit that are fit; when they are from about two to three inches long, and not much thicker than your finger, they are of proper size for pickling; observing, if possible, to gather them when they are dry and clean, each with a small part of its stalk, and the sooner they are put into the pickle after gathering, the greener they will be, and more firm and crisp to eat, which are commendable properties in pickled Cucumbers.

The necessary quantity of plants to produce picklers for family use, is from about ten to fifty or sixty holes, according to the demand of the family; every ten holes will afford near a thousand picklers in the course of the season, i. e. from about the beginning or middle of August until the middle of September.

Much wet weather is very unfavourable to this crop of Cucumbers; it chills the earth and fibres of the roots as well as the plants, which being naturally tender, they in such seasons neither produce fair fruit, nor a plentiful crop, nor is it of free growth, and the plants continue but a short time in bearing before all the fruit of each gathering will be spotty, and very unsightly to the eye, watery, and ill-tasted.

But in dry warm summers, let them be duly supplied with water, and they will bear abundantly, and the fruit will be fair, arrive fast to perfection, and continue fine till the autumn rains, or long dewy nights, towards the middle of September, chill the earth and plants, when the produce will begin to be both scanty, deformed, and spotted.

Of having them late in Autumn and in Winter.

But if Cucumbers are required in perfection

tion for the table as late in autumn as possible, it is proper to place some frames over a few holes of the best plants in August, and let them be shielded with the lights every night, and all cold wet weather; and thus, by preserving the plants from cold and excessive moisture, they will retain a healthful and moderately free growth till October or beginning of November, producing tolerably handsome fruit.

If the plants are growing on a dung-bed, formerly a hot-bed, I should also advise, towards the middle or end of September, to line it on each side with hot dung, to throw in a little heat, which would be of much advantage; but even if the plants are growing in the full ground, it might be done by digging a trench at the back and front two feet wide, cutting it a little under, so filling it with hot dung, treading it in firmly; and as it settles, continue adding more.

Or, to have late Cucumbers, some might be sown in the natural ground, in a warm situation, the middle of July; place a frame over, and shelter them all along occasionally with the lights; they will come into bearing the end of August, and, with due shelter, will continue longer than those sown a month or two before.

Or, if some seeds are sown in the natural ground the end of July, or beginning of August, and the plants transplanted with balls into a slender hot-bed under frames about the latter end of the last-named month, they will come into bearing towards the latter end of September; and with proper shelter, and occasionally lining the bed three or four weeks after making, they may be continued in bearing a few fruit all October, and great part of November.

And, if some seed is sown in a slender hot-bed, or under glasses, the latter end of August, and transplanted into another of moderate structure in the middle of September, they will arrive to a bearing state in October, and, with care, will probably continue producing a few till December.

If some seed is sown in September, as above, and transplanted into a hot-bed of tolerable substance, under frames and glasses, in October, managing them nearly as the early plants, you may stand a chance of having them produce now and then a fruit till Christmas; and in this bed may also be sown some seed in October and November, &c. to try to extend a crop of plants still farther; there is, however, no great expectations to be formed from either of these crops, the declining season of the year being unfavourable to their growth; and is, therefore, only worth

practising in some family gardens, by way of curiosity, where a fruit or two at an uncommon season may be greatly valued.

But by thus continuing to sow some seed occasionally, from early in spring till late in autumn, many have cut Cucumbers every month in the year.

It is, however, to be considered of all these autumn-raised crops of Cucumbers, that, by the nature of the season, they, if ever so well managed, can never succeed so well as the spring and summer crops; but as a few fruit in October and November, after the general season is past, may be easily obtained by the afore-mentioned rules, it will be esteemed a rarity, and in most families highly acceptable.

Saving the Seed.

To save Cucumber-seed, some fruit either of the frame or hand-glass crops should be left for that purpose; for those of the late crops, in the natural ground, seldom ripen their seed perfectly, unless some of the first fruit of the August production are left for that purpose.

Therefore, about May, or June, or July, mark some of the finest fruit of the frame or hand-glass crops, and those situated near the main stem, that there may be the greater chance of having the plants from that seed show fruit at home, as the gardeners term it, meaning their beginning to show fruit at the first, second, or third joint, which is a principal merit in these plants, particularly the early crops.

But to insure still a greater chance of having early-fruited plants, I advise you to leave one or two of the earliest frame fruit, which appear at the above-mentioned joints of the plant, and this will be choice seed for your early framing, as the plants will seldom fail showing fruit at the beginning of their first runners.

Having, however, marked the fruit for seed in either of the above crops, they must be permitted to remain upon the plants till June, July, or August, according to the forward or late growth of the fruit; observing, those which are produced and left for seed in March, April, or May, will be ripe in June and July; but those produced in May or June will not be ripe till the middle of August, for the seeds ought to be perfectly well ripened.

When they are fully ripe cut them from the plants, and set them up on end against a sunny wall or hedge two or three weeks, or till their outer coat begins to decay; then cut them open, and turn out the seeds and pulp together into a tub or other vessel, to remain
a week

a week or two, stirring it up every day, that the pulp may rot and separate from the seeds; and then add some water, stirring the whole well about with a stick; the pulp will rise like foam to the top, and the seeds will settle to the bottom of the tub; so that by a repetition of two or three waters the pulp will be separated entirely from the seed, which should then be spread upon a mat in the open air a few days, until perfectly dry, when it should be put up in bags or boxes, and preserved in a dry room for sowing.

This seed will support its growing quality eight or ten years, but is in the greatest perfection in the third and fourth years, at which age it is generally productive of more prolific, quick-fruited plants, than younger seed, which is apt to fly vigorously into vine, and show fruit sparingly.

Second Head.

CUCUMIS MELO, the Melon, or Musk Melon, (*Melo*).

The Melon, as we before observed, is, according to the Linnæan system, a species of *Cucumis*, and considerably the most valuable species of that genus, in respect to the excellence of its fruit, which, for deliciousness of flavour and taste, is next in estimation to the pine-apple, the flesh or pulp being both pleasant and grateful to the stomach; and its smell and taste indicate it of an aromatic quality.

Class, order, and characters, the same as the *Cucumis*.

Of the Melon, there is but one real species of the plant; but of the fruit there are innumerable varieties, with respect to figure, size, colour of the rind, and flesh or pulp.

The species is,

CUCUMIS *Melo*.

[*The Melon.*] *Cucumis* with roots composed of numerous, very small, widely-spreading fibres; long trailing stalks, divided into many branches, spreading on the ground, furnished with tendrils; roundish, angulated, rough leaves; smallish, bell-shaped, yellow male and female flowers, the females succeeded by a large, oval, and sometimes roundish fruit, often channelled, or ribbed longitudinally, having a firm, musk-scented flesh, and many oblong seeds included in a watery pulp.

This fruit, in different varieties, is of various sizes, from about four to ten or twelve inches in length and diameter, in most sorts ripening externally to a yellowish colour, and some ripen green, and others white, but they have mostly a reddish flesh or pulp, except one variety, which is green both in rind and pulp, as hereafter described.

The varieties of most estimation at present in the English gardens are,

Common Musk-Melon—A large, oblong-oval, longitudinally-ribbed, and netted-wrought Melon, having a reddish, tolerably rich flavoured flesh; and the plants being of the hardier kind, generally set a plentiful crop of fruit.—This is also one of the best sorts of Melon for mangoes; for which purpose the London gardeners cultivate principally this variety for the supply of markets.

Romana Melon—A roundish, moderately-sized, ribbed, and netted Melon, somewhat compressed at both ends, and with a reddish, firm flesh of a fine rich flavour, the plants good bearers, each often setting from about five or six to eight or ten fruit, and is one of the best sorts, both for an early and general crop.

Cantaleupe, or Armenian Warty Melon—A large, roundish, deeply-ribbed Melon, a little compressed at both ends, and the surface full of warted protuberances, and with a reddish, firm flesh of a most delicious rich flavour, of which there are some varieties—Large Black Carbuncled or Black-rock Cantaleupe Melon, being of a blackish-green colour, having the surface covered with high, rugged, saxatile-like protuberances—Large Green Carbuncled Cantaleupe Melon—Large White Carbuncled Cantaleupe Melon—Orange Cantaleupe Melon—These varieties are the finest of the Melon kind, with respect to the richness of flavour of the fruit, and by the Melon-eaters are preferred to all the other sorts; but the plants being rather more tender, do not set fruit so freely, nor in such plenty, they often not having more than from one to two or three fruit on a plant, and in a three-light frame sometimes not more than five or six fruit, and frequently not so many; as the fruit, however, obtains the highest estimation, the several varieties of this sort are now generally valued for the principal crop in family gardens; observing, that, to preserve these varieties distinct, they should not be cultivated in the same frame with other sorts, nor with each other, for the commixture of farina would occasion a degeneracy; also by saving the seed long in the same garden, the fruit often gradually loses its saxatile or rock disposition, and the surface becomes quite plane, bearing great resemblance to the Romana Melon.

This variety derives the term Cantaleupe Melon, from Cantaleupe near Rome, the place where it was first cultivated in Europe, brought thence from Armenia.

Small Portugal Melon—A smallish round Melon, having a reddish flesh of a fine musky flavour; and the plants are plentiful bearers,

Y y

each

each often setting from eight or ten to twenty fruit, which, however, is more by half than should be left to come to perfection. ♣

Green-fleshed Melon—An oval, moderate-sized Melon, having an even, smooth, green rind, and the flesh or pulp ripening to a greenish colour, and is highly flavoured.

Large Green-rinded Melon—A large roundish-oval, green, smooth-rinded Melon, having a reddish flesh.

Black Galloway Melon—A roundish-oval, middle-sized, slightly-ribbed, dark-green, smooth Melon, having a reddish, rich-flavoured flesh, and the plants excellent bearers, but the sort not at present very plentiful in England.

It was brought from Portugal many years since by a lord Galloway.

Netted or Wrought Melon—An oval, middle-sized, scarcely ribbed Melon, having the surface closely wrought with raised net-work, and hath a reddish flesh.

White Spanish Melon—An oval, smallish, white, smooth-rinded Melon, having a reddish pulp.

Zatta Melon—A very small, roundish, wart-rinded Melon.

Observe, that although all the above kinds be only varieties of the same species, yet, by care in cultivating them separate, they may be continued all tolerably permanent.

There are many other intermediate varieties of less note; but a few of known good qualities are better than many different sorts, some of which are probably not much better than gourds; and of the varieties here specified, the *Romana* and *Cantaleupe* kinds are considerably the most worthy of attention, as these two sorts ripen to a much higher degree of perfection; but the other varieties also ripen perfectly here, and often of a rich and good flavour, though at all times inferior to the two above-mentioned sorts, more particularly the true *Cantaleupe* kind; however, where there are great quantities wanted, and all proper conveniencies, I should advise, for the sake of variety, to cultivate some of each sort; but to give preference to the *Romana* and *Cantaleupe* for general crops.

The Melon plant is an herbaceous annual, and one of the most singular and wonderful of that tribe, if we consider its slender and prostrate growth, trailing upon the surface of the earth, and being but of six or eight months' duration, yet producing fruit of such admirable figure, size, and richness of taste.

It is an exotic from the hot parts of the world, supposed originally of Persia, from which country, however, it was first intro-

duced into the different parts of Europe; and consequently its culture in every part of Britain can be effected only by artificial heat, and constant shelter of glass, &c. till July, as at an early season they require a temperature of heat almost equal to that of our pineapple stoves.

The principal season of ripe Melons in England, is June, July, and August; they, however, by different sowings and plantings, may be obtained from May till October; but they are always in the greatest perfection in the times before mentioned.

The flowers of the Melon are consequently *monœcious*, like the Cucumber, as being of the same genus and class, male and female apart on the same plant, the males standing immediately on the summit of its foot-stalk, without any appearance of germen or fruit, and the females discover the round germen or embryo fruit under their base, when not bigger than a pea; observing, that the male blossoms being by nature designed for fertilising the female flower, as observed of the Cucumber, they must not be pulled off until a full crop of fruit is set.

Observations on their General Culture.

With regard to the propagation of the Melon, the plants being annual, are raised every year from seed, sown at different times in spring, in hot-beds of dung or tanner's bark, under frames and glasses, &c. they requiring continual aid of artificial heat and shelter, from the time of sowing until June or July, for they will at no time succeed in the natural ground, at least rarely perfect fruit; and each crop requires two different hot-beds, that is, to be sown in one, and the plants nursed therein till a month or six weeks old, when they begin to shoot runners, then transplanted into a second and final hot-bed, to remain to fruit.

The season for sowing is any time from the beginning of January until the middle of April, according to the conveniencies there may be for their culture, and time the fruit is required in perfection; for the early crops, to be raised in January, February, and beginning of March, require very substantial hot-beds, under constant shelter of garden-frames and lights, until July; but the latter crops, sown in the middle of March and in April, succeed with more moderate hot-beds; and some may be ridged out in April and May under hand or bell-glasses, or oiled paper frames, and the plants will set and ripen their fruit under these shelters; observing, that the early sowings in January sometimes produce ripe fruit in May, but come into full bearing in

in June; and those raised in February, and early in March, ripen fruit in June, July, and August; and sowings performed any time from about the middle of March till that of April, furnish ripe fruit principally in August and September, and sometimes in October.

Observe, therefore, that, like the Cucumbers, crops of Melons may be raised in three different ways; under frames and lights, under hand or bell-glasses, and under oiled paper lights; each of which shall be exhibited under a separate head.

The materials principally necessary in their culture are,

Frames and glass lights for early, and hand-glasses, &c. and oiled paper lights, for late crops; and for each crop good mats for covering on nights; all as observed for the Cucumbers.

Horse stable dung, a plentiful supply both for making the hot-beds, and for occasional linings, which must be in quality, quantity, and preparation, as hinted for Cucumbers, and in the article HOT-BEDS.

But sometimes, in the Melon culture, bark hot-beds are employed, or of bark and dung together, and, where tanner's bark can be easily procured, it is, on account of its regular and durable heat, a very proper material for hot-beds in the culture of Melons, either used alone, or mixed with hot dung, as explained in its proper place.

As to mould, the Melon, like the Cucumber, will prosper in any rich mellow kitchen-garden earth, prepared some months in a heap; but the favourite and most prosperous soil for the Melon is a fine, lightish, mellow loam, taken from the surface of a pasture field or common, enriching it with about one-third of rotten neat's dung, or thoroughly rotten dung of old hot-beds, preparing the whole in a heap, and managed as directed under the article COMPOSTS; observing, when it is to be used, not to sift or screen any, only break it well to pieces with the spade.

The situation, or place for making the hot-beds, should be dry, warm, full to the sun, and sheltered, as for Cucumbers; likewise observe, not to dig any trench for the early hot-beds, but make them entirely on the surface of the ground, for the reasons there assigned.

It is generally advised to cultivate Melons as far as possible distant from Cucumbers, lest the accidental intercommunication of their *farina* should cause a degeneracy; there is apparently some reason in this: however, when we consider that the two plants are real different species, I believe there is no great dan-

ger to be apprehended, as in the case of varieties.

The seed, and its kind, being material articles, you should be particularly careful to procure such only as has been saved from the very finest fruit of the respective approved varieties; this, if possible, should be two or three years old, for the reasons observed of the Cucumber seed; but when you are obliged to use new seed, it is proper either to deposit some in a paper, or phial, in a dry room near the fire, all winter, or in a phial, exposed in a dry window to the sun; or may carry them in your waistcoat or breeches pockets three or four weeks; either of which expedients will dry up much of the watery parts, whereby the plants will be less luxuriant and more fruitful. We receive Melon seeds annually from France, Spain, Italy, and other hot countries; but I would caution against depending on these for a principal crop; for, not being inured to this climate, the plants from such would be more tender and delicate in their culture, less fruitful, and the fruit often of much less value, than those of seeds saved at home; therefore, only a plant or two of these foreign seeds should be raised at first, just to prove the quality of the fruit.

From the time of sowing the seed to the maturity of the fruit, it is commonly about four months, and sometimes longer; for the plants seldom show fruit till they have shot several runners, which, from the first appearance of the plants, will be at least six weeks in effecting; from the appearance of the fruit till it is fairly set, a week or fortnight; and from its setting till fully ripe, will be about forty days.

The proper quantity of hot-bed in the culture of Melons for private use is, that for the smallest family there cannot be less than one three-light frame for the early, and three hand or bell-glasses, or three holes under a paper frame, for the late or succession crops; allowing two plants to each light of the frame, the same to each hand-glass, or each hole under the paper lights; and supposing each plant, one with another, to produce about three or four fruit, there would, in the whole, in a three-light frame, and in three holes under hand-glasses, or oiled paper shelters, be but about from thirty to forty Melons; though of the smaller sorts of Melon there will sometimes be from six to ten, or twelve, or more, on a plant; but six or eight are as many as the plants are able to bring to perfection: however, for the supply of a middling family, two three-light frames, and, at least, six hand or bell-glasses, &c. will be necessary to furnish a tolerable supply during

the season; and for a large family, four three-light frames, at least, or twelve lights, will be requisite, and double that number of hand-glasses, or holes of plants under paper frames.

We now proceed to the different methods of culture, and first of their early culture in frames, observe as follows.

Their Early Culture in Frames by Dung Hot-beds.

The time of year to begin the culture of Melons in frames, is January, February, and beginning of March; but when designed to have Melons as early as possible, we commonly begin in January, though the beginning of February is a more successful time of sowing to have a good crop; if, however, you begin early in January, it is proper to sow also twice in February and March for succession crops; likewise to be ready in case of accidents to the early plants, or that they should not thrive, as is often the case at a very early season.

The seed may be sown, and the plants raised, either in a hot-bed of early Cucumbers now at work, in the same manner in every respect as for them directed; or, where none is, make a hot-bed for a one-light frame on purpose, observing exactly the same rules with respect to dimensions, making, framing, and earthing the bed, sowing the seed, and other management, as directed for the early Cucumbers, as the same method of culture is applicable to both in their young growth; likewise, when the plants have been come up three or four days, and their cotyledons are a little expanded, transplant or prick them into small pots for the convenience of removal, as there directed; but of these, i. e. Melons, put only two plants in each pot, plunging the pots in the earth of the hot-bed; and manage them as above till fit to ridge out; for the Cucumbers and Melons being nearly of equal temperature, the same degree of heat, air, &c. suits both in this part of their culture; it would therefore be superfluous to trouble the reader with a repetition, since the particulars are fully exhibited under the article of *The Early Culture of Cucumbers in Frames*.

In this nursery-bed they are to be continued a month or six weeks, till their first runners begin to advance; observing, as their shanks rise in height, to earth them up by degrees with fine mould, till the pots are full, for this will greatly encourage them, and they will come fast into the rough leaf, and begin to form joints and shoot runners.

Observe, when their two or three first rough leaves are fully expanded, and another forming in the centre, appearing like a bud, which part being also the end of an advancing

shoot, it should just at this period of its growth be stopped, i. e. cut or pinched off close to the second or third leaf, as advised for the Cucumbers, to procure lateral shoots, called runners; for it is from these, or others issuing from them, that we are to expect the fruit; and when these first runners appear, the plants are ready for ridging out into the fruiting hot-bed.

The plants, from the time of sowing, till arrived at the above size for ridging-out, take about five or six weeks' growth.

The ridging-out, or fruiting hot-bed, should be prepared in due time to receive the plants when arrived to the proper age and size above mentioned; observing to prepare fresh hot dung a week or two in a heap, as for the Cucumbers, sufficient for one or more three-light frames; let the bed be made entirely on the surface, for the opportunity of lining quite to the bottom, carrying it up three feet and half high, raising the back or north side two or three inches higher; directly put on the frame and lights, to defend the bed from chilling rains, &c. and to draw up the heat-sooner, tilting the glasses behind for the steam to pass away; and in a week, or ten or fifteen days, according to the substance of the bed, its first great heat will abate; then prepare to mould it, and put in the plants, observing the necessary precautions, as for the Cucumber beds.

The bed being ready, as above, then wheel in your prepared mould, and lay just under the middle of each light about half a bushel or near a bushel of it in a heap, for the immediate reception of the plants, forming each heap into a sort of conical hillock about twelve or fifteen inches high, according as explained for the early Cucumbers; and that substance in height, &c. is applicable both in elevating the plants near the glasses, being of much importance in early work, and in affording the roots a good depth of earth; for they should generally have a greater depth of mould than Cucumbers, the plants being more impatient of moisture by watering, which is also prejudicial to the prosperity and flavour of the fruit, and, therefore, by allowing a good depth of earth, they will shift much longer without the aid of water: when the hillocks are thus formed, directly earth the other parts of the bed within the frame only about three inches thick at present, just to keep down the steam rising immediately from the dung; then shut down the lights, and, when the earth is warm, put in the plants.

In a day or two the heat of the dung will have sufficiently warmed the hills of earth; then bring the plants in their pots, being two in each; plant one pot of plants, with the balls

balls of earth about their roots, in the middle of each hill, as directed for the Cucumbers; and if the mould should appear dry, give a little water towards the outside, being careful not to wet the plants much at this time, especially if very early in the season; and as soon as planted, shut down the lights, to draw up the heat about the roots of the plants, but tilt them again in due time, to pass off the steam.

The plants being now finally ridged-out into the fruiting hot-bed, observe, that as the glasses are to be continued constantly on the frames till July, or all summer, your daily care is to admit fresh air at all opportunities in calm weather, by tilting the lights behind from about half an inch to two or three feet high, according to the temperature of the heat and steam of the bed, and that of the outward air, which must be also observed occasionally on nights at first ridging-out, if there is a great steam, for this must not be pent up, nor stagnated for want of air, to continue it in motion; cover the glasses also every night with mats, one or two thick, as shall seem necessary, but never let them hang down very low, all over the sides of the frame and bed, as often done, which would draw up a violent steam, and exclude the air too much from the plants, and draw them up weak and of a yellow colour; give water also occasionally when the earth appears dry: observing, in the performance of all of the above works in this bed, to follow strictly the same rules as exhibited in the ridging-out bed of early Cucumbers; but to keep in mind, that Melons being rather impatient of moisture, must have it more seldom, and less in proportion, than Cucumbers, especially near the main stem and principal roots; for by much moisture these parts are apt to canker and rot, so should be watered mostly at some distance from these principal parts; and never wet the vine or runners much at an early season; but when there is not less than ten or twelve inches depth of earth on the beds, they will not need water oftener than once a week or fortnight; and sometimes when the earth is of a loamy nature, and depth as above, and pressed down close that it may the better retain its natural moistness, the plants, after two or three waterings, till they have firmly established their roots, will often succeed with very little more water; and in that state they generally set their fruit more freely, and it ripens to a rich and high flavour; for redundancy of moisture retards the setting of the fruit; and although, after it is fairly set, occasional waterings will increase its magnitude, yet much moisture greatly diminishes its flavour and taste; but on

the other hand observe, that where the earth of the beds is of a light texture, or of but a moderate depth, the plants will all along require occasional waterings, especially in warm sunny weather; let it however be remembered, that when the plants discover their first show of young fruit, no water, or as little as possible, should be given, until the fruit is set as big as large walnuts, when, agreeable to the nature and proportion of earth, and other rules as above mentioned, and as hereafter hinted, use your discretion accordingly in watering.

Examine with care for the first week after ridging-out, that the earth of the hills and roots of the plants do not receive too much heat from the violence of the bed; and if there is danger, remove some of the earth around the lower part of each hill; and if any is burned at bottom, add directly some fresh in its stead, and in a few days or a week the burning quality will subside; then replace the removed mould again about the hillocks.

After danger of burning is past, cherish the heat as much as possible, by laying dry long litter around the sides of the bed, to defend it from chilling wet and cold piercing winds.

When the heat begins to decline considerably, be sure to revive it as soon as possible, by adding a substantial lining of hot dung to the sides of the bed at different times, as practised to the Cucumber beds, using the same precaution of earthing the top, &c. to prevent the steam of the linings entering under the bottom, or at any part of the frame; for the rancid steam coming directly from the dung would destroy the plants.

When the fibres of the plants begin to advance through the hills of earth, let some fresh mould be laid in the frame at different times to warm, and by degrees add each parcel around the hills, till the whole bed is gradually moulded nearly as high as the top of them; but rather let the top of each hill be about an inch higher, that the main stem and principal roots may be preserved moderately dry; otherwise, the occasional waterings would be more apt to soak to these parts, and might cause them to rot less or more, being very impatient of copious moisture: therefore, according as the mould is occasionally added, observe the aforementioned precaution; also to press it down moderately close, that by lying compact it may retain a due moisture in itself the longer, so as the plants will require to be the seldomer watered.

As the runners of the plants advance, dispose them with regularity; and when they are three joints long, if no young fruit appears, it is

is proper to perform a second stopping, by taking off the end of the extreme joint, to promote a more speedy supply of other lateral runners, which, together with others naturally arising from them, will sufficiently spread the bed with vine; and it is from these lateral shoots we may generally expect soon to see plenty of young fruit.

At the first training the vines, as above, if some dry and clean reeds are thinly spread upon the surface of the bed for the vines to run upon, it will preserve all the runners and young fruit from the damp of the earth, as well as prevent the earth and upper fibres of the roots from being dried too fast by the sun; some, for the above purpose, cover the bed all over closely with plane tiles; but this, I should think, rather excludes the necessary benefit of sun and air too much from the earth and roots of the plants.

When the young fruit begins to appear, it is of much importance to support a due temperature of heat in the beds, by occasional linings, &c. do not omit this, because the whole success of having the plants set a regular and plentiful crop of fruit depends on a good bottom heat, both to warm the earth sufficiently about the roots, as well as the internal air of the frame; for these fruit are so extremely tender whilst young, that without a proper heat they set very sparing and stragglingly, generally assuming a slow, stunted, and irregular habit of growth; maintain, therefore, the necessary degree of a moderately brisk heat, and the fruit will set freely, and swell fast in magnitude.

At this period also of the first appearance of the fruit, I should advise to forbear watering, if possible, till the fruit is set as large as good walnuts, as we above noticed; observing, that if the plants are growing in a tolerable depth of soil of a loamy nature, they will shift very well without any during that period, or longer, unless the earth should be very dry indeed, and then let them have it but sparingly; for if any considerable portion of water is given when the fruit is setting, the vine will acquire a glut of sap, and continue shooting with great luxuriance, which is contrary to the nature of these young fruit, as, being of such a delicate temperature in their infant state, and even during their minor growth, that the exuberant quantity of sap in the branches causes them to turn yellow, and drop off soon after they have blossomed, and sometimes after they have set as large as an egg, and more especially if there is not a proper degree of lively warmth in the beds.

According as the young fruit appears, you

will observe it accompanied by abundance of male blossoms; these must not be picked off, as too often practised, the *pulvis* or powder of their antheræ being absolutely necessary for fecundating the female flowers, and fertilising the young fruit; it is therefore of importance, not only to retain these flowers, but therewith, to assist nature, it is proper, in the early crops to perform the operation of setting, i. e. of applying their antheræ to the stigmata of the female blossoms, as directed for the Cucumbers, using for this purpose such male flowers whose antheræ are duly ripened, and well furnished with *farina*, which you may readily know by previously applying the antheræ gently to the thumb nail, to which some of the *pollen*, if ripened, will adhere; so using one or two males to each female blossom, and it will be found to assist greatly in setting the early fruit.

Air, at this time of blossoming, will also be particularly beneficial in promoting the free setting of the fruit; do not omit therefore to admit it every mild day, according to the rules formerly mentioned.

After setting the fruit, observe, that as they are most commonly produced on the lateral runners issuing from the sides of the main vine, and that exuberancy of sap retards their setting, I would advise, if your plants are rather luxuriant, to restrain the sap from flowing too abundantly into the setting fruit, instead of stopping the end of the runner, as often done, rather turn it carefully curve-ways, so that the end may incline towards the main stem, whereby the sap will be directed from the bearing runners, and its course continued principally into the more luxuriant branches; and the sooner this is done, the better; then, after the fruit is set, and a little advanced in growth, they must be turned again into their former position; though it is occasionally thought eligible to stop or prune off the ends of the bearing runners a joint or two beyond the fruit, in order that the whole nourishment of that branch should be directed thereto, in order to make it more certainly stand; which has sometimes the intended effect, at others the contrary, since stopping or shortening a branch often promotes its drawing a greater quantity of sap, which, as we above observed, is contrary to setting these fruit; therefore, those branches on which the setting fruit are immediately situated, should more generally remain entire, or not stopped until the fruit is fairly set, and full as big as a large walnut.

Neither is it proper to stop many of the runners, which would occasion their throwing out

out numerous shoots, and cause a great confusion of vine; but where the general runners are very superfluously numerous, it would be proper to thin them moderately, in some regularity, by pruning away some of the unfruitful and very weak and other obviously useless growths.

According as the fruit sets, and has attained nearly the size just mentioned, the branches on which they grow, if they were turned towards the main stem, as above advised, should now be reconducted into their former directions, that the sap may at that period find a freer passage to nourish the fruit.

Likewise, as the fruit sets, lay a piece of clean dry tile under each, to preserve it the better from the moisture of the earth.

The quantity of fruit to be expected to set and arrive to perfection, is from about two or three, to six or eight upon each hole of plants; but this is according to the sorts, for the Cantaleupe Melon sometimes does not set above two or three on a plant; on the other hand, the Romana will sometimes set and ripen eight or ten; and sometimes many more fruit will set than the plants are capable of nourishing; but when this is the case, they should be thinned; and even of the smaller kinds, leave only about six or eight of the most promising fruit upon each plant, and not more than three or four to five or six, according to the sorts of the larger kinds; and never leave more than one fruit upon the same runner, and that which is nearest the main vine is generally the most eligible to leave, though it is best to fix upon that of the forwardest and handsomest growth.

After a tolerable crop of fruit is set, and they advanced in magnitude, if the earth of the bed is dry, take the first opportunity of a mild day to give a good watering, especially if the bed is kept to a proper heat, which, according to the nature of the earth, and its depth on the beds, may be afterwards either gradually discontinued, or less or more repeated, as you shall see occasion by the temperature of moistness or driness of the earth; observing, in giving water, let it be rather more towards the sides than the middle of the bed, so as still to preserve the main stem and principal root always moderately dry.

Continue also admitting air at all opportunities every day when the weather is fine, which is also very beneficial to the free growth of the young swelling fruit.

Still, likewise, continue to support a due temperature of heat in the bed by occasional linings, with the usual care, even till May; for, by maintaining a bottom heat, the fruit

will swell freely, continue a regular growth and be in a little time surprisingly forwarded in magnitude. In applying the last lining in April, or beginning or middle of May, it is proper to earth it at top equal in depth to that of the bed, as observed of the Cucumber; and by raising the frame, the fibres of the plants will strike into the mould, and receive very great benefit, as will be evident from the healthful appearance of the plants, and free growth of the fruit; but observing, this part should be defended from great rains with mats, that the extreme fibres may not receive and convey too much moisture to the vines and fruit, otherwise it would be more advisable to confine the fibres wholly within the frame.

Shading the plants occasionally from the sun may be necessary in very hot days, from ten or eleven, to two or three o'clock, when the sun is so powerful as to endanger scorching their leaves, &c. observing the same rules as for the early Cucumbers.

As the leaves of the plants grow large, and press against the glasses, continue to raise the frame at bottom three inches; and as, in doing this, the earth next the frame will be disturbed, directly therefore make good all inequalities; and, if the leaves are considerably crowded, it is proper to thin them a little in proportion, so as that the young fruit may receive the necessary benefit of the sun and air.

If, after a due quantity of fruit is fairly set and advancing in growth, the vine is greatly crowded, it is proper to regulate them, by cutting off close all small runners, proceeding from the principal fruit branches, and others, and any luxuriant shoots that support neither bearing runners nor fruit, and such other vine as your observation shall judge to be superfluous or unnecessary, cutting them off quite close, which will greatly encourage the free growth, and promote the size of the Melons.

In May and June, as the vines of the plants will be advanced to the sides of the frame, if you have a full crop of fruit fairly set, they may be pruned so as to confine them within due compass; or, if you would have as many fruit as possible to succeed each other, they may be suffered to run out from under the frame upon the top of the lining, to produce some late fruit to succeed those already set within the frame, raising the frame high enough at bottom for that purpose towards the middle of June; observing, when the vines are thus trained out, to cover them every night, and in all very wet weather, with mats; for the glasses must also still be continued on the frames till the weather is become quite settled and warm towards the end of this, or in

in next month (July), and then only taken off occasionally, a few hours in the warmest time of the day, and always put on at night and all wet weather.

When the fruit is nearly full-grown, no water, or at least very little, should be given; for moisture will considerably retard its ripening, as well as rob it of the richness of its flavour. At this period of growth let each fruit be placed upon a brick, or some flat tiles placed one upon another, to raise it a little above the leaves to receive the greater benefit of the sun and air, whereby its flavour and relish will be considerably improved, being careful to turn it every two or three days, that every part may equally enjoy the benefit of the sun's influence; observing also, at this time, to admit a large portion of fresh air every mild day, by tilting the lights several inches behind, or in front, in very hot weather, which will also contribute very much to the rich flavour of the ripening fruit.

From the setting of the fruit to its maturity, it takes commonly about six or seven weeks, and sometimes more.

The maturity of the fruit is known sometimes by its cracking at the base, as if it would start or recede from the stalk; sometimes by its inclining to a yellow colour; frequently by imparting a fragrant odour; and when the top of the fruit is soft, it is always a sure indication of ripeness; therefore, observing these appearances of maturity, let the fruit be cut at the proper time; for if suffered to remain on the vine a day or two longer, it will lose much of its flavour. Let it be cut in a morning before the sun shines hot to evaporate its rich juices, cutting each fruit with all its stalk, and lay it in a dry but cool airy place till it is wanted for table.

In the latter end of June, and in July, if the weather is dry and warm, the plants may be gradually inured to the full air, by shoving the glasses off a few hours in fine dry days; but let them not have much rain, lest it rot the main stem of the plants, and it would also debase the flavour of the fruit; therefore retain the glasses ready at the back of the frames, to draw on every night, and all very wet and boisterous weather; or they may be continued mostly on the frames, and opened considerably, to admit plenty of fresh air every day.

Their Culture under Hand or Bell-glasses.

Principal crops of Melons, to succeed the forward crops in frames, are most commonly obtained by ridging-out plants in hot-beds under hand or bell-glasses, in April or May. For they will then, and not before, succeed by

this mode of culture; therefore, the main crop, to come in after Midsummer, may be obtained without the aid of frames, as observed of the Cucumbers; or if the frames are all employed, or that you are not sufficiently provided with such conveniencies, you may always have a good crop of Melons under these kinds of glasses, ripening in July, August, and September.

The culture of Melons under these hand or bell-glasses is effected by sowing the seed in March or April, in a nursery hot-bed, under frames and lights, and when the plants are about a month old transplant them into ridges or hot-beds, under the above glasses, to remain for fruiting; but, in default of frames, the plants might even be raised entirely under hand or bell-glasses, placed on a hot-bed, sowing them in April, and transplant them into a fresh hot-bed in May under the same sort of glasses, or oiled paper lights; they will sometimes come in for a tolerable crop in August and September; however, the most eligible practice is, to sow and forward the plants in a hot-bed, under frames, pricking the young plants in pots, so continuing them in the frame hot-bed till large enough to ridge-out, then transplant them with balls into the fruiting hot-bed.

The most proper period of time for sowing the above crops is about the middle or third and fourth week in March; but, if possible, for the main crops, never be later than the first week in April.

And the time for ridging-out the plants under these glasses is from about the eighteenth or twentieth of April until about the middle of May.

For it must be remembered, that the plants for these hand-glass crops must never be raised nor ridged-out before the above-mentioned times, otherwise they would advance too forward in growth, and fill the glasses before the nature of the season admitted of their being trained out, unless sheltered by paper frames, as they must not be confined within the small compass of these glasses, longer than the beginning or middle of June, when the weather is become settled and warm; nor ought the principal crops to be sown or ridged-out later than the times above specified, because they would not be forward enough to ripen their fruit in perfection before the approach of cold weather in autumn.

The seed may be sown, and the plants raised large enough for ridging-out, either in the hot-beds of forward Melons or Cucumbers now at work under frames, or in a small hot-bed made on purpose for a one-light box, &c. earthed a few inches deep, sowing the seed either

either in pots half an inch deep, or in the earth of the bed, drilling it in that depth, so managing them the same as the seedling Melons and Cucumbers for the frame; prick the plants also in pots, when a few days old, two in each pot, as in the frame crops, giving them nearly the same culture; and the plants having expanded their two first rough leaves, and beginning to push runner buds, stop these latter at the first joint, as before directed; and when a month or five weeks old, they will begin to shoot runners, and should then be ridged-out into the fruiting hot-bed.

Therefore you must forecast to prepare the dung, and make the ridges or hot-beds in proper time, to be ready to receive the plants at the above period of growth.

The dimensions of the fruiting hot-bed should be four feet and half wide, and, if made in April, two feet and half or a yard high; and even if made early in May, two feet and half depth of dung will be requisite; nor should it be less than two feet high, made in any time of that month; and the length in proportion to the number of glasses you intend working, allowing them at a yard and half distance from centre to centre, in one row along the top of the bed; observing, that if the plants are ready for ridging-out in April, or beginning of May, I would make the bed entirely above ground, for the opportunity of lining the sides when the heat declines; or, at this season (May), the ground being tolerably dry, as there will not be much danger of water standing, the bed may be made in a trench, for the advantage of having it retain its heat the longer, making the trench four feet wide, and eighteen inches deep; but observing, that in three weeks after the bed is made, the trench must be widened a foot and half on each side, and to the full depth, to admit of a lining of dung that width and depth to each side of the bed; for hot-beds made for these plants at either of the above-mentioned times, either on level ground or in a trench, will receive considerable benefit by having a lining of hot dung added to each side in three or four weeks after making, which will not only throw in a fresh heat, but, by being earthed at top, gives an additional width for the roots and vines of the plants to extend; observe likewise, if more than one range of hot-beds are intended, make them one before another in a parallel direction, allowing a space of four or five feet between, which may afterwards be part filled up with a lining of warm dung and earth at top, close against the sides, and as high as the top of the ridges; which will prove an additional benefit to the plants

in forwarding them in a good prolific growth, to furnish a plentiful production of fruit.

The ridge or ridges being made, then, according to the rules and precautions explained in the hand-glass crop of Cucumbers, prepare to earth it with the proper compost for the reception of the plants, first marking out with sticks the places for the glasses, in a row along the top of the bed, at a yard and half distance; and then, on each place where the glasses are to stand, lay about a wheel-barrow-ful of mould in a hill ten or twelve inches high, and wide enough for a hand-glass, for this depth of earth is as necessary here as in the frame crops, covering the other parts of the bed between the hills only three inches deep at present, that the burning steam and heat may have due vent, yet to prevent it from evaporating too suddenly; but the whole is afterwards to be gradually earthed almost as high as the top of each hillock: as soon as the bed is thus earthed, set on the glasses, one upon each hill of earth, covering the whole with mats at night, to draw up the heat the sooner; and in a day or two the earth will be warm enough to receive the plants.

When the earth, therefore, under the glasses, is properly warmed by the dung, then, having previously watered the pots of plants the day before, that the earth may adhere in a ball about their roots, proceed to plant one pot of two plants under each glass, removing the plants out of the pots with a ball, in the manner directed in the early Cucumber hot-beds; and levelling the tops of the hillocks broad enough for each glass to stand, make a wide hole in the middle, and plant the ball of plants, giving directly a moderate watering, and put on the glasses, which must remain constantly over the plants, and be covered every night for a month or two, and all bad weather, with mats.

They being now ridged-out, observe, if their removal causes them to flag their leaves at the approach of the sun, it is necessary to indulge them with a moderate shade the first three or four days, or a week, when sunny, or till they stand the sun fully without flagging.

Fresh air must also be occasionally admitted in the warmest time of every fine day, by tilting the south side of the glasses an inch, or a little more or less, according to the heat of the bed and temperature of the weather, having particular attention to shut them down close in due time in the afternoon, or as soon as the weather changes cold, keeping them close on nights, also in all unfavourable weather in the day-time, unless there is a very great steam, when, during its continuance, the glasses must

not be kept too close; and, if the weather is then cold or windy, the place where they are tilted may be defended with a mat; observing, as the warm weather advances, and the plants make progress in growth, a larger portion of fresh air must be admitted, to harden the runners gradually, in order to be trained out from under the glasses in June.

Cover the glasses and the whole surface of the bed every night with large mats, which must be constantly practised until the beginning or middle of June, or longer, if cold weather renders it necessary.

Likewise, in all heavy or cold rains, at any time, night or day, from the time of ridging-out to the maturity of the fruit, particular care should be taken to defend the whole ridge, by a good covering of mats, for much wet would ruin the crop.

Waterings in warm weather once a week or fortnight, in moderate quantities, may be necessary, according to the rules mentioned in the frame crops.

- In a week or fortnight after ridging-out, when the heat of the bed is become moderate, begin to earth the whole gradually almost as high as the top of the hills on which the plants stand, pressing the earth down gently from time to time, that it may retain its moisture the longer, so as the plants may not require much water, for the reasons explained in *the Frame Culture*; raising the whole nearly equal with the summits of the hillocks, preserving the middle of each rather highest, to prevent moisture from soaking to the main stem, &c. as formerly cautioned.

Lining the ridges will be necessary in about three or four weeks after they are made; this ought not to be omitted, especially to those made in April, or early in May; and having for this purpose a quantity of well-prepared hot dung, add it to each side of the bed, fifteen or eighteen inches wide, and full as high as the dung of the bed, and directly earth it at top to the thickness of that on the ridge; and thus, by the addition of the linings, besides the advantage of renewing the heat, it widens the bed to about seven feet, and forms a fine scope for the fibres and vines of the plants; observing, if there are two or more ridges ranging parallel at a small distance, that if the whole space between was afterwards gradually filled up with warm dung and mould, it would prove still more beneficial to the plants.

Having directed stopping the plants at the first joint to procure lateral runners, if these laterals are also stopped at the third joint, they will more speedily furnish a farther supply for bearing, as observed of those in the frames.

About the end of May, or beginning of June, the first ridged-out plants will have nearly filled the glasses with their runners, at which time do not omit indulging them with a large portion of free air at all opportunities, by tilting the glasses every mild day two or three inches high, or in proportion to the temperament of the weather, so as to strengthen the runners, and harden them by degrees to the full air; and in June, when so much advanced in growth that they can be no longer contained within the glasses, they must be trained out; the glasses must then be raised two or three inches on every side, on props, as for the Cucumbers, and the runners trained out with regularity; but if some dry reeds are previously spread upon the surface of the bed, for the plants to run upon, it will preserve them and the young fruit from the damp of the earth; observing, the glasses are to remain constantly over each hole of plants, to protect the main stem and principal roots the better from wet and other inclement weather, but are now to remain day and night supported on the props, as above: continue also the nightly covering of mats for the first fortnight, at least, after the plants are trained from under the glasses, to protect the tender vines till inured to the full air.

Observe, likewise, that as Melons are rather impatient of copious moisture, it is advisable, after being thus trained out, to protect them with great care from excessive rains and cold, at all times, day or night, by proper covering; the most effectual means for this purpose is, to place oiled paper frames over some of the ridges, as soon as the vines are trained out, as directed in their culture under *Paper-frames*: however, in default of these conveniencies, if much wet weather, I would advise to arch the bed over with hoops or rods, &c. just to the height of the hand-glasses; so having good thick mats or canvas cloths always ready to draw over the arches, in time of heavy or cold rains, and blustering winds, will be found of very considerable advantage, since a few hours violent rain would injure the plants so greatly, that they never after recover, so as to produce handsome fruit, or bring any tolerable crop to perfection.

But when the beds are covered with paper frames, these remaining constantly on the beds, effectually defend them at all times, and admit a due portion of light, &c. to the plants.

If, however, you use only mats or canvas, to cover occasionally in cold nights and bad weather, let these be always taken wholly off betimes every fine morning, or as soon in the day as the weather is favourable.

In June and July the plants will spread their runners all over the bed, and will show fruit abundantly, at which period of showing fruit very little water should be given, especially if there is a proper depth of earth on the beds, still observing the same rules for this, as directed in the *Frame Culture*; but in very hot dry weather, after the first tolerable show of fruit is fairly set, and beginning to advance in magnitude, a moderate watering, once a week or ten days, whilst the fruit are taking their growth, will encourage them, promote their size, and increase the substance of their flesh; being careful to apply the water more towards the sides of the bed to the extreme fibres, so as to preserve the main stem and principal roots from receiving too much wet; and be sure never once to over-water the beds, which might prove of very bad consequence; but for the greater convenience of watering at this period, a deep drill may be formed around the outides of the bed, and the necessary supply of water poured into this drill, whereby the radical fibres will receive its benefit, and communicate it sufficiently to the branches and fruit; but when the fruit is nearly full grown, give as little water as possible.

With respect to useless and superfluous or unnecessary branches or runners, if there are any, it is eligible culture to clear them off occasionally, to prevent confusion of vine, and for the prosperity of the fruit; executing it according to the rules laid down for those of the frame plants.

Observe also the same of superfluous fruit, leaving only such a due quantity of the most promising and best-situated in each hole, as the plants can be expected to bring to perfection.

During the growth of the fruit, observe, that if the ridges are not covered with oiled paper, but only with the hand-glasses, &c. and the weather should prove rather unfavourable or wetish, and that many of the fruit are situated on the advanced vine without-side of the glasses, it is advisable either to move the fruit gently under their own respective glasses; or rather, where there are any spare glasses, bring these and place over the fruit, contriving each glass to cover as many as may be convenient; for it is necessary thus to protect these fruit from injury of weather, supporting each glass two or three inches high on props; and this shelter of the glasses will greatly improve the size and flavour of the fruit: but in unfavourable seasons oiled paper frames generally prove very effectual, because, being placed all over the ridge, they defend the plants also, as well as the fruit, both from

cold and wet; or in cold wet seasons, if there are any spare garden-frames and lights, these might be placed over the ridges, as soon as they are at liberty in June, July, or August, so to defend the plants and fruit the remainder of the summer, by drawing on the lights in all unfavourable weather, day or night.

When the fruit is increased somewhat considerably in growth, it is proper to turn them every three or four days, that they may swell equally, and each side have an equal benefit of the sun.

Their ripening is determinable by the appearances of maturity, mentioned in the culture of the early crop, observing also the same rules as there advised in cutting them for table.

Raising them under Paper Frames.

Melons are also fruited in great perfection under oiled paper frames, by placing them over those ridges of plants which are ridged out in April and May, for they will not succeed in earlier crops, but for the crops just mentioned, they are considerably the most eligible shelters to place over the ridges in the middle or latter end of May, or beginning of June, after the plants have filled the hand-glasses, these being then previously removed entirely away, and the paper frames placed upon the bed; for these frames being made of proper width and length to cover the whole ridge, and the paper being well oiled with linseed oil, to render it proof against wet, and more pellucid or transparent to admit the rays of light and heat of the sun in a proper degree, they are continued constantly upon the ridges, whereby the plants are at all times protected from inclement weather, either wet, wind, cold, or heat, as, although the paper admits the rays of light, &c. yet it, at the same time, affords the most agreeable shade from the scorching sun.

These frames are formed either like the roof of a house, or archways, like the tilt of a waggon, four feet wide, ten long, and two feet and half high, framed of thin slips of wood and lath, or broad hoops, &c. but those made ridge-fashion with two sloping sides, in the manner of the ridge of a house, are rather the most eligible form, because, on one side, may be made two pannels, to open with hinges towards each end, and each pannel about two feet wide, being convenient for giving air, and other necessary work: in either of the above forms the frames are constructed in an open manner, having the ribs or spars a foot or fifteen inches asunder, or at such distances as to admit of pulling the sheets of paper commodiously; but previous

to pasting on the paper, draw lines of packthread, &c. across-ways from rail to rail of the frame, drawing other lines intersecting or crossing the first, these being necessary for supporting the paper the more effectually against the power of wet and wind; then having some strong demy paper, let it be a little damped, that it may not sink in hollows after it is fixed on the frame; and as soon as it is thus prepared, paste it on the frame regularly; two large sheets will generally range from bottom to top, pasting it securely to the rafters and rails, and so as the middle of each sheet rests upon the intersections of the packthread lines; and when the paper and pasting is thoroughly dry, brush the outside all over lightly with boiled linseed-oil, then suffer the frame to stand in a dry shed till the whole is perfectly well dried before it is used. See PAPER FRAMES.

But for want of regular made frames, a quantity of hoops or rods might be placed across the ridges of plants arch-ways, sticking both ends into the earth, about a foot asunder, and two high, so drawing lines of packthread along from hoop to hoop, both to steady the arches, and help to support the paper; then paste a quantity of strong paper in large pieces about three or four sheets in width, and in length proportionable to that of the ridges they are to cover; then oil them with linseed-oil, and, when thoroughly dry, spread them over the hoop-arches, and secure them by lines drawn from end to end; and for the admission of air, and doing other necessary work, one side of the paper is readily turned up at bottom as far as convenient.

In respect to the mode of using either of these paper shelters, the plants are previously to be raised in hot-beds, under frames and lights, exactly at the time and manner, directed for the hand-glass crops, and to be ridged-out also at the same times and manner there mentioned, and covered with hand-glasses till the plants advance in runners; or, in default of hand-glasses, these paper frames may be used as soon as the plants are ridged out; but in this case the ridging-out should not be performed till May; but, when there are hand-glasses sufficient, it is most advisable to place these glasses over the plants at first ridging-out, as directed in the hand-glass culture, managing them in the same way in every respect, till the plants have filled the glasses with their runners; then remove the glasses away, train out the runners in regular order on the surface of the bed, and place over the paper frames.

When these shelters are placed over the plants, free air must be admitted in proportion to the temperature of the season; either by opening the pannels less or more, according to the warmth of each day, or by tilting one side of the frames at bottom, &c. for the article of fresh air must not be omitted at all opportunities, particularly when the plants show fruit, the air being not only necessary to strengthen the plants, but also to assist in the impregnation of the fruit, for the reasons explained in the early Cucumber work; and towards the end of June, when the season is warm, the frames may be raised at bottom about four inches.

It is also necessary to defend the plants with mats spread over the above shelters every night till towards the middle of June; likewise, occasionally, in all hard rains, day or night.

These paper shelters never last but one season, that is, the paper; but as to the frames, they, with care, will continue useful several years, so must be fresh papered every spring, in proper time to be ready to place over the beds.

Raising them in Bark Hot-beds.

Having before advanced hints respecting the merit of tanner's bark hot-beds in the culture of Melons, observe, we propose them principally as fruiting beds; that is, previously raising the plants in dung hot-beds, as already directed, and then transplanted into the bark-beds.

With respect to the merit of these sort of hot-beds for this purpose, it must be considered, that as the Melon plants are generally between three and four months from their first appearance till they produce ripe fruit, and they all the time require the constant aid of artificial heat, and although this is commonly effected, and the plants fruited in good perfection by dung hot-beds, those of tanner's bark being considerably of more durable and regular heat, the plants by that aid may still be fruited to greater advantage, and with less trouble, because, if made entirely of new tan, no lining, or but very little, will be necessary, nor is there such danger to be apprehended from steaming or violent heat, as in dung hot-beds; but the purchase of the tan renders these kind of hot-beds more expensive than dung, though, if both these materials are obliged to be purchased, and the tan can be obtained within a moderate distance, there is but an inconsiderable difference in the expense.

But, in case of scarcity of new tan for the above purpose, the waste or cast-off bark of the

the stoves, mixed with a quantity of new, might be used, provided, however, the old tan is not become quite earthy; so mixing one half old to one of new, which will form a moderately strong and durable heat, and will answer for hot-beds made not earlier than the middle of February, or beginning of March.

Or, for later crops, beds might be formed entirely of cast-off bark, provided, as above observed, it is not become very earthy, and its fermenting property not quite exhausted; which, when fresh worked up, and formed again into a bed, will renew its heat, though in a moderate degree, therefore should not be used for beds earlier than March and April, and if made in a pit formed of post and planking, so as to admit of a substantial lining of hot dung to each side in six weeks or two months after making, would be an additional advantage to the plants.

Observe, that either the above-mentioned bark-beds for the culture of Melons, must be made in some kind of pit, or frame, to confine the bark, which otherwise could not be formed into a bed, either in a bricked bark-pit covered with glass lights, as exhibited in the article BARK-PIT; or, in default of such a pit, one might be formed of post and planking, of width and length for one or more large three-light frames, and generally about three feet deep, to contain that substance of tan-bark, and may either be sunk half way in the ground, or not so much, according as the soil is dry or wet; but it would be most convenient to have it not sunk more than a foot, for the advantage of adding a lining of hot dung to the sides, if there should be occasion; I would therefore observe, that a planked pit, for the culture of Melons, may be rather preferable to brick or stone, because if you shall find it necessary to line the beds, by applying hot dung against the outside of the planking, its heat will more readily penetrate sufficiently to recruit the declining heat of the bed; for as the Melons are to be planted in the full bed, and not in pots, as practised to pine-apple plants in bark-beds, there is no stirring up the bark to revive the heat as in stoves, and a lining may probably be necessary to those beds, where cast-off bark is used; or perhaps sometimes one lining, to those beds made of new tan, may be of advantage, just when the fruit are setting and taking their first growth; on these considerations contrive the pit so as to admit of lining the sides almost or quite to the bottom.

The time of the year to begin the culture of Melons in these sort of hot-beds is the same

as mentioned in dung hot-beds, and the plants should be raised in a nursery-bed as there directed; and when of the proper age and size, as there observed, transplant them into the bark-beds to remain to fruit.

These fruiting-beds should be made a fortnight or three weeks before-hand, to acquire a proper heat in due time for the reception of the plants from the nursery hot-bed, at their proper period of growth. Let the beds be made the full width and length of the pit allotted for them, and three feet, at least, depth in bark will be requisite. As soon as made, cover the bed with the proper frames and glasses, to defend it from rains; and in about a week or fortnight it will be arrived to a proper temperature of heat; then earth it at top, as directed for the dung-beds, and the earth being warm, set two plants with their ball of earth entire, just under the middle of each light, give a little water, and manage them according to the former directions.

But if intended to make the bed mostly of cast-off bark, as this will be somewhat of a mouldering texture, and of but moderate heat, instead of earthing it as above observed, you may try the success of planting entirely in the bark, without any earth at all. Let the bed be of the above-mentioned dimensions, and covered with the frames and lights, and in about a fortnight or three weeks it will be warm enough either to receive seed, or plants: first making holes in the middle of the bed, one immediately under the middle of each light, six or eight inches deep, and twelve or fifteen broad, fill them with rotten or finely pounded bark, forming each a little hollow, basin-like, in which either sow seed, and when the plants are a week or two old, thin them to two of the best in each hole, and there let them remain to fruit: or, to make the most of the bed, put in plants raised to a proper age, as in the dung hot-bed culture.

The plants being transplanted into either of the above bark hot-beds, observe, the lights are to be kept constantly on, being careful to give the plants a proper share of fresh air at all opportunities, as the weather permits, according to the former rules.

It must be remarked, that the plants will not require much water in these hot-beds, as the bark continues to support a fine moist heat, of a very agreeable nature to the growth of most sort of plants, so that the Melons will be found to succeed with a very moderate supply of water, and the less the better, both for the continuance of the heat of the beds, as well as for the advantage of the plants and fruit.

Should you find the heat of the beds considerably declined when the fruit is setting, or taking its first growth, a good lining of hot dung against the outsides of the pit will be very beneficial.

Saving the Seed.

As to saving Melon seed, we need only farther observe here, that it should be saved only from the very finest fruit of the respective varieties, and such as has a firm and highly flavoured flesh; this should be particularly observed when the fruit is served at table, and the right seed properly reserved in its own pulp, which, after lying in the pulp a few days, may be washed out, and all the heavy or good seed which sink in the water are to be preserved, dried, and put up for future sowing.

It will retain its germinative property ten or twelve years, but when from about three to five years old, is in its best perfection for use, for reasons already given.

- To the above species may be added a third, viz.

CUCUMIS flexuosus.

Serpent Cucumber, or Melon.] With sublobate, angulate leaves, and very long, slender, cylindric, furrowed, curved fruit.

This species, in its growth and appearance, partaketh more of the Melon than the Cucumber: the culture of it is of the same as above described for the Melon; it is retained in some gardens for the singularity of its long snake-shaped fruit, more than for any other use, some of which grow six or seven feet in length.

CUCURBITA, the Gourd and Pom-
pion, and also the *Citrullus* or Water Melon.

The plants are herbaceous annuals, mostly of trailing growth, extending from about five or ten to forty or fifty feet in length, adorned with luxuriant simple foliage, and large monopetalous bell-shaped flowers, succeeded by fruit of various shapes and magnitudes in the different species and varieties; as, oblong, round, oval, turbinate, buckler-shaped, &c. some three or four to five or six feet growth; others, half, or quarter that size, and much smaller; and some not exceeding two, three, or four inches; and the plants are cultivated in our gardens, some by way of curiosity or variety, and some for the sake of their fruit, particularly the Water-Melon. See **CUCURBITA CITRULLUS**.

Class and order, *Monœcia Syngenesia*.

Characters] **CALYX**, male and female flowers apart, having a monophyllous bell-shaped cup, terminated at the brim by five bristles. **COROLLA** is monopetalous, bell-

shaped, five-parted, and adheres to the calyx: **STAMINA**, in the males, three connivent filaments, and linear reptant antheræ. **PISTILLUM**, a large germen under the female corolla, a conical, trifid style, and a large trifid stigma. **PERICARPIUM**, a large fleshy fruit of three membranaceous cells, and numerous compressed, obtuse seeds, in a double series.

We shall first exhibit the Gourd and Pom-
pion tribe under one head, and the *Citrullus*, or Water-Melon, in another. See **CUCURBITA CITRULLUS**

Of the Gourd and Pom-
pion kinds there are about five species, each of which admit of several varieties in the form and size of their fruit; some assuming a long figure, obtaining from about one or two to five or six feet in length, and one or two round; others assume a round form, and as large as a half-peck; or even a peck, or almost a half bushel measure, and of other various forms and magnitudes down to the size of an orange; and the plants grow so rapidly, that rising from seed in spring, they extend from about five or ten to twenty or thirty feet, in some sorts, by August and September, at which times they perfect their fruit, and in October and November following they totally perish; so that they are of but little more than five or six months' duration. They are exotics of America, and other distant countries, but are hardy enough to grow here in the full ground, from May till October.

The species are,

1. **CUCURBITA lagenaria.**

Bottle, or Barrel Gourd.] *Cucurbita* with trailing, thick, downy stalks, branching into many spreading runners, extending along the ground fifteen or twenty feet in length, large, roundish, heart-shaped, indented, woolly leaves, biglandulous at the base, and large white flowers, succeeded by long, incurvated, whitish-yellow fruit, obtaining from about two to five or six feet in length, and about nine to eighteen or twenty-four inches round, having a ligneous, durable shell, that having the pulp scooped out, is used for holding water, &c.

Varieties of this are,] Common long-fruited Bottle-Gourd—Long protuberant-bellied Bottle-Gourd—Long sickle-shaped Bottle-Gourd—Long taper Bottle-Gourd—Long turbinated Bottle-Gourd.—All these varieties, if forwarded in spring in hot-beds, and planted out in May into the natural ground, or rather upon holes of hot dung under hand-glasses, to be sheltered during the cold weather; the fruit will obtain a large growth, and ripen perfectly. Some of which have acquired such

a pro-

a prodigious magnitude, as, when scooped, the shell has contained twenty-two gallons of liquid, and in America, where they grow in great abundance, the shells are converted into many useful domestic utensils. The fruit, while quite young and tender, is also very commonly used in both Indies as culinary dishes, both to eat alone, and as sauce to flesh meat.

2. CUCURBITA *Pepo*.

Pepo or Pumpkin, commonly called Pumpkin.] Cucurbita with trailing, strong, rough stalks, branching into numerous runners, spreading along the ground, from about ten to twenty feet, or more, garnished with large, roundish, lobated, rough leaves, and yellow flowers, succeeded by large, round, smooth fruit, of different forms and sizes in the varieties, some as big as a peck, or almost a half bushel measure, others considerably less, and some not bigger than an orange, ripening to a yellow, and sometimes a whitish colour, &c.

Varieties of this are,] Common large round-fruited yellow Pumpkin—Oval yellow Pumpkin—Oblong yellow Pumpkin—Whitish fruited Pumpkin—Stone-coloured Pumpkin—Flesh-coloured Pumpkin—Party-coloured Pumpkin—Marbled Pumpkin—Small round Pumpkin—Orange-shaped Pumpkin—Pear-shaped Pumpkin—Turbinated Pumpkin—Hemispherical or semi-globular Pumpkin—Egg-shaped Pumpkin—Striped roundish Pumpkin—Striped egg-shaped Pumpkin—Striped turbinated Pumpkin—Striped pear-shaped Pumpkin.

This species and varieties are the most hardy, as well as considerably the most extensive in their growth, as a single plant, if properly encouraged, will overspread ten or fifteen rods of ground, in three or four months, and produce a great number of fruit, which, when young, are generally a mixture between a deep blue and pale white, but change as they increase in volume. The plants are cultivated in England principally for curiosity, the fruit being rarely used; though in some parts of Asia, and Africa, these, as well as the Gourd, make great part of the food of the poorer people during the hot months; and, if gathered when not much bigger than a hen or goose egg, boiled and properly seasoned with butter, vinegar, &c. they eat tolerably palatable either alone or by way of sauce to butcher's meat; they are also used in soups; but here in England they are seldom used till grown to maturity, when making a hole on one side, and divest the pulp of all the seeds, then mix it with sliced apples, milk, sugar, some grated nutmeg, &c.

and thus make a kind of pudding, prepared in the shell, and bake it in an oven, which is commonly called pumpkin pie, for which purpose the plants are cultivated by the country people in many parts of England, who plant them upon old dung-hills, or compost heaps, or such like places; for the seed, if not sown till May, will grow in the open ground; however, to have them in more early perfection, it is best to forward them in a hot-bed in April, and plant them out in the middle of May. See their *Culture*.

3. CUCURBITA *verrucosa*.

Warted Gourd.] Cucurbita with trailing stalks, very branchy and spreading, running upon the ground ten or fifteen feet each way, large lobated leaves, and yellow flowers, succeeded by roundish, knobby-warted, white fruit of different forms in the varieties; and all of moderate size.

Varieties are,] Roundish Warted Gourd—Oblong Warted Gourd—Flat Warted Gourd—Bottle-shaped Warted Gourd—Orange-shaped Warted Gourd—Lemon Warted Gourd—Yellow fruited—White fruited.

These varieties are also all used, while young, as culinary, in many parts of America.

4. CUCURBITA *Melopepo*.

Melopepo, or Erect Gourd or Squash.] Cucurbita with an erectish strong stalk several feet long, rarely sending forth side runners, but becoming bushy upward, adorned with large lobated leaves, and the flowers succeeded by depressed knotty fruit, both of white and yellow colours, and of different forms in the varieties, but chiefly of a moderate growth.

Varieties are,] Common broad flat Squash—Buckler-shaped Squash—Conical Squash—Citron-shaped Squash—Flat-sided Squash—Turbinated Squash—Hemispherical Squash—Depressed star-shaped Squash—White-striped Squash—Yellow-striped Squash.—All of which varieties generally grow with stronger and somewhat erect stalks, but generally require support; and by sowing the seed several years in the same ground, they are apt to vary, and assume a trailing growth, and put forth runners like the other species. The fruit, when nearly half-grown, being boiled, is by some people esteemed very delicate; but the Americans generally pluck it for use soon after the falling off the flower, or when the fruit is the size of a walnut, or at most not bigger than a hen's egg.

5. CUCURBITA *lignosa*.

Lignous-shelled Gourd, often called Calabash.] Cucurbita, with trailing stalks, branching into runners, extending many feet each way,

way, large, lobated, rough leaves, and yellow flowers, succeeded by roundish, moderate sized, smooth fruit, of different forms in the varieties, and the shells become hard and woody.

Varieties of this are,] Round-fruited—Roundish bottle-shaped, being almost the size and shape of quart bottles—Pear-shaped fruit—Orange-shaped yellow fruit.

Among the varieties of the last four species there are some whose fruit are of the size, shape, and colour of oranges, lemons, and pears, which appear extremely curious when growing. These are commonly denominated—Smooth, yellow Orange Gourd—Rock or carbuncled Orange Gourd—Stone-coloured Orange Gourd—Lemon Gourd—Rock Lemon Gourd—Yellow, pear-shaped, striped Gourd—Pear-shaped, white-striped Gourd, &c.

But it must be observed, that the varieties of all the species of Cucurbita are amazingly variable in their fruit; that without particular care in cultivating them separate, they seldom continue the same longer than two or three years; for those of each species vary less or more from seed, both in figure, size, and colour.

The plants in general have strong, thick, succulent stalks; the leaves very large, elevated on long foot-stalks, arising alternate from the joints of the stalks and branches; and the flowers are male and female apart on the same plant, proceeding from the axillas of the leaves, and the germen of the female flowers becomes the fruit. See the *Characters*.

All these species of Gourds and Pumpions, &c. and respective varieties, obtain estimation principally as plants of curiosity, for the singularity of their growth and fruit, and are admitted in curious gardens, both as plants of variety and ornament; and as such, if properly disposed, will exhibit a singular appearance, are all raised from seed, in a moderate hot-bed in April, as hereafter directed, and transplanted into different parts towards the middle or latter end of May, in any open, sunny situation, in bed, borders, &c. and some may be disposed in open, vacant spaces, contiguous to lawns and spacious walks, training some along upon the surface of the earth, according to their natural growth, others may be trained about tall stout stakes fixed securely in the ground, and some may be conducted over bushes, or up the stems of shrubs and trees, and their course directed among the branches. They have likewise a fine effect when trained upon arbours of trellis work, or railing, which they will soon overspread; and they also form a fine variety, trained against a wall, paling, or any kind of fence; in all of which me-

thods of training they will bear plentifully; but the fruit is the most conspicuous and ornamental when the plants are trained upon some kind of support, which is more particularly necessary to be practised in all those sorts denominated Gourds.

As the plants in general delight in a fat soil, they, when planted on old dung-hills, or dungy compost heaps, generally make amazing progress, but more particularly the pumpkin kinds, where they will spread wonderfully, and produce abundance of fruit in its fullest perfection.

But of the Gourd kinds, the Wartyed-Gourd, Melopepo or Squash, and the Ligneous Gourd or Calabash, are commonly the most fruitful when trained upon some support, and the fruit sooner obtains the largest size: and we may observe of the Bottle-Gourd, that, as in some varieties of this species the fruit grows very large, the plants should more generally be permitted to extend along the ground.

As the fruit of these plants is but of little estimation in England for culinary uses, our gardens furnishing many other esculent plants, roots, and fruits, of a more palatable flavour; a few plants of each sort should, therefore, only be cultivated, because they require so much room to spread.

Their Propagation, Culture, &c.

All the species of Gourd and Pumpions, and their respective varieties, are raised from seed sown annually in April and beginning of May, either by aid of artificial heat, or without; but the plants forwarded in a hot-bed till about a month old, come into fruit a month or six weeks earlier, and will ripen sooner in proportion.

Therefore, the seed may either be sown in a moderate hot-bed about the middle of April, half an inch deep; and when the plants have three or four leaves, transplant them in May or early in June into the open ground, or upon holes of hot dung, under hand-glasses, &c. which will forward the plants considerably.

Or, for want of hot-beds, the seed may be sown in the full ground in the first or second week in May, but not sooner. The *Cucurbita Pepo*, or Pumpkin, in particular, succeeds rather better than any of the other sorts by this method; the third, fourth, and fifth species will also sometimes succeed tolerably in fine dry seasons; but the first species, *Cucurbita lagenaria*, rarely ever comes forward enough to produce any tolerable sized fruit, unless forwarded at first by artificial warmth; and indeed all the other sorts of Gourd arrive much sooner to perfection, if brought forward at first in a hot-bed. However, in default of such

such conveniences, the seeds may be sown at the above-mentioned times in the natural ground, either in a warm border for transplanting, or at once in the places where it is designed the plants shall remain to fruit, chusing open ground in a sunny exposure, which should be well dug and formed into shallow holes, basin-like, as for the pickling cucumbers, at considerable distances, sowing three or four seeds, half an inch deep, in each hole; but, if you have any hot dung to spare, it would be of much advantage, in the places where you intend sowing the seed, to dig holes two feet wide, and fifteen inches deep, fill them with the hot dung, and earth it over six or eight inches deep; so forming the earth hollow, put in the seed as above; then, in either method of sowing, if there are any spare hand-glasses, it would also be of much service to place one over each hole occasionally in cold nights and bad weather; or, for want of these, may cover on nights with large garden pots, &c. whelmed over the holes, whereby the plants will come up sooner, and continue a surer growth than if fully exposed:—observing in general to leave only one or two of the best plants in each hole, giving plenty of water in dry warm weather, and they will spread themselves considerably in June and July, and produce ripe fruit in August and September.

But, as the principal merit of all these sorts of plants consists in their fruit, both for use and ornament, therefore, to have them in fruit as early as possible in summer, I should advise, where convenient, to sow and forward the plants in a hot-bed; that is, sow the seed in April in any of the cucumber or melon hot-beds, under glasses, &c. or, if sown separate in a moderate hot-bed under a small frame, or hand or bell-glasses, or oiled paper lights, they may be more readily hardened by degrees to the full air; and when the plants raised in either method are come up a few days, and have expanded their seed-leaves, they should be taken up and pricked down, either in the earth of the bed, about four inches distant, or rather in small pots, one plant in each, so plunging them in the bed; being careful, if in a bed by themselves, to admit a large portion of free air every mild day, to strengthen and harden them gradually, preparatory to their transplantation into the full ground, which is to be effected in May or early in June, when the plants have three, four, or five leaves, previously digging the ground, and forming shallow holes a foot wide, in the allotted places, and transplant the plants with a ball of earth about their

roots, one plant in each hole, giving directly some water;—and, to the tenderer sorts, the occasional shelter of a hand-glass, &c. on nights during the cold weather, will prove beneficial in forwarding the plants; let them, however, at any rate, have occasional shade the first week from the noon-day sun.

As, however, the first species, *Cucurbita lagenaria*, is rather more tender than the other sorts, it would be highly proper, in transplanting them, as above, where they are finally to remain, to indulge them still with a farther aid of artificial heat, and occasional shelter of glasses, otherwise they rarely come forward enough to produce fruit of any considerable size; therefore, in the allotted places dig holes two feet wide, and one and a half deep, filling each hole with hot dung, and earth them six or eight inches deep; put in the plants, and cover them with hand-glasses till their runners advance from under them, managing them nearly as directed for the hand-glass crop of cucumbers.

I would likewise observe, that as the Warted-Gourds, &c. are also rather of more tender quality than the Pompions, it is therefore also advisable, where there is hot dung and hand-glasses to spare, to treat them in their final transplantation as directed above for the *Cucurbita lagenaria*, by which practice you will obtain them in fruit much earlier in the summer.

All the sorts of these plants require a plentiful supply of water in dry weather, especially after they have begun to run. Let them, therefore, be duly supplied in dry seasons, and they will extend to a greater distance, and produce a great quantity of fruit.

When these fruit are designed to be used as culinary, for boiling, they should be gathered when quite young, while the outside tegument, or rind, is perfectly tender; they will then boil exceedingly soft, and have an agreeable flavour, though some of the smaller Gourd kind are also sometimes used when at full maturity.

To save seed of these species, it must be taken from the ripe fruit in autumn; the finest and the most perfect ripened fruit of August and September should be chosen, and the seeds divested of the pulp, as observed of the cucumbers and melons.

Second Head.

CUCURBITA-CITRULLUS, the Citrul, or Water-Melon, (*Citrullus*).

The *Citrullus* is now retained as a species of *Cucurbita*, according to the Linnæan arrangement, which, by some former botanists, was considered as a distinct genus, under the

way, large, lobated, rough leaves, and yellow flowers, succeeded by roundish, moderate sized, smooth fruit, of different forms in the varieties, and the shells become hard and woody.

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Therefore, the seed may either be sown in a moderate hot-bed about the middle of April, half an inch deep; and when the plants have three or four leaves, transplant them in May or early in June into the open ground, or upon holes of hot dung, under hand-glasses, &c. which will forward the plants considerably.

Or, for want of hot-beds, the seed may be sown in the full ground in the first or second week in May, but not sooner. The *Cucurbita Pepo*, or Pumpkin, in particular, succeeds rather better than any of the other sorts by this method; the third, fourth, and fifth species will also sometimes succeed tolerably in fine dry seasons; but the first species, *Cucurbita lagenaria*, rarely ever comes forward enough to produce any tolerable sized fruit, unless forwarded at first by artificial warmth; and indeed all the other sorts of Gourd arrive much sooner to perfection, if brought forward at first in a hot-bed. However, in default of such

such conveniences, the seeds may be sown at the above-mentioned times in the natural ground, either in a warm border for transplanting, or at once in the places where it is designed the plants shall remain to fruit, chusing open ground in a sunny exposure, which should be well dug and formed into shallow holes, basin-like, as for the pickling cucumbers, at considerable distances, sowing three or four seeds, half an inch deep, in each hole; but, if you have any hot dung to spare, it would be of much advantage, in the places where you intend sowing the seed, to dig holes two feet wide, and fifteen inches deep, fill them with the hot dung, and earth it over six or eight inches deep; so forming the earth hollow, put in the seed as above; then, in either method of sowing, if there are any spare hand-glasses, it would also be of much service to place one over each hole occasionally in cold nights and bad weather; or, for want of these, may cover on nights with large garden pots, &c. whelmed over the holes, whereby the plants will come up sooner, and continue a surer growth than if fully exposed:—observing in general to leave only one or two of the best plants in each hole, giving plenty of water in dry warm weather, and they will spread themselves considerably in June and July, and produce ripe fruit in August and September.

But, as the principal merit of all these sorts of plants consists in their fruit, both for use and ornament, therefore, to have them in fruit as early as possible in summer, I should advise, where convenient, to sow and forward the plants in a hot-bed; that is, sow the seed in April in any of the cucumber or melon hot-beds, under glasses, &c. or, if sown separate in a moderate hot-bed under a small frame, or hand or bell-glasses, or oiled paper lights, they may be more readily hardened by degrees to the full air; and when the plants raised in either method are come up a few days, and have expanded their seed-leaves, they should be taken up and pricked down, either in the earth of the bed, about four inches distant, or rather in small pots, one plant in each, so plunging them in the bed; being careful, if in a bed by themselves, to admit a large portion of free air every mild day, to strengthen and harden them gradually, preparatory to their transplantation into the full ground, which is to be effected in May or early in June, when the plants have three, four, or five leaves, previously digging the ground, and forming shallow holes a foot wide, in the allotted places, and transplant the plants with a ball of earth about their

roots, one plant in each hole, giving directly some water;—and, to the tenderer sorts, the occasional shelter of a hand-glass, &c. on nights during the cold weather, will prove beneficial in forwarding the plants; let them, however, at any rate, have occasional shade the first week from the noon-day sun.

As, however, the first species, *Cucurbita lagenaria*, is rather more tender than the other sorts, it would be highly proper, in transplanting them, as above, where they are finally to remain, to indulge them still with a farther aid of artificial heat, and occasional shelter of glasses, otherwise they rarely come forward enough to produce fruit of any considerable size; therefore, in the allotted places dig holes two feet wide, and one and a half deep, filling each hole with hot dung, and earth them six or eight inches deep; put in the plants, and cover them with hand-glasses till their runners advance from under them, managing them nearly as directed for the hand-glass crop of cucumbers.

I would likewise observe, that as the Wart-ed-Gourds, &c. are also rather of more tender quality than the Pumpions, it is therefore also advisable, where there is hot dung and hand-glasses to spare, to treat them in their final transplantation as directed above for the *Cucurbita lagenaria*, by which practice you will obtain them in fruit much earlier in the summer.

All the sorts of these plants require a plentiful supply of water in dry weather, especially after they have begun to run. Let them, therefore, be duly supplied in dry seasons, and they will extend to a greater distance, and produce a great quantity of fruit.

When these fruit are designed to be used as culinary, for boiling, they should be gathered when quite young, while the outside tegument, or rind, is perfectly tender; they will then boil exceedingly soft, and have an agreeable flavour, though some of the smaller Gourd kind are also sometimes used when at full maturity.

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Second Head.

CUCURBITA-CITRULLUS, the Citrul, or Water-Melon, (*Citrullus*).

The *Citrullus* is now retained as a species of *Cucurbita*, according to the Linnæan arrangement, which, by some former botanists, was considered as a distinct genus, under the

title of *Anguria*; but its characters being proved the same as the *Cucurbita*, or Gourd, it is properly a species of that genus.

Class, order, and character, the same as the *Cucurbita*.

There is but one species, viz.

CUCURBITA Citrullus.

Citrus, or Water Melon.] *Cucurbita*, with trailing slender stalks, branching into many runners, extending six or eight feet every way, ornamented with large leaves divided into many parts; and yellow male and female flowers apart, the females succeeded by large, round, smooth, green fruit, the flesh replete with a watery cooling juice; hence denominated Water Melon.

Varieties of this are,] Large, round, red-fleshed Water-Melon—Large, round, white-fleshed Water-Melon—Large, oblong Water-Melon—Small, round Water-Melon.

The large varieties of this fruit acquire a monstrous volume, frequently growing as large as half peck and peck measures; but these very large kinds rarely ripen in any degree of perfection in England; the most proper sorts, therefore, for English culture, are the smaller round kinds, which will ripen freely, and acquire a rich flavour, and of which there are both red and white-fleshed kinds.

The plants are tender herbaceous annuals, from the hot parts of the world, and nearly of the temperature of the *Cucumis Melo*, or Musk-Melon, and, like them requiring the aid of artificial heat and shelter, to bring the fruit to perfection in this country.

Their season of ripening in England is August and September.

These fruits, by their cooling and diuretic quality, are so very beneficial in hot climates, that they are greatly cultivated in Portugal, Spain, and the Levant; also in Persia and Egypt, and other parts of Asia and Africa, and the warm parts of America; in all of which countries they grow freely in the open ground, and ripen in the greatest perfection; and the ripe fruit are often imported into this country from Spain and Portugal, &c.

In England, however, notwithstanding our aids of artificial heat and shelter, this fruit, on account of its watery quality, and sometimes for want of proper culture, according to its nature, is often ripened but indifferently, which is the cause of its not being in general esteem. But by aid of substantial hot-beds, under constant shelter of frames and glasses, and the beds supported in a constant good heat, the fruit may be ripened in full perfection; which if effected in due time in autumn, whilst the warm weather continues,

to give it flavour, it is very delicious eating, and is accounted exceeding wholesome.

Propagation and Culture.

The propagation and culture of all the varieties of *Citrullus* is nearly the same as for the musk-melons: they are raised annually from seed sown in hot-beds, under frames and glasses, in February or beginning of March, as for the musk-melons aforesaid; and when the plants have come up a few days, prick them in pots (thirty-twos), two plants in each, plunging them in the hot-bed, observing to stop the plants also at the first joint; and when they begin to shoot runners, transplant them into a large hot-bed, also under frames and lights, where they are to remain to fruit.

As these plants are nearly of the same temperature and nature of growth as the cucumber and musk-melon, the same degree of hot-bed heat, method of sowing, raising, and nursing the plants, is here to be observed; and their whole management, in respect to giving air, covering the glasses on nights, giving water, and supporting the heat by linings, &c. is also exactly the same. The ridging out the plants into the fruiting hot-beds is also the same as the musk-melon, observing to make the hot-beds substantial, for one or more of the largest three-light frames; for, as the plants spread considerably, should have as much room as possible; earth the bed twelve or fifteen inches thick in hillocks; but as one hole of plants is sufficient for each three-light frame, therefore, lay only one hillock of earth just under the middlemost light, earthing the other parts only about three inches thick at present; so when the earth is warm, put in one pot of two plants in each hill of earth; though one plant, if it thrives, will sufficiently fill the frame, for they spread at a great rate, and unless they have full scope, they will make little progress in fruiting.

When they are thus ridged out, observe that as the glasses must be continued constantly on the frames, do not omit giving air at all opportunities, agreeable to the rules explained in the cucumber and melon frame culture; likewise cover the glasses every night with mats as for them directed; give also frequent moderate waterings, and earth the bed gradually to the depth of the hillock on which the plants stand, and conduct the vine and runners in proper directions, so as to fill all the places within the frame. The heat of the bed must also be supported with great attention, by proper linings of hot-dung: observe this all along, to forward the plants as much as possible; and this is particularly necessary, when

when the plants begin to show fruit, and whilst it is taking its first growth, until almost as big as a man's double-fist; for without a constant bottom heat till that period, it will be impossible to bring this kind of Melon forward enough to ripen in good perfection in England; therefore, let it be a rule to maintain a constant heat in the bed, as above, and continue the constant shelter of the glasses, tilting them all fine days, to allow a proportionable share of air; and in scorching sunny weather, a slight shade of a mat, or a little loose straw-litter, for two or three hours in the middle of the day will be necessary, together with a moderate portion of water once a week, or as it shall seem necessary; and with this culture, the fruit will readily attain perfection in any part of Britain, and before it is late in autumn; for unless they ripen in August and September, they will be devoid of flavour.

The aid of bark hot-beds would be very beneficial in the culture of this species, as we formerly observed in the musk-melon culture.

It must be remarked, that these plants can never be fruited in any degree of perfection under hand or bell-glasses, &c. as practicable for the latter crops of musk-melons.

With respect to the tokens of ripeness of these fruits, it must be remarked, that they seldom impart that very fragrant smell peculiar to musk-melons, nor, like them, do they often crack or recede from the foot-stalks; but they sometimes change a little yellowish, and the top becomes soft or pliable to the touch, and by smelling close to that part, they sometimes also discover their maturity by the emission of a little fragrance.

The saving seed of this species is, as observed of the musk-melons, to be effected always from the finest and most perfectly ripened fruit, treating it in the same manner.

CULINARY Plants. Plants or herbs that are used in the kitchen for boiling, stewing, or any other purpose in cookery.

CUNONIA consists of a bulbous rooted, green-house plant, garnished with sword-shaped leaves, and spathaceous, spiked flowers.

Class and order, *Decandria Digynia*.

Characters.] **CALYX**, a small, five-leaved cup. **COROLLA**, five sessile, oval, spreading petals. **STAMINA**, ten awl-shaped filaments, topped with roundish twin antheræ. **PISTILLUM**, a conic germen, with two subulate styles, and obtuse stigmata. **PERICARPIUM**, an oblong, pointed, two-celled capsule, containing many roundish seeds.

The species is,

CUNONIA capensis.

Cape Cunonia.] Hath a compressed, brown, bulbous root, with narrow, sword-shaped leaves about nine inches long, of a glaucous colour; from between these a round, jointed stalk arises about fifteen inches high, terminated by a loose spike of scarlet flowers coming out of a large sheath, which are succeeded by oblong capsules.

This plant is propagated by off-sets, when the leaves are decayed, planting the off-sets in pots, and managing them as other bulbous green-house plants. See also **ANTHOLYZA**.

CUPRESSUS, the Cypress Tree.

This genus consists of hardy, evergreen, and deciduous trees, of beautiful pyramidal growth, and are proper both as timber trees, and for ornamental plantations, being very picturesque in their general habit, extending their branches regularly all around from top to bottom of the stem, closely decorated with small, narrow, thick leaves, and from the axillas, oval-amentaceous male, and conic female flowers, succeeded by round scaly fruit, called cones. See **CONUS**.

Class and order, *Monœcia Monadelphica*.

Characters.] **CALYX**, male and female flowers apart on the same plant; the males an oval catkin, and the females a roundish cone, each of several scales, and each scale serving as a calyx to one fructification. **COROLLA**, no petals. **STAMINA**, no filaments, but several united antheræ at the bottom of each scale. **PISTILLUM**, a scarcely visible germen, and very short style. **PERICARPIUM**, none; the seed being involved only by the tough scales of the calyx, forming a roundish cone.

There are about four distinct species of these trees common to the British gardens, three evergreens and one deciduous; and one of the former admits of two beautiful varieties, differing in stature and habit of growth.

The species are,

1 *CUPRESSUS sempervirens*.

Evergreen Common Cypress.] Cupressus, with an upright straight stem, closely branching all around almost from the bottom upwards, into numerous quadrangular branches; obtaining, in the different varieties, from about fifteen or twenty, to forty or fifty feet stature, and very closely garnished with very small, narrow, erect, imbricated, evergreen leaves; and flowers and fruit from the sides of the branches.

Varieties of this are,

Evergreen common upright Cypress—arising from about fifteen to twenty feet high, and with all its branches assuming an upright direction, often growing in a close pyramidal form.

Evergreen horizontal spreading Cypress—arising thirty or forty feet high, and with all the branches spreading widely in a horizontal direction.

These varieties of *Cupressus sempervirens* are inhabitants of the Levant, and grow in great abundance in Spain and Portugal, also in the island of Crete, or Candia, where there are vast plantations of them, and are used as their most common timber, more particularly the horizontal kind, as being the largest grower, the timber of which is supposed to be of many hundred years' duration in any kind of buildings, for it is said to resist the worm, moth, and all putrefaction. The trees in general are also beautiful in their growing state, and so hardy that they prosper here in almost any soil, but are observed to be particularly thriving in any gravelly or sandy ground, and may be employed to great advantage in ornamental plantations for the embellishing gardens and parks. The first of these varieties was long the most common in England, and on account of its erect, close, pyramidal growth, was formerly trained into regular figures, by shearing it annually in summer.

2. CUPRESSUS pendula.

Pendulous Evergreen Portugal Cypress, or Goa Cedar.] Rises near twenty feet high, having all its branches spreading irregular and bending downwards closely, garnished with small, glandulous, imbricated leaves, and flowers and fruit from the sides of the branches.

3. CUPRESSUS Thysides.

(Thysides)—or *Evergreen arbor-vitæ-leaved American Cypress, sometimes called White Cedar.*] Cupressus, with an upright stem, branching out regularly into numerous ancipital, or two-edged branches, and arises twenty or thirty feet high, ornamented with small, flat, evergreen leaves, imbricated like arbor vitæ, and small blue cones the size of juniper-berries.

4. CUPRESSUS Disticha.

Distichous-leaved American Deciduous Cypress.] Cupressus, with an erect trunk, attaining a large bulk, branching wide and regular, and grows fifty or sixty feet high, fully garnished with small, spreading, deciduous leaves, arranged distichous, or along two sides of the branches. And, considered as a deciduous tree, makes a most beautiful appearance in summer.

The flowers of all these trees arise principally from the sides of the branches, but they make but little appearance, and the fruit is universally smallish, close, round cones, which, on large trees, sometimes ripen in England, though not always furnished with

good seeds; so they are commonly procured from abroad for sowing.

All these trees being beautiful in their general growth, and very ornamental in their very small, but closely placed foliage, are most proper to be employed in all ornamental plantations, and have a fine appearance either thinly grouped with other trees, on the sides of spacious lawns, or to border grand plantations; likewise to assist in forming detached clumps, or to be stationed here and there as single objects, or in small groups by themselves, of from two or three to five or ten of different sorts, in extensive lawns, parks, and other grass ground; they are also choice furniture to be employed in assemblage in forming rural avenues, and grand rural walks; and the evergreen kinds, by their pyramidal form, are peculiarly adapted for embellishing the grounds contiguous to ornamental garden buildings, temples, and other similar structures, in any part of pleasure-grounds; and single trees placed in large breaks or opens, in the excursions of spacious serpentine walks, are very ornamental.

As some of the sorts acquire a considerable stature and bulk, and arrive to timber, they may also be introduced among evergreen forest trees, in the most conspicuous parts of estates, to the emolument of the owner, as well as to improve the beauty and elegance of his plantations.

The season for planting, or transplanting these trees is the same as for other hardy evergreens, and those of the deciduous tribe. See EVERGREEN and DECIDUOUS TREES.

In their culture it is advisable to suffer them all to retain their natural growth, in which they will exhibit the more picturesque appearance.

Propagation of all the Sorts.

They are all raised abundantly by seeds; they will also sometimes grow by cuttings of the young shoots; but the seedlings make the handsomest plants.

The seeds are procured in their cones from the seedsmen, and by exposing them to a moderate heat, they readily open and discharge the seeds freely. The season for sowing them is any time in March, or early in April, and they grow freely on a bed or border of common light earth, especially the first and fourth species. Let the ground be then dug, well broken, and raked smooth, then drawing an inch of earth evenly from off the surface into the alley, sow the seed moderately thick, and with the back of a spade press it a little into the earth, then directly sift the earth over it, half an inch deep. The seed being

Being thus sown, observe, that, if in April and May the weather proves warm and dry, a very moderate watering will be now and then necessary, and the plants will rise in six or eight weeks; observing then, and during summer, to keep them clear from weeds, and in dry weather give them gentle waterings twice a week. In winter indulge them with occasional shelter of a frame or mats in time of hard frost. Thus continue your care till the second spring after they come up, when they will be two years old; then in March or April transplant them from the seed-bed into a sheltered situation, in nursery rows one or two feet asunder: and in three or four years they will be fit for the shrubbery, &c.

But if the seeds of these trees were sown in pots, tubs, or boxes, and plunged in a moderate hot-bed, under a frame or occasional shelter of mats, the plants will come up near a month sooner than those in the full ground; and as they will be forwarder in growth accordingly, they may be pricked out the following spring into the nursery.

As the *Cupressus Thyoides*, however, is sometimes a year after sowing before the plants come up, it may therefore be proper to sow the seeds in boxes, pots, or tubs, for the conveniency of removing them to the shade, to have only the morning sun during summer, and to a sheltered sunny situation in winter; and if the plants should not appear the first year, it would be of great advantage, in spring following, to plunge them in a hot-bed, as above observed; it will greatly forward the plants, so as to be fit to transplant the spring following.

Propagation by Cuttings.

This may be tried upon all the sorts, though as to the evergreen kinds, it is often two years before they are properly rooted. Choose the young shoots, plant them in October, or in March or April, in a sheltered situation, and give plenty of water the following summer. But the plants raised from cuttings will not obtain more than half the stature of those raised from seeds.

CUTTINGS. In gardening, Cuttings are a part of the branches of plants and trees, cut off and planted for the purpose of propagation.

Vast numbers of trees and plants may be increased by Cuttings; for, as a branch, or even the smallest twig of one, may be considered as a part similar to the whole plant, and that when separated, or cut from its parent, is devoid of a root, yet, being planted in earth, it in process of vegetation forms one, as well as advances with a stem furnished with branches, and produces leaves, flowers,

and fruit, exactly the same as the mother-plant, without the least variation.

Some sorts of plants are also propagated by Cuttings of their leaves, as in some sorts of *agave* and *aloe*.

Numbers of trees grow so readily by cuttings, that it is the only expeditious method for raising them; and the young shoots are the proper parts for planting: though some, as willow, poplar, and alder, will grow either by small Cuttings, of six inches to two feet long, or by large truncheons, a yard or more in length, and as thick as a man's wrist. And of the willow, Cuttings of the large pole-branches, two or three yards long, and two or three inches thick, planted in moist places, will readily grow.

But the proper parts of most other trees, shrubs, and herbaceous and succulent plants, for Cuttings, are principally the young shoots of one or at most two years' growth, though most trees and other plants succeed best by the one year's Cuttings, and planted in the autumn or spring after they are produced; and some sorts of hard-wooded plants succeed best by planting the same year's shoots in summer, as is observed under their respective articles, but generally in all herbaceous plants as grow by Cuttings, they must be of the same year's shoots of their young stalks and branches, and planted early the same summer, in May, June, or July; and Cuttings of succulent plants of one, two, or three years' growth will grow; generally planted in spring or summer, from April or May to July or August.

The proper lengths to take off the shoots, as Cuttings, are various, from about three or four to twelve, fifteen, or eighteen inches long, according to the nature of the plant, length, size, and strength of the shoots, of the respective sorts; all of which is explained in the culture of all the different kinds that are propagated by this method, each under its respective genus.

In choosing the Cuttings, always prefer shoots of the most firm, even growth, according to their nature, to the long, rambling, weakly shoots: prefer also those that are freest from side shoots; and in taking off the Cuttings, if they are of the smaller, ligneous, shrubby plants, such as the wall-flower, southernwood, sage, and the like, they may be slipped off with the hand from the side of the branch, though these are more properly slips than Cuttings (See SLIPS). And many of the smaller sorts of shrubs, both deciduous and evergreens, may be taken off in the same manner; but in the strong-shooting shrubs and trees, and in all succulent plants, the shoots

shoots for Cuttings should always be cut off, either lateral or terminal shoots, as they may occur convenient for the purpose: and in most herbaceous plants, the proper Cuttings, being principally of the flower-stalks, are generally cut off clean to the bottom, and, if very long, may be divided into shorter lengths for planting.

In taking off Cuttings, it is often of advantage, in the tree and shrub kinds, to cut them with an inch or two of the former year's wood adhering to their bottom, particularly the vine, laurel, and several others; which may be practised where convenient; but most shoots that will grow by Cuttings, succeed almost equally well without any of the old wood.

In preparing Cuttings previous to planting, trim off all side shoots; and all those, which have weak, tender, crooked, or straggling tops, as often occur in many of the deciduous trees and shrubs, should be topped, or shortened down to the firm straight wood; though those that have straight robust tops, according to their nature, may remain entire, particularly the evergreen kinds; and never top any Cuttings of succulent plants.

Many sorts of trees and shrubs that propagate by Cuttings, make very long one year's shoots, often long enough to admit of dividing into several lengths for Cuttings of ten or fifteen inches each, as in the vine, honeysuckle, jasmine, passion-flower, with many other deciduous climbers, and other trees; but I would observe, that the lower parts of these long shoots that are firm and well-ripened, cut off about eight or ten to fifteen inches long, are the most eligible for Cuttings; though the upper parts, if they have acquired a tolerably firm texture, may, in cases of scarcity, be also used in lengths as above, rejecting the weak straggling part toward the upper end; but the lowermost Cuttings generally make the best plants.

All Cuttings of trees, shrubs, and plants, that are not succulent, should be planted as soon as possible after they have been cut from the parent plant. But as to succulent Cuttings, they being mostly very replete with moisture, when first separated from the parent, the humidity continues to issue abundantly, often for several days at the cut part made in separation; and therefore, until that part is dried and crusted over, it is not proper to plant them, otherwise the moisture flowing out would cause them to rot in the earth.

With respect to the mode of planting, most Cuttings of trees, shrubs, and all other plants, not succulents, should be planted nearly two parts in three in the ground;

but succulents should be only just put as far into the earth as to make them stand, and is sufficient to root; for if planted too low, they are apt to rot, nor will they emit roots freely.

Some sorts of Cuttings grow freely in the common open ground; others require a shady situation, and some to be potted for occasional shelter; and others require the aid of a hot-bed, to promote their rooting; all of which is also fully explained, accordingly as the respective plants require, each under its proper genus.

Most sorts of Cuttings will be sufficiently rooted in one year, and some in one or two months, especially herbaceous plants and most kinds of succulents; also many sorts of tree and shrub kinds, more particularly so in such as are of the young wood of the same summer, and still more effectually if assisted by hot-beds, and even sometimes in the full ground, when planted in the young wood in summer.

As to the season for planting Cuttings, spring and autumn is the time for most sorts of trees and shrubs; and for herbaceous plants, such in particular as grow by Cuttings of their flower-stalks, as the scarlet lychnis, lychnidea, &c. and such as grow by young shoots from the bottom, as the carnation and pink, and those ligneous-herbaceous plants that grow by young shoots from the sides of the branches, as sage, rue, rosemary, wall-flower, generally succeed best in spring and summer, as soon as their shoots are of due size, in April, May, or June, as is directed for each sort in its proper place; but most succulents in particular succeed best by planting their Cuttings in summer, from about the middle of May till August, and they will be well rooted before winter.

All varieties of particular species of all sorts of trees that grow by Cuttings, may, by that method of propagation, be continued distinct, the same as by grafting, budding, and layering; for the plant raised from a Cutting will be exactly the same as the parent, and can never vary like seedling varieties. See VARIETIES.

As there are numerous sorts of trees and shrubs, both deciduous and evergreens, as well as many succulent and herbaceous plants, which grow by Cuttings, they are particularly mentioned in their proper places under their respective genera, and the particular method of managing each kind, in respect to their propagation by Cuttings, fully explained.

CYCLAMEN, Sow-bread, but commonly called *Cyclamen*.

This

This genus consists of many low, herbaceous, flowery perennials, of the tuberous-rooted tribe, consisting of a large, roundish, fleshy root, crowned by numerous, angular, and heart-shaped, spotted, marbled leaves, and many fleshy foot-stalks, six inches high, surmounted by monopetalous, five-parted, reflexed flowers.

Class and order, *Pentandria Monogynia*.

Characters.] CALYX is roundish, five-parted, and permanent. COROLLA is monopetalous, with a globular tube, the limb or upper part large, and divided into five spear-shaped, reflexed segments. STAMINA, five filaments, and straight acute antheræ. PISTILLUM, a roundish germen, filiform style, and acute stigma. PERICARPIUM, a globular, unilocular berry, opening in five parts at top, and many oval, angular seeds.

The species are,

1. CYCLAMEN *Europæum*.

European Cyclamen.] Cyclamen, with a large orbicular, depressed fleshy root, crowned by many orbicular-heart-shaped, crenated leaves, elevated about six inches on their own foot-stalks; and between them many fleshy, radical peduncles, six or eight inches high, terminated at top by reflexed flowers in spring and summer, succeeded by ripe seeds in June, July, or August.

Varieties.] Common Purple-flowered—White-flowered.

2. CYCLAMEN *hederifolium*.

Ivy-leaved Autumn Cyclamen.] Cyclamen with angular-heart-shaped leaves, purple underneath, marked with black on the middle; and fleshy flower-stalks six or seven inches high, terminated by reflexed flowers, appearing in August, September, and October; succeeded by seed-buds sitting close to the ground all winter, and ripen the following summer.

Varieties.] Ivy-leaved purple-flowered—White flowered—Round heart-leaved purple-flowered; all flowering in autumn, August, September, and October; the leaves rising about the same time, continue till May, then wither; and the seed-bud sitting close to the ground all winter among the leaves, ripens in June following.

3. CYCLAMEN (*hyemale*) *coulm*.

Winter-flowering Cyclamen.] Cyclamen with orbicular-heart-shaped, plane, entire leaves, and bright purple flowers appearing in winter and early in spring, and the seeds ripen in June or July.

Varieties.] Winter Cyclamen with angular leaves, and flesh-coloured flowers—With white flowers—With purple flowers.

This species and varieties of winter Cy-

clamen generally begin flowering towards Christmas, continuing about six weeks; and the leaves, which appear at the same time, continue in growth till summer, then decay, and the seeds ripen in July.

The plants being somewhat tender, should generally be allotted a warm border, or some planted in pots for moving to shelter of a frame or green-house in frosty weather, or all winter.

4. CYCLAMEN *persicum*.

Persian Spring Cyclamen.] Cyclamen with oval-heart-shaped, dentated leaves, beautifully veined and marbled with white; and white flowers with purple bottoms, in March and April.

Varieties.] Purple-flowered with crimson bottoms—Marble-leaved with red flowers—With entire white, sweet-scented flowers—With yellow flowers—With angular-heart-formed, marbled leaves, and white and purple flowers with crimson bottoms.

This last species, *Cyclamen persicum*, and varieties, produce delicately-pretty flowers in the spring, generally appearing in March, April, and May, being furnished with leaves at the same time, which continue till the beginning of June, then decay, and the seeds ripen in August. The plants are rather tenderer than the former sorts; they, however, will often succeed planted close under a warm wall; but it is also proper to have some in pots, to move to shelter of a green-house in winter.

General Description.

The roots of all these plants are large, depressed, fleshy lumps, emitting fibres at their base. The flowers and leaves of all the varieties arise immediately from the root, on their own proper foot-stalks, about four to six or seven inches high; one flower generally crowns each stalk, each divided into five segments, reflexed backwards; and when the flowers fade, their stalks shrink spirally to the ground and envelope the seed-bud, and sit close to the earth among the leaves, increasing to a large, round, baccaceous fruit, or seed-vessel, ripening, as before observed, in June, July, or August.

All the species and varieties, though of humble stature, are very ornamental, both in their variegated large foliage, and their beautiful flowers, some of which are very fragrant, especially of the vernal kind, which are also commonly the most beautiful; but all the sorts merit admission in every curious collection.

The first two species and varieties may be planted in any of the common borders; but most of the other sorts should either be station-

ed close under a warm wall, and sheltered with mats, &c. in hard frost, or potted and placed in a frame or green-house for the winter. They should all have a dry light soil, otherwise the root is apt to rot by wet.

As the leaves of all the sorts decay in May and June, that is the only proper period for removing the plants either for increase by dividing the root, or to plant them into fresh prepared earth, or to transplant them from one place to another, &c. but as the roots do not lose their fibres, like some other tuberous roots, and most kinds of bulbs, they should not be often removed.

Propagation, &c.

All the sorts are propagated by seeds, and the particular varieties by dividing their roots.

By seeds — They grow freely in common earth; but it will be three, and sometimes four or five years before some of the seedlings will produce flowers; there is, however, this consolation, that the flowers will be large and fine, and often some new varieties. Let the seed therefore be sown soon after it is ripe, at least in August or September, in boxes, tubs, or large wide pots of rich light earth, and cover it half an inch deep; so place the pots, &c. to have only the morning sun till October, then placed in a warm, sunny exposure, and at the approach of bad weather remove them under a hot-bed frame, to have occasional shelter of the lights; but expose them fully every mild day. By this care some of the hardiest sorts will probably appear towards Christmas, or before, but all of them in spring, observing in warm dry weather to give moderate waterings till their green leaves decay in summer; at which time place them to have only the morning sun, as before, till October; then sit half an inch of fresh earth over the surface, continuing to defend them from frost in winter; and in summer following, when their leaves fade, transplant them where they are to remain, some in the full ground, and some of the tender kinds in pots, and in a year or two after some of them will begin to flower.

By dividing the roots — They make but small progress of increase by the root; however, the root may be divided by cutting it into two or three pieces, which must be done in summer, planting them again directly, and they will each flower at its respective season.

CYDONIA, the Quince Tree. See PYRUS.

CYMA, Cyme, a mode of inflorescence in the manner of aggregate flowering, somewhat resembling an umbel.

The Cyme is properly a bunch or aggregate of many small flowers, growing mostly to an

equal height; and consists of a number of foot-stalks or peduncles, proceeding from one common centre of the general receptacle and rise to the same height, like an umbel, as before said, but differing from the umbel, in that the secondary or partial collateral foot-stalks from the main peduncle arise without any regular order; though generally the whole together form nearly an even surface at top, as before intimated, either flat, as in elder, and laurustinus, or roundish, as in guelder-rose, &c.

CYNARA, Artichoke and Cardoon.

Of this genus are two eminent species for the kitchen garden, the Artichoke and Cardoon, both hardy, herbaceous plants; the former perennial, and the latter rather biennial, in England.

Class and order, *Syngenesia Polygamia Æqualis*.

Characters.] CALYX, compound flower, having a ventricose general calyx, composed of numerous broad scales. COROLLA, numerous tubular, hermaphrodite florets, each five-parted at top. STAMINA, five capillary filaments in each floret, and cylindrical antheræ indented in five parts. PISTILLUM, an oval germen to each floret, slender style, and oblong, emarginated stigma. PERICARPIUM, none. SEMEN, a four-cornered seed, crowned with down.

Of the garden Artichoke there is but one real species, and of the Cardoon the same; but of the Artichoke there are two principal varieties.

The species of Artichoke is,

CYNARA *Scolymus*.

(*Scolymus*) — or the Garden Artichoke.] Cynara, with large, thick, perennial roots, crowned by a considerable cluster of large, pinnatifid, erect leaves, two or three feet long, and in the midst upright stalks a yard high, surmounted by a large, round, scaly head, being composed of numerous, oval, calycinal scales, inclosing the florets, sitting on a broad, fleshy receptacle, which, as well as the fleshy base of the scales, is the only eatable parts of the plant.

Varieties of this are,

Conical-headed green French Artichoke — having the folicles of the leaves commonly terminated by small spines, a tall stalk, the head somewhat conical, and of a light-green colour, and with the scales pointed at top, opening and turning outward.

Globular-headed red Dutch Artichoke — having leaves without spines, a strong stalk, the head large, globular, a little depressed at top, and of a reddish-green colour, broad, obtuse scales emarginated at top, growing close, and turning inward.

Of

Of these two varieties the globular-headed kind is deservedly in most esteem, being considerably larger than the conical-headed Artichoke; and its eatable parts, both of the bottom and scales, are considerably more thick and fleshy, as well as more agreeably flavoured, and should therefore be principally cultivated both for family and market.

Both the varieties are perennial in root; but the leaves and fruit-stem die to the ground in winter, and their roots remaining, send up new leaves, and a supply of Artichokes every summer, for many years, if required. The conical green-headed sort is rather the hardiest to resist the power of severe frost.

The flowers and seed of all the plants of this genus are produced in the centre of the head, the scales of which are the proper general calyx of the flower, which, being compound, consists of numerous small bluish florets, succeeded by downy seeds sitting naked on the receptacle.

The Culture; and first of their Propagation, and Method of planting.

Both the varieties of Artichoke are propagated always by suckers or off-sets arising annually from the stool or root of the old plants in spring, which are to be taken from good plants of any present plantation, in March or beginning of April, and planted in an open quarter of the kitchen-garden, in rows five feet asunder, all as hereafter directed, and they will produce Artichokes the same year in autumn; the same plants enduring many years, they continue producing a fresh crop annually in summer.

It however should be remarked, that although Artichokes are of many years' duration, yet their annual produce of fruit will, after the third or fourth year, be every season smaller and less fleshy in the eatable parts; so that a fresh plantation should be made every three or four years: but, in order to obtain a longer succession of heads during each season, I should advise to make a small plantation annually, whereby you will have a regular supply of fruit several months, i. e. from June till November; for the old plants of one or more years' standing produce their heads in June and July, and are mostly over by the latter end of August; at which time, the young plantation of the same year takes place, producing fine large heads, continuing to come in gradually till November; therefore, by planting a few every spring, you have, besides the long succession of fruit, a crop always ready to succeed the old ones, when, by their declining in production of good heads, you shall think proper to eradicate them;

which, when intended, may be done in autumn, after they have yielded their summer crop; at which time, observing, that if you shall have occasion for many young plants as soon as possible in spring, some of the best of these old stools may, in October or November, be trenched in close together, in some dry warm place, under a hedge, or any fence open to the full sun, raising the earth up about the young shoots; and in winter, when hard frosts prevail, cover with long dung litter, and thereby you will have a chance of obtaining good plants for a new plantation, if the severity of the winter should destroy or much injure those of the standing crop in the open quarters of the garden; however, this is only mentioned to be practised occasionally, when a large supply of young plants may be required; as in general, when the winters are not very rigorous, the standing plantations commonly furnish a plentiful supply of young suckers in the spring for planting; so that the above old stools may only be retained occasionally.

The suckers, off-sets, or young plants, either of any standing plantation, or of the old roots above mentioned, are generally to be taken off for planting in March; and sometimes, in very backward seasons, or after hard winters, it will be the beginning or middle of April, before they are large enough for that purpose, which should be from about six, eight, or ten inches to a foot long. For the method of slipping or taking them off for planting, see the method of their *Spring Dressing*.

With respect to situation and soil for these plants, they should have a free exposure; the more distant from spreading trees the better, which would draw them up weak; and as to soil, they prosper in any common soil of a kitchen-garden, capable of producing tolerable crops of other esculent plants, though they are the most prosperous in a somewhat moist soil; but, if possible, avoid planting them in wet ground, as in such the plants would be in danger of rotting, or subject to great injury in winter; and having fixed on the ground, lay thereon a considerable coat of rotten dung, spreading it equally over every part; then trench the ground one good spade deep, besides the top paring or shovelling, and each trench two spades wide; as you proceed, bury the dung equally in the bottom of the trenches.

The ground being thus prepared, then get the plants, such as above mentioned, and prepare them for planting; observing to make choice of such of the shoots or suckers only as are best furnished with some fibres to

their roots; taking these one by one, cut off any very hard or knobbed part at bottom, rejecting such as are very tough and stringy, and trim the outer leaves down about one third or near half way, so as the central ones have full liberty to expand. Being thus trimmed, let them be directly planted by line and dibble, in rows five feet asunder, and the plants two feet and a half distance in each row, inserting each plant three or four inches deep in the ground, closing the earth well about the root and body of the plant as you proceed in planting; and immediately let every one be watered, for this will settle the mould close about them, fix every one firmly in its place, and promote their early rooting; observing, if the weather at this time proves dry, to repeat the waterings every two or three days, for a week or a fortnight, till they have taken fresh root, and begin to grow.

After this, they require no further culture during summer than to be kept clean from weeds, which is readily done by hoeing with a large hoe between the plants in dry weather. And in the beginning of winter the ground must be ridged up along each row, to defend the plants from frost. See the *Winter Culture*.

In making a plantation of Artichokes as above; if necessary to make the best advantage of every compartment of ground, may sow some small temporary crops between the rows the first season; such as a crop of round spinach, radishes, or lettuce, &c. sowing the seed broad-cast and raked in; and when these come off in June, may then plant a row of coleworts, cabbage, or savoys along the middle space, to come in for autumn service.

Their Culture when in Fruit.

The plants of the new plantation will begin to show their fruit or heads the beginning of August, and will be in the fullest perfection from about the middle of that month to the latter end of September; and sometimes they continue fruiting gradually until November; but next year the same crop will come into fruit in June and July, and be mostly all over in August; so that, as already noticed, if you would continue a succession annually from June to November, always plant a few every spring, to come into fruit the same year to succeed those of older plants.

But with respect to the care of the plants when in fruit, observe, that, besides the principal or top fruit, several collateral small heads often arise from the sides of the main stem, which side-shoots, or suckers, being displaced, the whole nourishment is consequently directed to the principal head; therefore if you

prefer one large handsome head to three or four small ones, the above culture should be constantly practised, from time to time, before the side-heads exceed the size of a hen's egg.

These small side-heads or suckers are by many greatly esteemed, being cooked in various ways, and served up to table; and the London gardeners having great demand for them, they gather them as they are produced, and tie them in bunches for market.

But some persons, not anxious about having very large heads, suffer the above-mentioned side-shoots to remain, rather preferring three or four middling ones, from the same stem, in successive order, to only one large fruit.

The maturity of the Artichoke heads is, when arrived to their full magnitude, discoverable by the scales diverging from each other considerably, but before the centre or crown opens, to show an effort for flowering.

When the heads are to be gathered, you should cut them with six or eight inches of the stalk at least; but if for market, almost three times that length.

But as the heads are gathered, the whole stalk should always be broken down close to the ground, being necessary to the welfare of the plants, by encouraging their stools, as much as possible, to produce some new shoots more freely before winter.

Their Winter Dressing, and landing up to protect them from Frost.

The winter culture of Artichokes is principally to land or earth up the rows, to guard the crown of the root and young shoots from severe frost, which is done by digging the ground, and forming the earth into a ridge along each row over the roots; without which precaution, the inclemency of the winter often proves destructive to those plants.

This work should be done in November, or beginning or middle of December, according as the weather continues more or less mild.

In the first place, cut down all the large leaves near the ground, preserving only those of the central young shoots; and this may be done any time in November; then, at the time above mentioned, proceed to dig the ground between the rows, and work it up close to the plants, in a sort of ridge, along each row. But the most regular way is, if the plants are in close rows for a full crop, i. e. in rows five feet asunder, range a line exactly along the middle of each space between the rows; then with the spade chop the ground along according to the line; and thus you

you form beds five feet broad, one row of plants ranging along the middle of each such bed; then dig the ground, bed and bed long-ways, a moderate spade deep, gradually working the earth from each side towards the middle in a ridge along the row of plants, as above observed, so as each row stand exactly in the middle of every such ridge of earth; rearing the earth close about the plants, but not quite over their tops; and this will greatly shield the crown of the root and young shoots from the effects of hard frosts.

But when the rows of Artichokes are ten feet distant, as in many of the kitchen-gardens, for the sake of obtaining other crops between, you may then either ridge up the plants, in five-feet wide beds, as above directed, or trench all the ground in the common way, in ridges two or three feet wide, ranging the way of the rows, and digging them one spade deep; and as you advance to each row of plants, land them up, by forming a good ridge along the row, that each row stand in the middle of a ridge of earth, as in the other method.

However, instead of landing up the plants in either of the above methods, should not omit drawing some earth, with a hoe or spade, up close about the plants, and at the approach of severe frost, add a covering of long dung litter, or some light, dry, mulchy material; though some never land, nor draw any earth about them at all, only mulch the plants in December, or towards Christmas, or sooner, if hard frosts set in, laying some shortish dry mulch about each hole of plants, bringing it close round about the shoots, and let it remain all winter, till danger is past; either of which methods is indeed often sufficient in our ordinary winters; but as there is no knowing what weather will happen, so it is not always to be depended on; and there is nothing more effectual for the benefit of the plants, than ridging up the earth about them, as before directed.

Remember, however, that if the frost in winter should prove extremely severe, it is also advisable to lay over each ridge a covering of any kind of long, dry, mulchy litter, which, together with the ridge of earth, will effectually secure the plants.

Likewise observe, if rigorous frosts set in before you have time to land the plants, do not fail, in that case, to lay a thick covering of dry litter over them.

All coverings that have been occasionally used during hard frost, should be removed in February, or at least as soon as the weather breaks; and in March or beginning of April

the ridges of earth should be levelled down, and the plants have their spring dressing as follows.

Their Spring Dressing, by levelling down the Ridges, and displacing the superabundant Shoots.

In March or beginning of April, according to the forwardness of the season, when the plants have made some tolerable shoots above ground, the ridges of earth, landed over them in winter for their protection, should be levelled down, and all superabundant and ill placed shoots cleared away, leaving only two or three of the most promising suckers upon each stool.

Taking opportunity of dry weather for this work, dig or level down the ridges of earth length-ways, row and row, stirring all the ground between and close about the plants; and as you proceed, remove the earth from about the crown of the root and young shoots, as low as the part of the stock from whence they arise: then, if there are several shoots, fix upon two or three of the straightest, most promising, and best situated on each root, toward the lower part of the stool, at some distance from each other; let all the rest be cleared away, by slipping them off close to the root, and directly turn in the earth again about the remaining shoots, closing the earth well around them, and press it gently between, to preserve them as far distant from each other as their situation will admit, and trim off any broken or dangling leaves; and in this manner treat every stock, as you advance in digging or laying down the ridges, observing to level the ground in a neat manner; and if you chuse, the spaces between the rows may be sown with spinach, &c. or any light crop, as observed at the time of making the plantation.

But I would remark of this spring-dressing, that if in March you find the stocks shoot weakly, occasioned by hard frost or much wet, it will be proper, only for the present, to open and loosen the earth, and level down the ridges a little, to encourage the roots; and in three or four weeks after, when they have made tolerable shoots, may slip them as above, and dig and level the ground properly.

The young shoots which are slipped off in the above spring-dressing, are, as before observed, the proper plants wherewith to make new plantations; a proper quantity of the best should therefore be reserved, making choice of such as are straight, from about six, eight, or nine inches, to a foot long, and whose bottoms cut free and crisp, rejecting such as are very tough, woody, and hard, at the base.

The sooner they are planted after being separated from the old plants, the better; but if the ground should not be ready, lay them till then, by the roots, in a trench, placing them upright, for if placed *flanting*, they, by assuming an upright growth, would become crooked.

When they are to be conveyed to any considerable distance, they should be packed dry, in small bundles of eight or ten, wrapping dry hay about them, and tying each bundle with a hay-band, and pack the several bundles in hampers or large garden-mats; when they arrive, place the roots in water a few hours previous to planting.

Of manuring the Plants.

Such plantations of Artichokes as are permitted to remain several years in the same place ought to have the ground manured every other year, with some thoroughly rotten dung, applying it in November; at the time of landing up the plants, and dig it in one good spade deep.

By this practice a plantation of Artichokes will continue in good condition, and bear tolerable heads for several years; though, as they grow old, the heads will be smaller in proportion.

Second Species of Cynara, the Cardoon.

The Cardoon, in its general habit, greatly resembles the Artichoke plant, but is of larger and more upright, regular growth; the leaves taller, broader, and more deep and pinnatifidly divided; and the stalks of the leaves, blanched, are the only eatable parts of the plant.

There is but one species, viz.

CYNARA Cardunculus.

Cardunculus, or Cardoon.] *Cynara*, with thick, fleshy, fibry roots, crowned by a considerable cluster of large, erect, deeply-pinnatifid leaves, four or five feet high, having all the lobes pinnatifid, and thick prickly foot-stalks; and amidst them, upright tall stems, terminated by scaly, small Artichoke-like heads, furnishing flowers and seed, but not any eatable substance in that part, as in the Artichoke.

This plant is often biennial in England, arising from seed in spring, obtains perfection in autumn and winter, shoots up stems in spring after, flowers in July, ripens seed in September, and the whole often dies the winter following in this country; but it rarely produces good seed here, so it is commonly procured by the seedsmen from France, Spain, and Portugal. The plant is large, regular, and of noble appearance in its general growth.

The stalks of the leaves being thick, fleshy, and crisp, are the eatable parts, first blanching

them by landing up like celery, two feet to a yard long, to render them white, tender, and agreeably flavoured, which otherwise would be rank and bitter; they are in perfection in autumn and winter, and are used for fallads, soups, stewing, and other culinary purposes.

Though, as these plants are not in any general estimation in this country, only in some particular families, they may be cultivated less or more, or as required, according to the demand of a family, or for market; for which latter, they are raised in some principal kitchen gardens in the vicinity of London, and brought to Covent Garden, and some other markets of that metropolis, generally bound in bunches, three plants in each, and sold at three or four to five shillings or more per bunch.

The plants being of considerable growth, require to grow in rows five feet asunder, and four distant in the rows.

Propagation and Culture.

It is propagated by seed sown annually in the full ground in March, either in a bed for transplantation, or at once in the place where you design the plants shall stand to come to perfection.

The following are the directions for both methods of culture.

First by transplantation.—Sow the seed in March, or beginning of April, by broad-cast, in a bed of rich earth; tread it in, and rake the ground, and when the plants are three inches high, thin them to four or five inches distance, that they may not draw each other weak; and in June they will be fit to transplant: in the beginning or middle of June, therefore, prepare an open space of ground by manuring and digging, or that has been dunged in the preceding winter or spring; draw lines five feet distance, and put in the plants by dibble, at four feet distance in the lines, either on level ground or in drills, or hole them in wide bason-like holes, eighteen inches over, and five or six deep, making the sides sloping, and set one good plant upright in each hole; give water directly, which repeat, if dry weather, every evening or morning till they have taken root; after this, all they require is hoeing the ground occasionally to kill weeds, until the end of September or October, when the plants will be arrived nearly at full growth, so as the leaves of the different plants will almost meet, and those of each plant are then to be tied together, and landed up to blanch them, as hereafter directed.

By sowing where they are to remain.—Let the ground be marked out in lines five feet distance, as in the transplanting method; then, along each line, form bason-shaped holes, eighteen

eighteen inches wide, and two or three deep, the holes four feet distant from centre to centre in the row; in each hole drill in three or four seeds, ranging the way of the row, covering them half an inch deep: give occasional waterings in very dry weather; and when the plants are come up three or four inches high, thin them to one of the strongest in each hole; at the same time clear away weeds, and stir the earth with a hoe about each remaining plant; and thus the plants remaining where sown, not receiving any check by removal, they establish their roots firmly from the beginning, will grow more freely and stronger than those which are transplanted, and sooner arrive to full size, with large stalks, in fine order for general blanching.

These plants are cultivated in wide rows, on account of their large growth, as well as for the convenience of having a sufficient portion of earth to land them to a due height, i. e. two or three feet, for in rich ground they often grow four feet high, and it is necessary to land them up, for blanching, above half their full length.

All the culture necessary for these plants during their growth till fit for blanching, is to keep them clean from weeds, by hoeing the ground.

As these plants stand at considerable distances from each other, you may have some small temporary crops between the rows the first three months, such as spinach, lettuce, endive, cabbage, savoy, or broccoli plants, for transplanting, &c. observing to keep the holes of Cardoons perfectly clear from every thing.

Method of landing them for blanching.

Generally in September and October, the Cardoons will be grown very large, and their foot-stalks have acquired a thick substance; you must then tie up the leaves of each plant, to admit of landing them up closely all around, for blanching, which will be five or six weeks in effecting, and the plants will come in for use in November and December, and continue all winter.

But if the plants are required for use as soon as possible in autumn, the blanching may be begun in August, so as to have the plants for use towards the latter end of September and October; performing this first landing by applying the earth in a broad basis round the lower part of each plant; but afterwards, when more fully grown, must tie the leaves together, preparatory to a full landing a more considerable height.

The method is, first, having hoed and cleared the ground from weeds, then having procured some hay-bands, proceed with these materials,

on a dry day, to tie up the leaves of each plant close and regularly together around, by degrees, almost to the top; this done, dig and break the earth, and as you proceed, bank it up close round each plant nearly as high as the tying or bandage, smoothing it with the back of the spade, both to fix it properly, and that it may readily shoot off the falling wet; observing, if the plants should advance more in height, to continue the tying of hay-bands higher in proportion; for it is necessary to have them tied up nearly their full height, both to blanch them more effectually, and secure them from injury of severe frost.

To obtain a more regular succession, the landing may be performed at different times, allowing the distance of a fortnight between each time of landing.

In six weeks the plants are sometimes tolerably blanched, but in two months they are generally in excellent order.

They may be continued all winter, with the care of covering the tops of the plants with long litter during hard frosts.

To save Cardoon seeds.—Cultivate a few plants in a sheltered sunny place; let them stand unblanched, protecting them from frost with light litter; they will shoot up in spring following, flower in July, and if a fine warm dry autumn, they will ripen seed towards Michaelmas.

CYNOGLOSSUM, Hound's Tongue.

It furnishes hardy herbaceous biennials, perennials, and annuals, for medical use, and as flowering plants for ornament in gardens.

Class and order, *Pentandria Monogynia*.

Characters.] CALYX is oblong, five-parted, and permanent. COROLLA is monopetalous, funnel-shaped, five-parted at the brim, and the chaps closed. STAMINA, five filaments, and roundish antheræ. PISTILLUM, a four-parted germen, permanent style, and indented stigma. PERICARPium, none; the calyx supplying its place, containing four seeds.

The material species are,

1. *CYNOGLOSSUM officinale*.

Officinal, or Common Hound's Tongue.] Cynoglossum, with large, thick, blackish roots, crowned by large, oval-spear-shaped, hoary leaves, and amidst them, upright firm stalks two feet high, adorned with narrow close-fitting leaves, and terminated by reddish flowers, in June and July.

Varieties.] White flowering Hound's Tongue—Evergreen Hound's Tongue.

This species and varieties may be considered both as biennials and perennials, because in moist soils they often die soon after they have perfected seeds; but in dry gravelly soils,

soils, the roots are often of several years' duration.

It grows wild under hedges, and is chiefly valued for its root in medicine.

2. *CYNOGLOSSUM Omphalodes*.

(*Omphalodes*)—*or Perennial Venus' Navel-wort.*] Cynoglossum, with slender trailing stalks, creeping and rooting at every joint, heart-shaped smooth leaves, on long foot-stalks; and from the axillas of the stalks, bright blue flowers in loose panicles, appearing in March, April, and May.

3. *CYNOGLOSSUM limifolium*.

Flax-leaved Annual Hound's Tongue, or Common Venus' Navel-wort.] Cynoglossum, with upright, slender, branchy stalks, six or eight inches high, garnished with long, very narrow, smooth, greyish leaves; and all the branches terminated by loose panicles of small white flowers, in June and July.

4. *CYNOGLOSSUM lusitanicum*.

Portugal Annual Hound's Tongue, or Taller Venus' Navel-wort.] Cynoglossum, with upright branchy stalks ten or fifteen inches high, garnished with spear-shaped rough leaves, and all the branches terminated by loose spikes of white flowers, in June and July.

The flowers of all these plants are, singly, of one funnel-shaped petal, are small but pretty numerous, which in the first, third, and fourth sorts, are succeeded by plenty of seeds.

Of these four species, the second, third, and fourth sorts, are those that merit culture as flowering plants, and are pretty ornaments for the fronts of borders, &c. the two latter of which have been long inhabitants of our gardens, in the collection of hardy annuals.

They are all hardy, and prosper in the open borders.

Propagation.

The first species may be raised by sowing the seed in any soil in autumn or spring, and they will rise plentifully in March or April.

The second species propagates itself abundantly by its rooting stalks, cuttings of which may be taken off with roots, in spring, summer, or autumn, and planted where they are to remain.

The two annual sorts are always raised from seed in spring, sown in patches in the borders where they are to flower, sowing several seeds in each patch a quarter to half an inch deep; and when the plants come up, occasional water and weeding is all they require; and by two or three different sowings, they will flower from June till the end of summer.

CYPRIPEDIUM, Lady's Slipper.

It consists of four species of hardy herbaceous perennials for ornament, growing erect

about a foot high, garnished with large oval leaves, and crowned by large, quadripetalous, nectarious flowers.

Class and order, *Gynandria Diandria*.

Characters.] *CALYX* is a spatha. *Corolla*, four or five long, spear-shaped, expanded, erect petals, and in the midst a large, swollen, roundish, hollow nectarium. *STAMINA*, two short gynandrous filaments, and erect antheræ. *PISTILLUM*, a long contorted germen, short style, and obsolete stigma. *PERICARPIMUM*, an oval, trigonous, three-furrowed, unilocular capsule, and numerous seeds.

The species are,

1. *CYPRIPEDIUM Calceolus*.

(*Calceolus Maria*)—*or Common Lady's Slipper.*] Cypridium, with thick, fleshy, fibrous, creeping roots, sending up, in spring, several upright robust stalks a foot high, adorned with large, oval-spear-shaped, ribbed, close-fitting leaves, placed alternate, and surmounted by a spatha, protruding a large flower, expanding its four petals cruciform, having in the centre a large hollow nectarium; the whole very elegant, and of different colours in the varieties.

Varieties are,] Common Lady's Slipper, with yellow flowers—Deep-purple flowers—Pale-purple flowers—Golden flowers—Red flowers—Large yellow flowers—Variable flowers.

This species and respective varieties are perennial in root, but the stalks and leaves rise annually in spring, and decay in autumn, and all the sorts flower in June; are extremely ornamental, and their structure singularly curious, particularly in their large, swollen, roundish nectarium, which is feigned to resemble a slipper, or, rather, a wooden shoe; hence the plants derived the name.

Of the above varieties, some grow wild in many of our shady woods, &c. the others are originally of America; and they all highly merit culture, both as plants of curiosity and ornament.

2. *CYPRIPEDIUM album*.

White-petaled Lady's Slipper.] Cypridium, with fibrous roots, sending up in spring several upright stalks, a foot high; garnished with ovate-lanceolate, cauline, ribbed leaves, placed alternate, and embracing the stem, which is topped with a spatha, protruding a four-petaled white flower, with a large purplish-red nectarium.

3. *CYPRIPEDIUM bulbosum*.

Bulbous Lady's Slipper.] Cypridium, with a roundish bulbous root, crowned by radical roundish leaves; and between them erect, low stalks, terminated each by one large flower, having an oblong nectarium.

4. *CYPRIPEDIUM*

4. *CYPRIPEDIUM acaule.*

Acaulous, two-leaved Lady's Slipper.] *Cypripedium*, with a bulbous root, from which arise two oblong-pointed leaves, between which issues a very short stalk, supporting the flower, having a large, roundish, inflated, hollow nectarium of a purple colour.

These species, &c. are perennial in root, but annual in stalk and leaves.

The flowers of all the sorts appear the end of May or in June, all of them composed of four or five large expanded petals, and a very conspicuous inflated nectarium in the centre; succeeded by ripe seeds in August, and they soon after decay to the roots.

They are very hardy, and delight in a somewhat moist undunged soil, open only to the morning sun. They succeed either in the full ground or in pots.

Propagation, &c.

The first and second species and varieties, having knotty, fibry, creeping roots, may be propagated by dividing or taking off joints, side off-sets, slips, or parting the roots in autumn, as soon as the stalks decay.

The bulbous sort is also increased by off-sets of the roots when the stalks decay.

All the species may also be raised from seed sown in autumn in a shady border, and the plants will flower the second or third year; especially if suffered to stand where they were sown.

These plants should not be often removed, which would retard their flowering.

CYRTANTHUS.

This genus furnishes us with bulbous-rooted perennials for the green-house, producing spathaceous, umbellate, long, funnel-shaped flowers, of considerable beauty.

Class and order, *Hexandria Monogynia.*

Characters.] CALYX, a diphyllous, oblong, spatha-like involucre. COROLLA, tubulous, clavated, and curved, having a long tube; the top cut into six segments, slightly reflexed. STAMINA, six long filaments inserted in the tube, and connivent at the tops, with oblong antheræ. PISTILLUM, an ovate germen in the bottom of the corolla, slender style, and trifid stigma. PERICARPIUM, an oblong, trilocular capsule, having seeds.

The species are,

1. *CYRTANTHUS angustifolius.*

Narrow-leaved Cyrtanthus.] Hath a bulbous root, crowned by strait, narrow, keel-shaped leaves, closing at their base; and flower-stalks one foot high, terminated by umbellate clusters of scarlet nodding flowers, between two and three inches long each.

2. *CYRTANTHUS obliquus.*

Oblique-leaved Cyrtanthus.] Hath a fleshy bulbous root, smooth oblique leaves, and umbellate pendulous flowers, terminating a foot-stalk about one foot high.

The roots of these plants are perennial; the stalks annual, round, and succulent, crowned by a spatha protruding the umbels of flowers; each separate flower formed of one long tubular petal, divided at the extremity in six parts; of singular beauty; appearing in June or July.

They are propagated by off-sets of their roots when the flowers are decayed, or from seeds sown in the spring, and forwarded in a hot-bed, and may be afterwards treated as other bulbous-rooted plants kept in the greenhouse.

CYTISUS, Tree-Trefoil. (*Laburnum*, &c.)

This genus furnishes some elegant flowering shrubs, both deciduous and evergreens, of hardy growth, for the pleasure-ground, adorned with trifoliate, oval, and oblong leaves, and long spikes of yellow papilionaceous flowers.

Class and order, *Diadelphia Decandria.*

Characters.] CALYX is bell-shaped, short, and divided into two lips, the upper one bifid, and the under one three-parted. COROLLA is papilionaceous; the standard oval, rising, and reflexed on the sides; the wings obtuse, and the length of the standard; and the keel-bellied and acute. STAMINA, ten diadelphous filaments, and simple antheræ. PISTILLUM, an oblong germen, simple style, and obtuse stigma. PERICARPIUM, an oblong, blunt pod, narrow at the base, and kidney-shaped seeds.

There are about five species of *Cytisus* in the English gardens, three of them deciduous shrubs, and one or two evergreens.

The species of our gardens are,

1. *CYTISUS Laburnum.*

The Laburnum, or Large Deciduous Cytisus.] *Cytisus*, with a large upright tree-stem, branching into a full-spreading head, twenty or thirty feet high, having smooth greenish branches, trifoliate, oblong-oval entire leaves, on long slender foot-stalks; and from the sides of all the branches, numerous yellow flowers collected in long spikes, hanging loosely downward, appearing in May.

Varieties of this are.] Common broad-leaved *Laburnum*—Narrow-leaved, long-spiked *Laburnum*, having very long pendulous spikes of flowers—Short-spiked *Laburnum*, having short, roundish, thick spikes of flowers—Variegated-leaved *Laburnum*. The first two of which varieties are tolerably permanent from seed, but the other two must be continued by cuttings, or layers.

All these varieties are deciduous, but their leaves

leaves appear early in summer, which, together with their numerous, long, pendulous spikes hanging from every part of the branches, appear very ornamental, and are well adapted to place on the borders of woods, wildernesses, and large shrubbery plantations, on the boundaries of lawns, parks, &c.—And, although they are generally considered only as ornamental shrubs, if encouraged by training them to a stem at first, and suffered to stand, they will form moderate-sized timber-trees: they grow naturally on the Alps, the mountains of Dauphiné, and in the Highlands of Scotland; and the timber being very hard, and taking a fine polish, is frequently used for making chairs, tables, bedsteads, and other furniture, which are said to equal the finest mahogany in beauty.

The trees are so very hardy, that they will prosper any where, and are of very quick growth.

2. *CYTISUS sessilifolius*.

Scfile-leaved Deciduous Cytisus.] *Cytisus*, with a low shrubby stem, branching into numerous, erect, brownish branches, forming a bushy head five or six feet high, garnished with small, trifoliate, oval leaves, some on very short foot-stalks, others sitting close, and bright yellow flowers in short erect spikes at the ends of the branches; appearing in June.

3. *CYTISUS nigricans*.

Black Cytisus.] *Cytisus*, with a short shrubby stem, dividing low into many erect slender branches, forming a bushy head four or five feet high, trifoliate, oblong-oval, dark-green leaves; and yellow flowers, terminating all the branches in erect spikes; appearing in July.

4. *CYTISUS hirsutus*.

Hairy Evergreen Spanish Cytisus.] *Cytisus*, with an upright, shrubby, grey stem, sending out many erect, greenish, hairy branches, forming a full head six or eight feet high, closely garnished with small, trifoliate leaves, having oval, hairy folioles by threes, on short foot-stalks, and yellow flowers from the sides of the branches in short pendulous spikes, having vivid hairy cups; appearing in June.

This species being rather impatient of very severe frost, should have a dry soil, and sheltered situation in the shrubbery.

5. *CYTISUS austriacus*.

Austrian Evergreen Cytisus.] *Cytisus*, with a shrubby stem, dividing low into many greenish branches, forming a bushy head three or four feet high, closely garnished with trifoliate, oblong-oval, smooth, whitish-green leaves, and bright yellow flowers, in close umbellate heads at the ends of the branches,

having a cluster of leaves under each head; appearing in May.

Variety.] *Austrian Cytisus*, with smaller leaves, naked flower-stalks, and smaller flowers.

These five species have universally trifoliate leaves, i. e. three folioles on each foot-stalk.

The flowers of all the sorts are papilionaceous, or butterfly-shaped, or of the pea-bloom form; and appear numerous in long succession, in the different species, from May and June till July or August; and are succeeded by oblong pods, containing plenty of ripe seed in autumn.

All these shrubs have great merit in ornamental plantations, either to assist in forming clumps or continued shrubberies; their numerous trifoliate leaves being finely adapted for effecting variety in assemblage; and during their bloom, they appear covered with flowers.

The large sorts, such as the several varieties of *Laburnum*, should be stationed rather backward in clumps, and other shrubbery works; and the other four species should occupy places more towards the front, and in the most conspicuous departments.

They should all be suffered to retain their natural growth, except only cutting off any very irregular shoot or branch.

All the sorts are hardy, and will prosper in any common soil and exposure; though, as the *Cytisus hirsutus* is sometimes affected by severe frost, it should have a dry soil, and somewhat sheltered situation; also some kept in pots, for moving to green-house or frames in winter.

Propagation.

All the sorts are raised plentifully by seed, and some sorts by cuttings.

By seed.—The seed grows freely in the full ground, and should be sown in March, in four-feet beds, either drilling it in, half an inch deep, or sow it on the surface, and cover it that depth with earth; they will come up in six or seven weeks; keep them weeded during summer, and in winter it may not be amiss to protect the *Cytisus nigricans* and *Cytisus hirsutus*, by occasional shelter of mats, during severe frost; and in spring following, the seedlings in general, if they stand very close, may be transplanted into nursery-rows, at moderate distances; allowing them more room as they advance in growth; and here they may remain two, three, or four years, till large enough for the shrubbery.

By cuttings.—Most of the deciduous sorts will also succeed this way; and October and November,

November, or February and March, is the best time for planting them. Chuse young shoots eight, ten, or twelve inches long, plant them in rows a foot apart, and five or six inches in the lines; and they will be rooted in one year.

Likewise by layers—may propagate most

of the sorts, in the quite young wood of the year in summer, autumn, or spring.

All the culture these plants require in the nursery, is to keep them clear from weeds, and to dig the ground annually between the rows, till they are of proper growth for final transplantation.

D.

D A P

DAIS, an ornamental, greenhouse, deciduous shrub, producing umbels of monopetalous, funnel-shaped, purple flowers.

Class and order, *Decandria Monogynia*.

Characters.] CALYX, a four-leaved involucre, with scarious erect folioles. COROLLA, monopetalous, funnel-shaped, the tube long and slender, and the border cut into five lanceolate, obtuse, spreading segments. STAMINA, ten filaments inserted in the chaps of the tube, alternately shorter, and topped with simple antheræ. PISTILLUM, an oblong germen, growing at the base of the corolla; the style is slender, arising beyond the mouth of the tube, and topped with a globose stigma. PERICARPIUM, an oval berry of one cell, containing an oval seed.

The species is,

Dais cotinifolia.

(*Cotinus-leaved Dais*) Rises two or three feet high, garnished with oval, pointed, deciduous leaves, growing by pairs, and the branches terminated by an umbel of star-shaped purple flowers.

With us it is a scarce plant, owing to the difficulty of propagating it, as it rarely produces perfect seeds: there is no other method of increase, but by cuttings or layers, which seldom succeed well.

Dais is properly a greenhouse plant, and flowers in the summer.

There is another species or rather variety of Dais, which differs from the above in the number of stamina and divisions of the corolla.

DAPHNE, Spurge Laurel, and Mezereon.

This genus consists of low ornamental

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shrubs, of the evergreen and deciduous tribe, adorned with spear-shaped leaves, and small, but numerous, monopetalous, four-parted flowers.

Class and order, *Octandria Monogynia*.

Characters.] CALYX, none. COROLLA is monopetalous, funnel-shaped, and divided into four oval, spreading segments. STAMINA, eight short filaments inserted into the tube, and erect bilocular antheræ. PISTILLUM, an oval germen, short style, and a capitated, depressed stigma. PERICARPIUM, a roundish unilocular berry and one seed.

There are several species, but not more than five common to the English gardens, and which are the most beautiful and the only sorts that demand particular attention in horticulture.

The species are,

1. DAPHNE *Laureola*.

(*Laureola*)—or *Spurge* or *Wood Laurel*.]

Daphne, with many greyish-coloured stalks from the root, branching irregularly three or four feet high, closely garnished with long, narrow, spear-shaped, smooth, shining, evergreen leaves, sitting close to the branches; and from the upper parts, numerous, small, yellowish-green flowers in clusters, succeeded by oval berries, ripening to a black colour; flowers in January and February, and the seeds ripen in June.

Variety.] Variegated leaved *Laureola*.

2. DAPHNE *Mezereum*.

(*Mezereum*)—commonly called *Mezereon*.]

Daphne, with a short, strong, woody stem, branching out low into many erect branches, forming a regular bushy head, four or five feet high, garnished with small, oval-spear-shaped,

deciduous leaves about two inches long, and the upper parts of all the branches and young shoots closely adorned with numerous flowers, by threes, coming out early before the leaves, of different colours in the varieties, and succeeded by many roundish berries, in some yellow, others red.

Varieties.] Mezercon with white flowers and yellow berries—Purple flowers and red berries—Pale-red flowers and red berries—Crimson flowers and red berries—With variegated leaves, striped with yellow.

3. *DAPHNE Tarton-raire.*

(Tarton-raire)—or Silvery-leaved Daphne.] Daphne, with many whitish stalks from the root, branching irregularly a foot high, garnished with oval, nervous leaves, with their under parts of a silvery hue, sitting close to the branches, and from the axillæ of the leaves, numerous small white flowers in clusters appearing in May or June, but produce no seeds in this country.

4. *DAPHNE Cneorum.*

Dwarf-trailing Daphne.] Daphne with short, trailing, woody stalks, about five or six inches high, garnished irregularly, with small lanceolate leaves of a dark green; the flowers are produced in clusters at the extremities of the branches, and are of a purple colour, with an agreeable scent, appearing most of the summer months.

5. *DAPHNE odora.*

Sweet-scented Daphne.] Daphne with small shrubby stalks, garnished with smooth, oblong, lanceolate, sparsely leaves, and short, terminal, subsessile, multiflorous heads, appearing in winter. This species being a native of China, requires the protection of the green-house in winter.

The flowers of all these species and respective varieties consist each of one four-parted petal, very small, but numerous, and those of the Mezercon are the most conspicuous and beautiful; all the sorts flower early, and are succeeded by many berries, each furnishing one seed; ripe in June and July.

The first species, *Daphne Laureola*, is an inhabitant of our woods, and being a hardy and delightful little evergreen, is peculiarly adapted for wilderness and wood-works in gardens, as it will flourish under larger shrubs and the drip of trees; is also proper for any other shrubbery departments; no weather hurts it, and it remains always green.

The second species of Mezercon and varieties are all deciduous, but flower remarkably beautiful in February and March before the appearance of leaves, every shoot being covered with flowers, are extremely ornamental

at that early season, as well as very diffuse in a most agreeable fragrance; and when they fade, the leaves advance, and the berries continue their growth, ripening in June and July; which have also a pretty effect in forming variety, but are generally soon devoured by the birds.

The several varieties are proper ornamental furniture for gardens of any extent, and should occupy the most conspicuous parts of shrubbery works contiguous to lawns, principal walks, and places near the habitation.

Every part of these shrubs is of a remarkable hot quality, particularly the root, which is used in medicine.

The third, fourth, and fifth species, less common than the two former, are very curious little plants, will increase the variety in a collection very agreeably, and flower abundantly and ornamentally in their respective seasons, as above; but being rather tender, some should be potted for removing into a green-house or garden-frame in winter; and the fifth sort particularly should generally be managed as a green-house plant.

Propagation.

The first and second species are raised with facility from seeds, i. e. the berries which the shrubs furnish in great plenty, if secured from birds, by netting them, as soon as they begin to ripen.

The seeds grow freely in the common ground, and the best time for sowing them is in autumn, soon after they are ripe; and there will be a chance of their coming up the spring following, otherwise, when not sown till spring, they often remain a whole year before they germinate. Having procured the berries, dig a bed of light earth, and rake it fine; then, either draw an inch of earth off the surface, and sow the seed, and cover them over with earth, or draw flat drills that depth and six inches distance, sow the berries therein, earth them over as above, and smooth the surface.

The plants will appear in April or May; keep them weeded all summer, and in autumn or spring following, if they should stand very close in the seed-bed, the largest may be transplanted; otherwise they may remain until the second autumn till October; then plant out the whole in the nursery, in rows eighteen inches distance, to remain till two or three feet high, and are then fit for the shrubbery.

The other species are also propagated by seeds procured from abroad; these must be sown in a hot-bed, and when come up, planted singly in small pots, and protected from severe weather in winter.

DATURA,

DATURA, Thorn Apple, formerly *Stramonium*.

This genus furnishes some herbaceous, large, erect, flowery annuals for the pleasure-ground, rising three or four feet high, branchy, and adorned with very large, oval, and heart-shaped leaves, and considerable funnel-shaped flowers.

Characters.] CALYX is monophyllous, oblong, tubular, ventricose, five-angled, and indented in five parts. COROLLA is monopetalous, funnel-shaped, having a long cylindrical tube, a pentangular spreading limb, rising at the angles into acute points. STAMINA, five awl-shaped filaments, and oblong compressed antheræ. PISTILLUM, an oval germen, erect style, and thick obtuse stigma. PERICARPIUM, an oval, bilocular, quadri-valvular capsule, and numerous kidney-shaped seeds.

There are about four species in the British gardens, all of them annual, and of erect strong growth, rising each with a single luxuriant stem, dividing into many spreading branches.

The species are,

1. DATURA *Stramonium*.

(*Stramonium*)—or *Common Thorn-Apple*.] Datura, with an erect, strong, round, hollow, green stalk, branching luxuriantly a yard high, having the branches widely extended on every side; large, ovate-irregularly-angulated, smooth, dark-green leaves; and from the divisions of the branches, large white flowers singly, succeeded by large, oval, prickly capsules, growing erect, commonly called Thorn-Apples.

This is often found wild upon dunghills, but is sometimes cultivated in gardens for variety: where, if the seeds are suffered to scatter, numbers of young plants will rise naturally for several years after.

2. DATURA *Tatula*.

(*Tatula*)—or *Great Purple-stalked Stramonium*.] Datura, with an erect, large, purple stalk, branching four or five feet high, and widely on every side, large, heart-shaped-angulated, indented, smooth leaves; and, from the axillas of the branches, long purple flowers singly, succeeded by oval, spinous, erect capsules.

Variety.] With white flowers.

3. DATURA *Metel*.

(*Metel*)—or *White African Thorn-Apple*.] Datura, with an erect, large stalk, branching two or three feet high, large, heart-shaped, almost entire, downy leaves, and, from the axillas of the branches, long, widely expanded, pure white flowers singly, succeeded by spinous, drooping capsules.

Variety.] With double flowers.

4. DATURA *Fastuosa*.

Fastuous Egyptian Thorn-Apple,—or *Double Purple Stramonium*.] Datura, with an erect, purple, shining, smooth stalk, branching three or four feet high, large, ovate, sinuated, smooth leaves, and, from the axillas of the branches, large widely-expanded flowers, purple without, and pure white within, succeeded by globular, drooping capsules, set with many blunt tubercles.

Varieties.] With large double flowers, most beautiful—with semi-double flowers—and with white flowers.

The flowers of all these annuals are universally of one large funnel-shaped petal, having a long tube and spreading pentagonal limb, succeeded by large roundish capsules the size of middling apples, which being closely set with sharp spines, derived the name Thorn-Apple.

They all flower in June, July, and August, and are succeeded by capsules in autumn, furnishing abundance of seeds.

The first and second species are hardy, and easily raised in the natural ground.

But the third and fourth sorts are tender, and require to be raised in a hot-bed, and from which, either transplanted into pots, or in the borders of the pleasure-ground.

The species in general may be considered as plants of ornament, though the first sort often becomes a troublesome annual weed; but this and the second might be introduced in large borders, and other similar compartments for variety; and the third and fourth species, and respective varieties, being extremely beautiful in their flowers, demand admittance in the collection of curious annuals. See ANNUAL PLANTS.

Propagation, &c.

They being all annual, must be raised every year from seed. The hardy sorts may be sown in autumn or spring, in the borders and other compartments of the pleasure-ground where you design they shall flower; sowing them in patches four or five seeds in each, half an inch deep; and when the plants come up, thin them to one of the strongest in each patch.

But the third and fourth sorts, being of the tribe of tender annuals, must be sown in March, or early in April, in a hot-bed, under frames and glasses, in common with other tender annuals, such as balsamines, egg-plants, marvel of Peru, &c. See ANNUAL PLANTS. When they come up, admit air daily by tilting the lights; and in April, or when the plants are two or three inches high, prick

some singly in pots, and plunge them also in a hot-bed, as directed for amaranthus tricolor, cock's-comb, &c. to forward them, and draw them up tall; others may be pricked in the earth of the hot-bed, six inches distance; and in June, the whole should be moved into the open air, placing those in pots to adorn fore-courts, &c. and the rest may be taken up with balls, and planted in the compartments of the pleasure-garden. See ANNUAL PLANTS.

DAUCUS, the Carrot.

This genus furnishes several herbaceous species, but of which only one claims esteem for general culture in gardening, which is a biennial esculent, most valuable for its large eatable root, and which is the *Daucus Carota*, or Common Carrot; the others, having but little merit either for use or ornament, are rarely cultivated.

Class and order, *Pentandria Digynia*.

Characters.] CALYX, an umbellate flower, composed of many smaller umbels, the general umbel having a many-leaved involucre, which for the partial umbels is more simple and short. COROLLA, a radiated, difform, general umbel, having numerous florets, each composed of five heart-shaped, inflexed petals. STAMINA, five filaments, and simple antheræ. PISTILLUM, a small germen under each floret, two reflexed styles, and obtuse stigmas. PERICARPIUM, none. SEMEN, a small, two-parted, hairy fruit, each having two seeds.

The species denominated Carrot is,

DAUCUS Carota.

(*Carota*)—or *Common Carrot*.] *Daucus*, with a large, long, taper, perpendicular root, fifteen or eighteen inches long, crowned by many long, erect, finely-divided leaves, and when it shoots for seed, an upright stalk, branching out three or four feet high, having all the branches terminated by large white umbels, in May and June, succeeded by hairy seeds in August.

Of this species there are several varieties, in respect to the colour of the root, though there is only one sort in general esteem.

Varieties are,] *Carota* with an orange-coloured root, commonly called *Orange Carrot*—With a shorter red root, called *early horn-carrot*—With a purple root—With a yellow root—With a white root—all of them wholesome for eating; but the first variety is the principal sort for the general crops; and the second is sometimes adopted for early sowing; but the other three are only stragglers, accidentally occurring.

They are all biennial, rising from seed one year, and obtain perfection; and the next

they shoot up into stalk, produce flowers and seed, and the root soon after dies.

Of these varieties, the first sort, *Orange Carrot*, is that which is the most proper for general culture; it grows longer, larger, and commonly of more handsome growth than the others; as, when cultivated in a light, loose, deep soil, they often grow fifteen or eighteen inches long in the eatable part; and from two to three or four inches diameter at top, diminishing gradually in size to the lower end; but as one method of culture suits the whole, a few of the others may also be raised by those who are fond of variety, as they are all easily raised in any quantity from seed annually, sown at almost any time of the year, though the spring is the proper period for sowing the general crops.

The principal season of Carrots is from June until Christmas; but by different sowings, as hereafter mentioned, they may easily be obtained throughout the year.

Propagation and Seasons for sowing.

All the varieties are propagated by seed annually in spring; or, to obtain a greater succession, may be sown at three or four different times of the year; observing, however, that the principal sowing season is from about the middle of February to the latter end of March, being the only proper period for sowing the main or general crop; but may also sow successfully in April, for a full crop; and if a principal crop is sown in February or March, a smaller portion might be sown in April, by way of succession: and from which times of sowing you furnish a supply of Carrots from June till March or April following.

However, when young Carrots are required as early as possible, and a succession of such to be continued during summer and autumn, &c. four different sowings should be performed; or to obtain a small crop in the most early season, it may be effected by means of a hot-bed; but shall first proceed in the natural-ground culture, in the following order.

A first early sowing may be performed about Christmas, if mild, open, dry weather; otherwise, any time in January, or beginning of February, as soon as the temperature of the season is tolerably favourable: generally allotting, for this early crop, a dry, warm, south border of rich earth, or some other dry, sheltered compartment of light, mellow ground; sowing the seed in the usual method as hereafter directed; and the crop will come in for drawing a young growth in May, and early in June; but as these early-sown crops are not always so successful as those

those of the February, March, or April sowing, no considerable space of ground should be sown, only a small or moderate portion to obtain a few early in young growth, two or three weeks before those of the general crop.

The principal sowing for the main crop may be performed about the middle, or latter end of February, or beginning or middle of March, but not later than the latter end of that month; though, as before intimated, sowings of carrots in April and May will also succeed in tolerable perfection; but the roots will not be so large, especially those sown in May, which will scarcely acquire half the size; therefore observe the proper time as above, of February, March, or beginning of April, for sowing the principal general crops, as from which sowings we may obtain good Carrots from June till March following; that is, it will furnish fine young Carrots in June and July, but will be of a handsome large size in August, and by the end of September or October, they will be arrived to full perfection, which in November should be taken out of the ground, and preserved in sand for winter and spring use, because, if left longer in the ground after being arrived at full growth, they, in some moist soils, would be apt to canker, and rot away in winter.

One or two small or moderate sowings in summer would also be eligible where a succession of young Carrots are particularly required:—a sowing in May will furnish a young crop to draw in July and August, &c.—and a sowing performed about the middle of July, will be productive of a supply of young, handsome-sized Carrots, about the latter end of September or October, continuing in perfection in November, December, &c.

And, a sowing performed about the middle of August, to stand the winter, comes in for an early spring crop; the plants coming up in September, continue a slow growth all winter, till retarded by frost; and then, if sheltered in very severe frosts by a light covering of dry long litter, just to preserve their tops or leaves entire, will be of much advantage, and you will obtain young Carrots in March and April, or till those of the early spring-sowing come in: these autumn-sown Carrots, however, are apt to be tough and sticky; but as they come at an early season when young Carrots are a rarity, they are, therefore, nevertheless always acceptable both for family use and in market, and with which the London gardeners supply the markets plentifully from March until May, or till the arrival of the early spring-sown crops.

But respecting the above different sowings, I would observe they are not all in general absolutely necessary, only on the particular occasions already explained for each crop; as one or two full principal sowings in February or March and April, for the main crops, will furnish a plentiful supply in good perfection, in young, middling, and full growth, during the whole season of Carrots, from June, July, throughout the autumn, and winter months till the spring; so that, agreeable to these intimations of the requisite general and occasional different sowings, the necessary supply for a family or market may be suited accordingly.

Early Carrots may also be obtained by aid of artificial heat. See their *Culture in Hot-beds*.

Of the proper Soil for them, and its Preparation.

The soil most proper for Carrots is that which is light, loose, and of some considerable depth; and if inclinable to a sandy nature in a moderate degree, it will be an advantage; it is therefore necessary always to chuse a spot of the lightest and deepest soil in the garden, and such as hath been heretofore enriched with proper manure, observing, if it has been dunged the preceding year, it is more eligible than dunging it the same season, as fresh-dunged land is apt to promote what is called worm-eaten, or a sort of canker in the roots of the Carrots; but where the ground is so poor, that you conceive dunging is necessary, use that which is thoroughly rotted, and spread it evenly over the surface of the ground to be trenched in regularly, well broken and divided, not left lumpy to impede the straight perpendicular growth of the Carrots.

As to situation, an open exposure free to the sun and air, as distant from spreading trees as possible; should be chosen, especially for the main crops, which should always be in the large open quarters.

The necessary space of ground to sow for family service is, for the main crops, from one, two, or three, to fifteen or twenty rod; according to the extent of the family.

The ground should be trenched one full spade deep at least; but, where the depth of proper staple will admit, it is advisable to trench it two moderate spades depth; for as Carrots often strike two feet perpendicularly into the ground, they consequently require a considerable depth of loose soil, whereby the swelling part of the root will be long, straight; and of large size; observing likewise, that it would be of additional advantage to have the ground

ground trenched up in rough ridges during the winter, two or three months before the sowing season, that it may be well meliorated by the weather, which will be particularly beneficial for the early and general crops; and at sowing time, it is soon levelled down for the reception of the seed: it is also of much importance in trenching the ground to take but thin spits, and break all large clods, so as the parts may be well separated or divided, that the roots may have full liberty to perform their perpendicular growth; for when obstructed in that by the too great compactness or lumpiness of the earth, they grow short, branch or divide into forks, and become very irregular.

Having, however, prepared the ground either by immediate trenching when wanted, or if it was ridged up, as above, in winter, then, at the sowing-season, take advantage of dry fine weather to level it down for sowing, stir every part, and preserve a level surface; and, as soon as the ground is thus prepared, if the surface is not wet, but will readily rake without clogging, directly sow the seed, at least the same day, while the earth is fresh stirred, and before rain falls to wet the surface and render it cloggy, or before the surface is too much dried by the sun and wind; and the following is the method of sowing.

Method of sowing the Seed.

Always, if possible, procure new seed of the former year's sowing, for that which is more than one year old never grows freely; the necessary quantity is, at the rate of about a pound and a half to an acre; so that, for the largest family garden, a quarter of a pound is sufficient.

It must be sown by broad-cast, or scattered as equally as possible all over the surface of the ground, and raked in.

A calm dry day must be chosen for sowing this seed, otherwise, being of very light substance, the wind would blow it away; but previous to sowing it, as, besides its being of the above light nature, it adheres closely together by its rough hairy borders, it is proper to mix therewith some sand or fine dry mould, rubbing the whole between the hands, both to separate the seeds, and cause the sand to adhere a little, to render them more weighty; by this means you will be able to sow it more regularly, which otherwise would be apt to fall in heaps; then having prepared the ground as before directed, sow the seed on the surface, moderately thin, and directly rake it in; or the ground may previously be formed into four or five feet wide beds, having spade-wide alleys between, which may be necessary in moist or heavy soils, or when it is designed

to thin out the Carrots by degrees for use; so may stand in the alleys to sow and rake in the seed, also to weed or hoe the crop, and to thin out the young Carrots occasionally for use, without treading on the beds to bind the earth too close. But where the ground is light, loose, and dry, the seed may be sown all over the piece; then tread the ground over evenly with the feet almost close together, taking short steps, being necessary both to bury the seed more equally, and settle the ground evenly in every part, that when you stand thereon to rake in the seed, the feet will not sink in holes, in which the seed would be unavoidably drawn in raking; therefore, as soon as the seed is sown, and trodden in as above, rake the ground over evenly with a large wide-toothed rake, either a wooden or iron one; raking once or twice in a place is sufficient; and as you go on trim off all large stones and rough stubborn clods; leaving an even surface.

The seed being thus sown, it, if good, will soon germinate, and the plants will appear in fifteen or twenty days, and sometimes in a little less or longer time, according to the season of sowing, nature of the soil, and temperature of the weather. When they are two or three inches high, they must be thinned to several inches distance, and cleared from weeds, agreeable to the following directions.

Culture of the Plants.

When the young plants are come up about two or three inches high, they should be thinned to about six, eight, or ten inches distance, according to the size you intend they shall grow, and at the same time must be well cleared from weeds.

This work may either be performed by hoe or hand; but hoeing is not only more expeditious, as, by loosening the surface of the earth about the young plants, it will prove a very essential service in promoting their progress of growth. A small hoe two or three inches wide should be used; and dry weather should be chosen for performing the work, that the superabundant plants and weeds, as they are hoed down, may die; for if done in moist weather, many would strike root as they lie, and grow again. In the course of the work, be careful to thin the plants regularly to five or six inches distance at least, which may be sufficient for such part of the crop in which the Carrots are designed to be used while young, and thinned out by degrees for use; but in those intended wholly to stand to acquire full growth, hoe them at once to six or eight inches distance, singling out the most promising

ing to stand, and leave no where two or more together; observing to cut up all weeds, and stir every part of the ground between all the standing plants.

In a fortnight or three weeks after, as you shall see occasion, run over them again with a hoe, to cut up any straggling superfluous plants that escaped you in the first hoeing, cutting up also all weeds, and the plants will soon after cover the ground, and require no farther culture.

In a month, or five or six weeks after the first hoeing, you may expect young Carrots fit to draw, which, if much wanted, may begin drawing when they are the size of your little finger; beginning with those which were left close on purpose for thinning, and thin them out for the table as they are wanted, in a regular manner, so as the remainder may have room to arrive at full growth.

But when it is designed to begin drawing Carrots for table when quite young, it is advisable, exclusive of the main crop, to sow a piece purposely for drawing; and when fit to hoe, thin them only four or five inches distance, and in May or June, when of due size for the table, by a gradual thinning out the largest for use, the others will gain more and more room daily; and thus a piece of Carrots may be continued in occasional drawing till the main crop is arrived nearly at full growth in August and September, and which may be taken up clear as they come to hand.

Therefore, to have the principal crop of Carrots as fine as possible, they, when fit for hoeing, should be hoed to the full distance at first, of six or eight inches, as before observed, and suffer them to stand until August or September, before you begin drawing, when they will be long, large, and of handsome growth, and in October or beginning of November will be done growing, and should be then mostly taken up and laid in sand for winter, as hereafter directed; which, where there is convenience to lay them, is the only method by which Carrots can be preserved in due excellence during that season.

Preserving them in Sand during Winter.

To preserve Carrots in good perfection through the winter, the full-grown crops should be mostly taken out of the ground in November, when they have done growing, and the leaves begin to turn yellow and decay; and lay them in sand in a dry place, out of the wet, and the reach of frost.

This is necessary for these reasons, first, that, if permitted to remain in the ground in winter, they would be attacked by vermin,

and become cankerous and rotten, and in moist fat soils will often waste away to nothing: likewise, if they remained in the ground in winter, hard frosts prevent you digging them up when wanted; but by taking the roots out of the ground in autumn, they may be preserved perfectly sound till March or April following, and will be ready for use in all weathers.

They should be taken up in dry weather, with a three-tined fork, and spread regularly on the ground for a few hours to dry; then cut their leaves off close, and clear off all adhering earth, and carry them into a dry shed, cellar, or other room, where they may be sheltered from wet and frost; there lay them in dry sand, first laying some sand, then a layer of Carrots, then more sand, and so proceed alternately, several layers one upon another, and as wide and long as convenient, in proportion to the quantity of roots to be thus preserved; covering the whole a foot thick with straw.

By the above practice Carrots may be preserved in fine condition till April, both for family use and market.

Raising them early in Hot-beds.

Young Carrots may be obtained at an early season by aid of hot-beds; therefore if you omitted an autumnal sowing in the full-ground, for early spring service, or that those are damaged in winter, recourse may be had in January or early in February to a sowing on a hot-bed, either under frames or occasional shelter of mats.

Make the hot bed of hot dung, four feet wide, as long as convenient, and two feet high, and directly frame it, and put on the mould eight or ten inches deep; or, for want of frames, may arch it with hoops to be covered with mats, first earthing the bed the above depth with light rich mould, and fix boards or a wreath of large straw-bands round upon the edge of the bed on the top of the dung to keep up the outside earth, or it might be banked up closely on each side and end with moist soil, as practised for asparagus hot-beds: then having levelled and smoothed the earth for the reception of the seed, sow it evenly on the surface, and beat it lightly down with the back of the spade, and then sift some fine mould over it a quarter of an inch thick: this done, either set on the frame and glasses, or, in want of these, arch the bed over with hoops, and every night and all severe weather cover it with mats, or, if you use a frame and glasses, the plants must be allowed the full air every mild day, by raising, or throwing off the lights; for the plants must not be

kept close, otherwise they would draw up weak and never swell at root, so must only be covered principally on nights, and very severe or cold-cutting weather.

When the plants are come up, and have two or three leaves an inch high, thin them by hand to three inches distance, which will be room enough, as they will be mostly drawn off for use while quite young.

They may be greatly forwarded in growth, by lining the bed on each side with hot dung, in a fortnight or three weeks after it is first made, and so repeat it once or twice more, according as the heat declines.

By this practice of raising Carrots in hot-beds, a few may be obtained for variety, a month at least sooner than any in the natural ground.

Raising them in Fields.

Field culture of Carrots is sometimes practised for feeding cattle, and sometimes in large quantities for the supply of markets, and either of which differs but little in culture from that in gardens, only the ground is generally prepared by ploughing and harrowing, instead of digging and raking, and the proper time for sowing is March.

The ground should be naturally light, loose, of tolerable depth, and in good heart, as observed in the garden culture, and such as has been in tillage before; and if it has been dunged the preceding year, it will be a particular advantage; otherwise if the land is poor, some thoroughly rotten lightish dung may be spread over the surface, and ploughed in. The ground should be ploughed fifteen or eighteen inches deep, if the depth of good staple will admit, which is effected by double ploughing, i. e. ploughing twice in the same furrow; and two different ploughings at least are necessary, but if three, it will be much the better, that is, the first should be in the beginning of winter, turning it up in high ridges; the second is proper in January or beginning of February, across ways the first; and the third and final ploughing should be in March, and should then be well harrowed to break the clods, and smooth the surface for the reception of the seed: this is to be sown in the broadcast way, allowing a pound and half to an acre, mixing some sand or dry mould with the seeds, to enable you to scatter them more regularly, as in the garden culture. As soon as they are sown, harrow them in with a light harrow, and afterwards, when the surface is dry, roll the ground with a wooden horse roller to smooth the surface, whereby the seed will be more effectually covered, and the plants will rise more evenly.

When the Carrots are come up about three inches high, they must be hoed in dry weather, to thin them and destroy weeds; having a proper hoe about three to four or five inches wide, cut out the plants to eight or ten inches distance, stirring all the ground, and cut up all weeds; and in three or four weeks after, if weeds make their appearance, run over them again with the hoe, and they will require no further culture.

They will be grown to a large size in August and September, and be then fit for use; but if they are designed chiefly for winter eating, they should stand till November, then dug up, and laid in sand, to preserve them, as directed for the garden crops.

Saving the Seed.

To save Carrot-seed, you may either leave some of the main crop in the ground in autumn, at a foot distance, for that purpose; or, in spring, plant out a quantity of the finest, or of those which were taken up in autumn, and preserved all winter in sand.

But those which have been taken up and preserved in sand are preferable, especially for one thing; the roots being out of the ground, you can readily see and judge of their goodness, so as to select only some of the handsomest for planting, making choice of such whose tops are not cut too close to spoil the shoot for the flower-stalk; they should be planted in February, in rows two feet distance, and one foot apart in the lines, planting them perpendicularly and wholly into the ground about half an inch over their crown; they will readily take root, and shoot up flower-stalks, and require no other culture than hoeing occasionally to destroy weeds.

They will shoot up into stalk in April and May, be in full flower in June, and ripen seed in August, which should then be cut in dry weather, and spread in the sun and air a few days till thoroughly dry; then thresh it out, and put it up in bags.

This seed will sometimes retain its growing property two or three years; however, never depend on any but one year old seed for any principal crop; nor should the seedsmen serve their customers with any that is older, as I am sure it would prove a great disappointment.

DECIDUOUS Trees and Plants.—Such as defoliate or shed their leaves at the approach of winter.

This is a very comprehensive tribe, applicable to numerous sorts of trees, shrubs, and herbaceous plants, comprising many different genera, species and varieties, all of the Deciduous kind; producing their leaves in spring, which, finishing their growth in summer, decay

they fall off the same year in autumn or beginning of winter; and the respective trees and shrubs, &c. remain naked or leafless all that season, from October or beginning of November until April or May following.

Of this Deciduous tribe are most of our valuable forest trees, all the different sorts of fruit trees, and many of the ornamental tree kinds, as likewise the greater part of our most beautiful flowering shrubs, which adorn our shrubberies, &c. as also a very considerable number of herbaceous plants; though the term Deciduous is applicable more generally to trees and shrubs, than to the herbaceous tribe, as these latter, in most sorts, perish wholly down to the root every year in autumn, stem, leaves, and all; and in the trees and shrubs, the stem and branches being durable, they only defoliate or cast their leaves in autumn or winter, as before observed.

As therefore the appellation Deciduous, as well as that of Evergreen, is more generally understood to apply principally to trees and shrubs, it shall be observed accordingly in our present design, and include the tree and shrub kind only, and which consists principally in giving a general display, under one continued arrangement, of the names of all those as belong to the Deciduous tribe:—previously observing that as the Deciduous trees and shrubs are comprised in many different genera and species, &c. cultivated on various occasions in useful and ornamental gardening and plantations, they, in their general descriptions of growth, particular uses, and culture in the several garden departments, being all fully explained under the respective heads of the different genera, according as they alphabetically occur under their respective general botanic names in the course of the present work; but as hereby the numerous genera and species being dispersed in different parts of the book, agreeably to that order of arrangement, it was judged usefully expedient, under this head, Deciduous, to give the above-mentioned continued arrangement, comprising the general names of the whole Deciduous tribe together in one point of view, briefly showing at once, as it were, the names of all the different genera and principal species, &c. as come under that denomination; intending thereby to form a casual assistant to the memory, in occasionally making any collection less or more of these kinds of trees, &c. referring from this arrangement to the different genera under their respective heads aforesaid, for the particulars: as in the following arrangement is given not only the common or most general names, but also the generic botanical name of each ge-

nus is annexed, to which can readily recur as may be required on the above occasion.

And it may be further observed, that under this head, Deciduous, comprehending numerous genera and species of trees and shrubs, they are mostly all of hardy growth, such as will grow freely in the natural open ground and full air at all seasons of the year, and in any common soil and situation.

So that, under this arrangement, shall include only the Deciduous trees and shrubs, which are distinguished from the evergreens, by casting their leaves in autumn, remaining leafless all winter; the evergreens retaining their foliage in constant verdure, and as they are often employed on several occasions different from the Deciduous kinds, they are arranged separately in similar order under the head EVERGREENS;—and under each of which arrangements are given some general observations relating to their utility, &c. in gardening and planting.

As in the Deciduous tribe is comprehended all the sorts of fruit-trees, shall, in this arrangement, mention the names of the genera and some principal species, referring to the article *Fruit-trees* for a full display of the different species and varieties. See FRUIT-TREES.

Likewise, as the Deciduous tribe comprise many principal forest-trees, or such as are cultivated for timber and other oeconomic purposes in various trades, it is also proper to observe, that, as forest-trees consist both of Deciduous and evergreen kinds, the whole is given in a general arrangement, under a separate head, *Forest-trees*; but, as they are also occasionally introduced in ornamental or other general plantations, shall, under this head, give also the names of the general and principal species of those belonging to the Deciduous tribe. See also FOREST-TREES.

Shall now, after the foregoing observations, proceed to arrange the names of the genera and principal species, &c. of the Deciduous tree and shrub kinds, under the general head, in one point of view, by their most common or general known names, whether English or Latin, adding also the botanic name of the respective genera, in the following order.

Able tree—(*Populus*).

Acacia, False—(*Robinia*)—common false acacia—rose-flowered, or scarlet—carragana, or dwarf—four-leaved dwarf—shrubby yellow-barked.

Acacia, Three-thorned—(*Gleditsia*)—common three-thorned—Eastern thornless—monospermous, or single-seeded.

Agnus Castus, or Chaste tree—(*Vitex*)—narrow-leaved—broad-leaved,

Alder tree—(*Betula*)—round-leaved—long-leaved—hoary-leaved—cut-leaved—dwarf mountain alder.

Alder, Berry-bearing—(*Rhamnus*).

All-spice, American—(*Calycanthus*).

Almond tree—(*Amygdalus*)—common bitter-kernelled—sweet-kernelled—Jordan sweet—white-flowered—Eastern silvery-leaved—dwarf, single and double-blossomed—common almond.

Althæa frutex—(*Hibiscus*)—purple-flowered—red-flowered—white-flowered—pheasant-eyed—striped-flowered—striped-leaved.

Amorpha, Bastard Indigo—(*Amorpha*).

Andromeda, or Marth Cistus—(*Andromeda*)—see the genus *Andromeda*.

Angelica tree, Thorny—(*Aralia*).

Annona, American Papaw tree, or Custard Apple—(*Annona*)—tri-lobed-fruited—smooth-fruited.

Apple tree—(*Pyrus*)—common cultivated, many varieties—transparent-apple—fig-apple—two-year-apple—common crab—Siberian crab—sweet-scented Virginia crab—American cherry-fruited crab.

Apricot tree—(*Prunus*)—common, many varieties of the fruit—bloached-leaved.

Arbor Judæ, or Judas tree—(*Cercis*).

Ash tree—(*Fraxinus*)—common ash—flowering ash—manna ash—American ash—Carolinian ash—paniculated—entire-leaved.

Ash, Mountain—(*Sorbus*).

Ash, Poison—(*Rhus*).

Aspen tree—(*Populus*).

Atriplex Halimus, or Sea-Purflane tree—(*Atriplex*).

Azalea, American honeysuckle—(*Azalea*)—viscous-flowered—red-flowered—white-flowered—scarlet.

Azarole—(*Cratægus*)—several sorts; see the genus *Cratægus*.

Bay tree—(*Laurus*)—deciduous bay—sassafras tree—Benjamin tree.

Bead tree—(*Melia*)—common deciduous melia.

Beech tree—(*Fagus*)—common green-leaved—yellow-striped-leaved—white-striped-leaved—dark-purple-leaved.

Benjamin tree—(*Laurus*).

Berberry tree—(*Berberis*)—common red-fruited—stoneless red-fruited—white-fruited—Canadian.

Bignonia, Trumpet-flower—(*Bignonia*)—radicant climbing, or common trumpet-flower—catalpa, or tree bignonia.

Birch tree—(*Betula*)—common white—black Virginia—dwarf Alpine.

Birth-wort—(*Aristolochia*)—tree birth-wort [is rather tenderish.]

Black-thorn—(*Prunus*).

Bladder Nut—(*Staphylea*)—three-leaved—five-leaved.

Bladder Sena—(*Colutea*)—tree, or common—Pocock's early—Oriental red-flowered—shrubby scarlet.

Bonduc, or Nickar tree—(*Guilandina*).

Box-thorn—(*Lycium*).

Bramble—(*Rubus*)—common wild-bramble—double-blossomed—thornless bramble—striped-leaved—white-fruited—dwarf bramble.

Briar, Sweet—(*Rosa*)—common sweet-scented—double-flowered—double blush-flowered—double scarlet—yellow-flowered.

Broom—(*Spartium*)—rushy-twiggied, or Spanish—double-flowered Spanish—white Spanish—starry Italian—besom, or common wild broom.

Broom, Dwarf, or Jointed—(*Genista*).

Buck-thorn tree—(*Rhamnus*)—common cathartic—dwarf shrubby.

Buck-thorn, Sea—(*Hippophae*)—European willow-leaved—American oval-leaved.

Bullace tree—(*Prunus*).

Button tree—(*Cephalanthus*).

Candle-berry Myrtle—(*Myrica*)—wax-berried, or common—narrow-leaved—broad-leaved—gale, or Dutch myrtle.

Cassio-berry bush—(*Viburnum*).

Catalpa—(see *Bignonia*).

Ceanothus, or New Jersey Tea tree—(*Ceanothus*).

Celastrus Staff tree—(*Celastrus*)—climbing celastrus.

Cephalanthus, or Button tree—(*Cephalanthus*).

Chaste tree, see Agnus Castus—(*Vitex*).

Cherry tree—(*Prunus*)—cherry, many varieties—double-blossomed cherry—wild-black—wild-red—padus, or bird-cherry—Virginia bird-cherry—Canada bird-cherry—mahaleb, or perfumed cherry.

Cherry, Cornelian—(*Cornus*)—male, or common red-fruited—several other species; see *Cornel tree*.

Chestnut tree—(*Fagus*)—common Spanish—long shining-leaved—striped-leaved—chinquapin, or dwarf American—American large-fruited.

Chestnut, Horse—(*Æsculus*)—common white-flowering—striped-leaved—scarlet-flowered—yellow-flowered.

Chionanthus, or Fringe tree—(*Chionanthus*).

Christ's Thorn—(*Rhamnus*).

Cinquefoil Shrub—(*Potentilla*).

Clematis, Climber, or Virgin's Bower—(*Clematis*).

Clethra—(*Clethra*)—Alder-leaved.

Cob-nut—(*Corylus*).

Cockspur Thorn—(*Cratægus*).

Colutea; see Bladder Sena.

Colutea,

Colutea, Jointed-podded—(*Coronilla*).
 Coriaria, Tanner's, or Myrtle-leaved Sumach—(*Coriaria*).

Cornus, Cornel tree, or Cornelian Cherry—(*Cornus*)—male cornus, or common cornelian cherry—bloody-berry, or common dogwood—great-flowered Virginian—filky-leaved American—white-berried Pennsylvanian.

Coronilla, or Jointed-podded colutea—(*Coronilla*)—emerus, or scorpion-fena.

Crab tree—(*Pyrus*)—common apple crab—Siberian crab—American crab—sweet-scented Virginian—pear crab.

Cranberry—(*Vaccinium*)—several species.

Creeping, Virginia—(*Hedera*).

Currant tree—(*Ribes*)—red-berried—white-berried—black currant—Pennsylvanian black—striped-leaved currant.

Cypress tree—(*Cupressus*)—deciduous cypresses.

Cytisus, Base-trefoil tree—(*Cytisus*)—laburnum, or tree cytisus, (see *Laburnum*)—some other species,—see the genus *Cytisus*.

Damson tree—(*Prunus*)—common damson—double-flowered.

Diervilla, or Dwarf Yellow Honeyfuckle—(*Lonicera*).

Diospyros, or Date Plum—(*Diospyros*)—European—Virginian.

Dog's-bane, Climbing—(*Periploca*).

Dog-wood—(*Cornus*)—great-flowered—red-berried—blue-berried—white-berried—bloody-berry, or common dog-wood. See the genus *Cornus*.

Elder tree—(*Sambucus*)—common black-berried—white-berried—parsley-leaved—silver-striped-leaved—silver-dusted—gold-striped—racemous, scarlet-flowered—Canadian.

Elm tree—(*Ulmus*)—common doubly-sawed-leaved—small-leaved—broad-leaved—striped-leaved—narrow-leaved Cornish Dutch rough-barked—wych or Scotch elm—American singly-sawed-leaved—dwarf elm. See the genus *Ulmus*.

Elæagnus, or Wild Olive—(*Elæagnus*)—narrow-leaved—broad-leaved—Empetrum, or black-berried heath—(*Empetrum*).

Euonymus, or Spindle tree—(*Euonymus*)—European Deciduous, comprising—the narrow-leaved—broad-leaved—red-berried—white-berried—striped-leaved.

False Acacia. See *Acacia*.

False Plane tree—(*Acer*).

Fig tree—(*Ficus*)—common fig tree,—several varieties.

Filbert tree—(*Corylus*)—red-kernelled—white-kernelled.

Fothergilla—(*Fothergilla*).

Frangula, or berry-bearing alder—(*Rhamnus*).

Fringe-tree—(*Chionanthus*).

Gale, Sweet Willow, or Dutch Myrtle—(*Myrica*).

Genista, dwarf, or jointed broom—(*Genista*)—arrow-shaped—upright of Montpellier—dyers' broom—trident-leaved—dwarf English, or petty whin.

Ginkgo, or Maiden-hair tree—(*Ginkgo*).

Glass-wort, Shrubby—(*Salicaria*).

Glastonbury Thorn—(*Cratægus*).

Goat's Thorn—(*Astragalus*).

Gooseberry tree—(*Ribes*)—several species—many varieties of the fruit, as—red-berried—green-berried—yellow-berried—white-berried—prickly-berried—currant-leaved. See *Ribes Grossularia*.

Groundsel tree—(*Baccharis*).

Guelder Rose—(*Viburnum*)—common single—double-flowered, or Snow-ball tree—striped-leaved.

Guelder Rose, Virginia—(*Spiræa*).

Haleia, or Snow-drop tree—(*Haleia*)—quadrangular-fruited—biangular-fruited.

Hamamelis, or Virginia wych-hazel—(*Hamamelis*).

Hawthorn—(*Cratægus*)—common hawthorn, or white thorn—several varieties: see the genus *Cratægus*.

Hazel-nut tree—(*Corylus*)—common, many varieties—filbert red and white-kernelled—American cuckold-nut—dwarf Byzantine.

Heath—(*Erica*)—some species, though scarcely deciduous.

Hicory tree, or American walnut—(*Juglans*)—white hicory—black—shag-barked—smooth-barked—dwarf.

Honeyfuckle—(*Lonicera*)—common white—large white—early white—red Dutch—long-blowing red Dutch—Italian early white—Italian early red—late red—fly-honeyfuckle—diervilla, or yellow—Tartarian—with several other species and varieties. See the genus *Lonicera*.

Honeyfuckle, American, Upright—(*Azalea*)—white-flowered—red-flowered—and some other varieties.

Hornbeam tree—(*Carpinus*)—common hornbeam—variegated-leaved—cut-leaved—Eastern—hop hornbeam—Virginia flowering.

Horse-chestnut tree—(*Æsculus*)—see Chestnut.

Hydrangea—(*Hydrangea*)—tree hydrangea.

Hypericum, or St. John's Wort—(*Hypericum*)—common stinking—inodorous, or scentless—Canary—dwarf American—tutian, or park leaves—large-flowered.

Hypericum Prutex—(*Spiræa*)—narrow-leaved—broad-leaved.

Jasmine—(*Jasminum*)—common officinal

white — gold-striped-leaved — silver-striped-leaved — shrubby yellow — dwarf yellow.
 Jasmine, Persian — (*Syringa*).
 Jesuits' Bark, False — (*Iva*) — common shrubby.
 Indigo, Bastard — (*Amorpha*) — thorny of Canada.
 Ironwood — (*Sideroxylum*).
 Itca — (*Itea*) — Virginia itca.
 Judas tree — (*Cercis*).
 Ivy — (*Hedera*) — five-leaved, or Virginia creeper.
 Kidney-bean tree — (*Glycine*) — Carolinian — Virginian.
 Laburnum — (*Cytisus*) — common small-leaved — broad-leaved — long-spiked.
 Lac tree — (*Rhus*).
 Larch tree — (*Pinus*) — common upright red — white — black American — horizontal-branching — dwarf.
 Laurustinus — (*Viburnum*) — deciduous.
 Leatherwood — (*Dirca*) — marsh Virginian.
 Lilac — (*Syringa*) — blue-spiked — white-spiked — purple-spiked — Persian lilac — purple-flowered Persian — white-flowered Persian — blue-flowered Persian — cut-leaved Persian.
 Lime tree — (*Tilia*) — common green-twigged — red-twigged — Virginia smooth-leaved — Carolina woolly-leaved.
 Liquidambar, sweet gum-tree — (*Liquidambar*) — styrax - flowing, maple-leaved — spleen-wort leaved.
 Lombardy poplar — (*Populus*).
 Magnolia, or laurel-leaved tulip-tree — (*Magnolia*) — glaucous - leaved — small - glaucous with double flowers — acuminate-leaved — umbrella magnolia.
 Maple-tree — (*Acer*) — common smaller — greater, or sycamore-tree — plane-tree-leaved — sugar-maple — Pennsylvanian — red, or scarlet flowering — Tartarian — ash-leaved — Montpelier — maple — Cretan maple — Italian.
 Mealy tree, pliant — (*Viburnum*).
 Medlar tree — (*Mespilus*) — German, or common — arbutus-leaved — amelanchier, or shrubby medlar — dwarf medlar — cotoneaster, or dwarf quince — Canada snowy mespilus — woolly-leaved.
 Menespermum, or moon-seed (*Menespermum*) — Canada round-leaved — Virginia lobate-leaved.
 Mezercon — (*Daphne*) — early red — purple — white.
 Mimosa, or sensitive plant — (*Mimosa*) — tree mimosa — pinnatifid-leaved acacia.
 Mulberry-tree — (*Morus*) — common black-berried — red-berried — white-berried — paper mulberry-tree of Japan.
 Myrica, (see candle-berry myrtle).

Nectarine tree — (*Amygdalus*).
 Nettle tree (*Celtis*) — South European — Occidental American — Oriental, or Eastern.
 Nickar tree, (see Bonduc).
 Nightshade, woody — (*Solanum*) — common green-leaved — variegated-leaved.
 Nyssa, or tupelo tree — (*Nyssa*).
 Oak tree — (*Quercus*) — common English — American chestnut-leaved — willow-leaved — white Virginia oak — black Virginian — red Virginian — cut leaved Italian — prickly cupped Spanish — Turkey oak — with several varieties of different species — See the genus *Quercus*.
 Oak, Poison — (*Rhus*).
 Olive, wild (See *Elæagnus*).
 Ononis, or rest-harrow (*Ononis*) — shrubby purple.
 Osier tree — (*Salix*).
 Paliurus, or Christ's Thorn — (*Rhamnus*).
 Papaw tree. North American — (*Annona*).
 Passion-flower — (*Passiflora*) — blue-rayed or common.
 Peach tree — (*Amygdalus*) — common, many varieties — double flowered — dwarf peach. See the genus *Amygdalus*.
 Pear tree — (*Pyrus*) — common pear, many varieties — double blossomed — twice-flowering — striped-leaved.
 Periploca, or climbing dog's bane — (*Periploca*).
 Persimon or Pishamin plum — (*Diospyros*).
 Pistachia tree — (*Pistacia*) — true pistachia tree — turpentine tree.
 Plane tree — (*Platanus*) — Oriental plane — Occidental American — Spanish, or middle plane.
 Plane tree, false — (*Acer Pseudoplatanus*).
 Pliant mealy tree — (*Viburnum*).
 Plum tree — (*Prunus*) — domestic, or common cultivated, many varieties — double-flowered — damson tree — bullace tree.
 Pomegranate tree (*Punica*) — granulous-fruited common — large double-flowered — striped-leaved.
 Poplar tree — (*Populus*) — Abele tree, or common white — cut-leaved white — black poplar — aspen-tree, or tremulous poplar — Carolina poplar — Canada poplar — various leaved — tacamahacca, or balsam poplar — Athenian poplar — Lombardy poplar, the most swift grower of the populus tribe, and of almost any other tree of our plantations.
 Prinos, or winter-berry — (*Prinos*) — verticillate Virginian.
 Privet (*Ligustrum*) — common privet — bloach-leaved — Carolina broad-leaved.
 Ptelea, or shrubby trefoil — (*Ptelea*) — trifoliolate-leaved.
 Purflane tree, Sea — (*Atriplex*).

Quick, or haw-thorn, or white-thorn—(*Cratægus*).

Quince tree—(*Pyrus*)—common, large, pyramidal fruited—apple-shaped—pear-shaped—broad-leaved Portugal.

Quince, bastard—(*Mespilus*).

Raspberry—(*Rubus*)—common red berried—white berried—twice-bearing—cane, or smooth stalked—greater German—large yellow-fruited—odorous, or sweet-flowering, &c.

Rest-harrow—(*Ononis*).

Roane tree—(*Sorbus*).

Robinia, or false acacia—(*Robinia*)—See *Acacia*.

Rose tree—(*Rosa*)—white rose—double white—maiden's-blush white—red rose, officinal—double-red—Provence red rose—double Provence—blush Provence—cabbage Provence—moss Provence—red Dutch—hundred-leaved Dutch cabbage rose—marble rose—monthly rose—York and Lancaster rose—damask red rose—damask white—Austrian red and yellow—yellow Austrian—rosa-mundi, or variegated—Scotch rose, red, white, striped—yellow rose, single, double—velvet-rose—cinnamon rose—thornless, or virgin rose—musk rose—Pennsylvanian rose—burnet-leaved rose—rose de Meaux—apple bearing—eglantine rose, or sweet briar—canine, or dog rose, red, white; with many other sorts of roses both in species and varieties.—See the genus *Rosa*.

Saint John's wort—(*Hypericum*).

Saint Peter's Wort, Shrubby—(*Lonicera*).

Sallow tree—(*Salix*).

Salsola, shrubby glass-wort—(*Salsola*).

Sassafras tree—(*Laurus*).

Scorpion-fenna—(*Coronilla*).

Service tree, or Sorb—(*Sorbus*)—common domestic or cultivated—with berry fruit—apple-shaped—pear-shaped—bird's service, or mountain ash.

Service tree, Wild—(*Cratægus*)—common, or maple-leaved—azarole service—Virginia azarole—scarlet Virginia service—cockspur-thorn—downy-leaved Virginian—green-leaved—common hawthorn, white-thorn, or quick—Glastonbury thorn. See the genus *Cratægus*.

Sloe tree—(*Prunus*).

Smilax, or Rough Bindweed—(*Smilax*)—rough, or common smilax—oval-leaved—round-leaved.

Snow-ball tree—(*Viburnum*).

Snow-drop tree—(*Chionanthus* and *Halesia*).

Southern-wood—(*Artemisia*)—common green—white-leaved—dwarf yellow.

Spiræa, or Spiræa Frutex—(*Spiræa*)—willow-leaved, common red-spiked—downy-

leaved scarlet—white-flowered—Guelder rose-leaved—hypericum-frutex—crenated leaved—forbus-leaved.

Stewartia—(*Stewartia*).

Storax tree—(*Liquidambar*).

Sumach—(*Rhus*)—tanner's sumach—stag's horn sumach—Venice sumach—lentiscus-leaved—smooth sumach—smooth scarlet—smooth red—varnish tree—American toxicodendron, or poison oak—radicant toxicodendron.

Sweet Briar—(*Rosa*)—see Briar and Rose tree; also the genus *Rosa* for the different varieties.

Sycamore tree—(*Acer*)—common sycamore—striped-leaved.

Syringa, or Mock Orange—(*Philadelphus*)—coronate common—double-flowered—striped-leaved—inodorous, or scentless.

Tacamahacca, or Balsam Poplar—(*Populus*).

Tamarisk tree—(*Tamarix*)—French red-barked—German yellow-barked.

Thorn tree, Haw, or White Thorn—(*Cratægus*)—common hawthorn—Glastonbury thorn—cockspur thorn, &c. See the genus *Cratægus*.

Tooth-ach tree—(*Zanthoxylum*).

Toxicodendron, or Poison Oak—(*Rhus*)—See *Sumach*.

Tragacanth, or Goat's Thorn—(*Asparagus*).

Traveller's Joy—(*Clematis*).

Tulip tree—(*Liriodendron*).

Tupelo tree—(*Nyssa*).

Vaccinium, or Whortle-berry—(*Vaccinium*)—comprising the whortle-berry, bilberry, cranberry, &c. See the genus *Vaccinium*.

Viburnum, or Wayfaring tree, &c.—(*Viburnum*)—common, or pliant mealy tree—plum-leaved viburnum—maple-leaved—dentated-leaved—laurustinus-leaved—cassio-berry bush—Guelder rose.

Vine, or Grape tree—(*Vitis*)—common cultivated, many varieties—fox-grape—cut-leaved—tree winged-leaved.

Virgin's Bower—(*Clematis*)—common blue-flowered—purple, red, and double-flowered—traveller's joy—curled-flowered clematis—Virginia ternate-leaved—oriental yellow—coriaceous-flowered—flammula, or sweet-scented. See the genus *Clematis*.

Walnut tree—(*Juglans*)—common cultivated, several varieties—hiccory, or American walnut, comprising the black hiccory, white, hag-barked, smooth-barked.

Wayfaring tree, see *Viburnum*.

Whortle-berry, see *Vaccinium*.

Willow

Willow tree—(*Salix*)—common white—shining-leaved—white-barked—red-willow—purple willow—Norfolk purple—pendulous, or weeping willow—yellow-barked willow—osier willow—fallow tree, or ovate-rough-leaved willow—with several other species. See the genus *Salix*.

Zanthoxylum, or tooth-ach tree—(*Zanthoxylum*)—broad-leaved—narrow-leaved.

The foregoing register of the Deciduous trees and shrubs comprehends all those of hardy growth, that will grow in the full ground at all seasons in any common soil and situation; and comprises all those of this tribe as are employed in decorating the various ornamental plantations in pleasure-grounds, shrubberies, parks, and other districts; as also the different sorts of Deciduous forest trees for timber and coppice plantations, and all the species of fruit-trees. But as the forest and fruit trees are arranged each under a separate head, in the articles *Forest* and *Fruit Trees*, their different species and varieties are more fully explained; so that under the present arrangement, they are all proper, either in general or select collections, to use in forming any pleasurable plantations, or as may be required, according to the nature of growth or peculiar merit of the different sorts of trees and shrubs in the respective genera, as they occur in the general course of the book.

They are propagated or raised by several different ways, and mostly all in the natural ground; many of them by seed, others by layers, cuttings, suckers, some by grafting and budding; mostly all performed in the spring, in February, March, and April, or many occasionally in autumn, in September, October, and November, though grafting is always performed in the spring, and budding in summer, July and August: the whole being fully explained for all the different sorts under their proper heads in the process of the general work; to which we refer for the proper directions; and likewise to the article *Nursery*, in which are many essential observations relative to the raising and managing young trees and shrubs in general to proper growths for final transplantation. See *NURSERY*.

All the sorts here arranged are cultivated in all the principal public nursery grounds, for the supply of those who may have occasion to make collections, less or more, for their several or particular plantations.

As they are adapted for various sorts of hardy plantations, in gardens, pleasure-grounds, shrubberies, &c. proper collections may be made of the sorts required, either for general or any particular occasion, by recurring to

the respective genera for the desired information of their different degrees of growth, peculiar habit, and specific distinction, and respective merit and utility for different purposes; a great number being large and lofty trees, as in the ashes, maples, beeches, elms, oaks, planes, poplars, &c. valuable both as first-rate timber trees, and for any large plantations; others are of moderate growth to assemble in any general plantation departments; and a very considerable number come under the flowering shrub denomination; together with all the different species of fruit trees, both to plant as such, and some occasionally to assemble in ornamental planting.

The season for planting or transplanting all the Deciduous trees and shrubs, is autumn and spring; and occasionally in winter, in open mild weather.

The autumn planting of Deciduous trees, &c. commences about October and November, when the trees, &c. have terminated their year's growth, announced by the decay and falling of the leaves, when most sorts of the Deciduous tribe may be successfully removed or transplanted, which may be continued as required, from about the middle or latter end of October, till December or January, if mild open weather continues, but if appearance of severe frost, should decline all planting business, or at least the removal of trees for that occasion; and any as happen to be then out of the ground should be planted as soon as possible, before the frost approaches in a very rigorous degree; and in some of the less hardy or common sorts lately planted, should be secured from the rigours of frost by laying mulch on the ground over the roots.

Spring planting in all the Deciduous kinds may commence in February, if settled temperate weather, and continued as required all that month and March; or occasionally till the beginning or middle of April; when as all the trees and shrubs of this tribe will be beginning to bud forth considerably for the renewal of their leaves, after which it is too late to make any principal transplantation or removal for planting; so that it is generally advisable to finish that business as much as possible by the latter end of March, or early part of April, before the trees begin to advance considerably in their spring shoots; and if wholly completed in February or March, it will be of beneficial advantage to the plants, as they will strike fresh root more effectually, and establish their rooting more firmly before the drought of spring and summer commences.

In removing these trees for planting, should be careful to take them up with a full spread of

of roots as entire as possible; and of which cut off any part broken or damaged in taking up: prune the ends of very long stragglers, and shorten any downright tap roots: and examining the head, prune any casual irregularity, clearing also away suckers from the bottom, and low shoots from the stem.

And in general planting should open a circular aperture for the reception of each tree, one to two or three feet or more diameter, according to the expansion of the root, and of proportionate depth to admit the whole root freely in its full spread, and so deep as the upper roots may be three or four inches at least under the surface: so trimming in the earth regularly about the roots, shake the tree or shrub by the stem gently up and down, that the earth may fall in more effectually close about all the roots and radical fibres, filling up the hole fully a proper depth over the top roots; then tread it down moderately close, first round next the circumference, continuing inward to the stem; and then finish the surface evenly, or a little hollow, the better to contain the moisture of rain or watering, especially in late spring or early autumn planting.

In the early autumn and late spring planting, if dry light ground, it will be good advantage to give each tree, &c. a moderate good watering to the roots as soon as planted; which, in late spring planting particularly, should not be omitted; and the watering occasionally repeated in very dry weather.

DELPHINIUM, (*Dolphin-flower*), commonly called Larkspur.

The plants are hardy, herbaceous, flowery annuals and perennials, of upright growth, from about a foot and a half to four feet high, garnished with finely-divided leaves, and terminated by long spikes of pentapetalous flowers.

Class and order, *Polyandria Trigynia*.

Characters.] **CALYX**, none. **COROLLA**, five irregular petals, the upper one extended at the base into a tubular, obtuse tail, and a bifid nectarium in the centre. **STAMINA**, many filaments, and small erect antheræ. **PISTILLUM**, three oval germina, three styles, and reflexed stigmas. **PERICARPIUM**, three united unilocular capsules, and many angular seeds.

There are about four species of *Delphinium* common to the English gardens, all of them considered as flowery plants, two of which are annual, and the rest perennial, viz.

1. **DELPHINIUM Ajacis**.

(*Ajacis*)—*Upright, or Unbranched Annual Larkspur.*] *Delphinium*, with an upright, simple, unbranching stalk, two or three feet

high, garnished with finely-divided leaves, and terminated by an erect long spike of flowers, having monophyllous nectariums, and of different colours in the varieties.

Varieties are,] Upright Annual Larkspur, with single and double blue flowers—Single and double purple flowers—Single and double red flowers—Single and double white flowers—Single and double silver-coloured flowers—Single and double violet-coloured flowers—Single and double ash-coloured flowers—Single and double striped flowers—Large rocket Larkspurs—Dwarf rocket Larkspurs very beautiful.

All these varieties of *Delphinium Ajacis*, or Unbranched Larkspur, rise with a simple stem, scarce emitting any side branches; and each stalk is terminated by a very long, erect, flowery spike, composed of numerous closely-placed flowers, which exhibit a very ornamental appearance in June, July, and August, succeeded by plenty of ripe seed in September.

2. **DELPHINIUM Consolida**.

Branching Annual Larkspur.] *Delphinium*, with an upright, sub-divided, branchy stalk three feet high, long, finely-divided leaves, and all the branches terminated by long ascending spikes of flowers, having monophyllous nectariums, and of different colours in the varieties.

Varieties.] Nearly the same in colour as the Unbranched Larkspur, and of which are singles and doubles.

All the varieties of this species send out many branches horizontally, which turn upward toward the extremity, the flowers large, but rather thinly placed in the spikes; they all, however, form a very ornamental variety in the borders, &c. in July and August, succeeded by plenty of seeds in autumn.

3. **DELPHINIUM elatum**.

Tall Perennial Bee Larkspur.] *Delphinium*, with several upright stalks four or five feet high, adorned with hairy leaves, cut into many broad, expanded segments, and all the stalks terminated by long, erect spikes of blue flowers, having diphyllous nectariums, with bifid lips, bearded at the top.

4. **DELPHINIUM grandiflorum**.

Grandiflorous, Perennial, Bee Larkspur.] *Delphinium*, with upright, branchy stalks a foot and a half high, smooth leaves, composed of many narrow segments, ending in several points, and towards the upper part of the stalks large azure-coloured flowers singly, having diphyllous nectariums, with entire lips, appearing in July, succeeded by seed in autumn.

Of these four species, the two first and varieties are wholly annual, but the third and fourth

fourth are perennial in root, and annual in stalk, which rise in spring, and decay in autumn.

The names Larkspur and Bee Larkspur are derived from the resemblance of the tail of the corolla to the spur of a lark's foot; and from the nectarium of the perennial sorts to a bee.

The flowers of all the sorts are moderately large, numerous, and mostly collected into erect spikes, and are very conspicuous and ornamental.

All the sorts are very ornamental furniture for the borders and other compartments of the pleasure-ground, and are so hardy that they prosper in any common soil and exposure, and all the sorts are raised abundantly from seed in the full ground, as directed below.

Propagation and Culture.

The two annual sorts and varieties are of the tribe of hardy annuals, raised from seed in the open ground, sown annually in the spring, or occasionally in autumn, but most generally the former; all commonly sown in small patches in the borders, &c. in assemblage with other hardy annuals in the places where it is designed to have the plants flower, not transplanted, as they do not succeed so well by transplantation.

The most general season for sowing is the spring, in February, March, or not later than the beginning or middle of April; and, as above observed, may occasionally sow some in the autumn about August or September, &c. as the plants of that sowing sometimes rise stronger in the spring, and flower earlier than the spring-sown plants; however, as the spring sowings also come up freely and flower in good perfection, it will generally be more eligible, as the most convenient and regular method, to sow the principal supply in that season, or, if some are also sown in the autumn, the plants of which coming earlier into flower, will be succeeded by those of the spring sowing; and thereby a longer continuation of the flowers will be obtained: or, as sometimes scattered seeds, disseminated from old seeding plants in autumn, are productive of many young plants rising naturally in the spring in the borders, may retain such of them as are the most regularly placed, to remain for flowering; the others, if removed young with a little earth about the roots, may be planted in another place, and continued; they will take root and run up to flower in a middling degree, in successional order.

It, however, is always the most regular method to sow the general supply in the spring, as before observed.

The method of sowing being principally in

little patches, as before intimated, towards the middle part of the borders in a varied order, digging or loosening the earth for each patch, with a garden trowel, &c. forming the patches about five or six inches diameter, sowing in each ten or twelve seeds about half an inch deep (see ANNUAL PLANTS), and when the plants are come up an inch or two high, if any appear too thick, thin them to about six or eight strongest in each patch, of the upright kinds; and the branching sorts to three or four in each place, which is principally all the culture they require; they will run up quickly for flowering in June and July, &c. in a beautiful variety.

But when intended to have a grand show of them in beds by themselves, they are commonly sown in drills, forming the drills lengthways the beds, a foot asunder, and an inch deep, so scatter the seeds thinly along the drills, and rake the earth over them evenly; but the unbranched kinds are the best adapted for this mode of culture.

Or they may be sown broad-cast on the surface of the bed, and raked in, and when the plants are an inch or two high, thin them by hand or hoe, to three or four inches distance, but the branched kinds to treble that distance.

Or sometimes the dwarf Larkspur is sown separate in beds in distinct patches, in rows along the bed, a foot asunder, and the patches the same distance in the row, disposed in the quincunx order; in which they make a pretty appearance.

In occasionally sowing Larkspurs in autumn, some may be disposed in patches, as already directed, placing a small stick as a mark to each patch; and may sometimes scatter some seeds promiscuously about the borders, and hoed or raked in; many plants will rise in the spring, when you may select the best and most regular placed to remain, and remove the others that stand disorderly.

To preserve the varieties of these two annual species from degeneration, all those of bad colours, and that are very single, should be pulled out as soon as they show bloom enough to discover their properties; for their farina would impregnate the fine sorts, and cause a degeneracy.

The perennial sorts.—These are also raised plentifully from seeds sown in autumn or spring, in a bed or border of common earth for transplantation. Sow them on the surface, and rake them in, and when the plants come up, hand-weed them occasionally, and thin them to three or four inches distance, to remain till October or November; then plant them

them out where they are to remain to flower: their roots will endure many years, increase in size, and the larger they are, the greater number of flower-stalks they produce, so as to exhibit a large show of bloom.

DENTARIA, Toothwort, or Tooth Violet (*Dentaria*).

This genus furnishes three hardy, herbaceous, flowery perennials, producing annual stalks twelve or eighteen inches high, adorned with many-lobed leaves, and spikes of quadripetalous cruciform flowers.

Class and order, *Tetradynamia Siliquosa*.

Characters.] CALYX, four oblong-oval, deciduous leaves. COROLLA, four obtuse, cruciform petals. STAMINA, four long and two shorter filaments, and erect, heart-shaped antheræ. PISTILLUM, an oblong germen, thick style, and blunt stigma. PERICARPIUM, a long, taper, bivalvular, bilocular pod, and many roundish seeds.

The species are,

1. DENTARIA *pentaphylla*.

Five-lobed Dentaria.] *Dentaria*, with upright strong stalks a foot and a half high, garnished with digitate, five-lobed leaves, and terminated by loose spikes of blush-coloured flowers.

2. DENTARIA *enneaphylla*.

Nine-lobed Dentaria.] *Dentaria*, with upright stalks a foot high, garnished with ternate trifoliate leaves, being composed of nine lobes by threes, and the stalks crowned by bunches of purplish flowers.

3. DENTARIA *bulbifera*.

Bulbiferous Seven-lobed Dentaria.] *Dentaria*, with slender stalks a foot high, the lower leaves pinnated and seven-lobed, the upper ones simple, and the stalks bearing bulbs at their sides, and the top crowned by clusters of purple flowers.

The flowers of all these three species are composed of four cruciform, obtuse petals, and are collected into spikes or clusters at top of the stalks, appearing in summer, and are succeeded by plenty of seed.

The plants are all of the flowery tribe, perennial, hardy, and delight most in shade; they are therefore proper furniture for the borders of shady walks, and such like compartments, though they will also succeed in any of the open borders.

They are propagated by seed, and by parting the roots.—Sow the seed in autumn soon after it is ripe, or early in spring, in a shady border of light earth; and when the plants are three inches high, may be planted where they are to remain, and they will flower the year following. By parting the roots, it may

be done in October or November, or early in spring.

The bulbs produced on the sides of the stalks of the *Dentaria bulbifera*, taken off and planted, readily become plants.

DIANTHUS, Clove Gilliflower, Carnation, Pink, Sweet William, &c.

This genus furnishes a grand collection of herbaceous, beautiful flowery perennials and biennials, of hardy growth, for the pleasure-ground, all of them fibrous-rooted, and the roots mostly crowned with leaves all the year, sending up flower-stalks annually from one to three feet high, adorned at top with very conspicuous, pentapetalous, solitary, and aggregate flowers.

Class and order, *Decandria Digynia*.

Characters.] CALYX is long, cylindrical, indented into five parts at top, scaly at the base, and persistent. COROLLA is, in its single state, pentapetalous, with long narrow claws the length of the calyx, but the limbs broad, plane, and their edges crenated. STAMINA, ten long filaments, and oval, oblong, compressed antheræ. PISTILLUM, an oval germen, two styles, and recurved, acuminate stigmas. PERICARPIUM, a cylindric, unilocular capsule, four-parted at top, and many compressed, roundish, angulated seeds.

There are many species of *Dianthus*, but not more than four that have any considerable merit as garden-flowers, each of which furnishing some beautiful varieties.

For distinction sake we shall treat of them under three different heads; first, the Gilliflower or Carnation kinds,—second, all the Pink kind,—and third, all the Sweet William tribe; all under the generic title of *Dianthus*.

First Head. The Gilliflower, or Carnation kinds.

There is but one species of Gilliflower, or Carnation, but which admits of a profusion of most elegant varieties, all very ornamental flowery plants, for the embellishment of the pleasure-garden, flowering beautifully in July and August, succeeded by abundance of seed in autumn.

The species is,

DIANTHUS *Caryophyllus*.

(*Caryophyllus*)—or *Clove Gilliflower, including all the varieties of Carnation.*] *Dianthus*, with many short, trailing shoots from the root, garnished with long, very narrow, evergreen leaves, and amidst them upright, slender flower-stalks, from one to three feet high, emitting many side shoots, all of which, and the main stalk, terminated by large, solitary flowers, having short, oval scales to the calyx, and crenated petals.

The varieties of this are very extensive, and unlimited in the diversity of the flowers.

Principal varieties are,

Common Clove Gilliflower—having a large, dark-red, sweet-scented flower, smelling fragrantly like cloves; hence derived the name, and of which there are—Single Clove Gilliflower—Double Clove Gilliflower.

Carnation, sometimes called Coronation (Coronarius)—having a reddish single and double flower—Variegated red and white single and double flower—Variegated red, purple, and white single and double flowers—Variegated red, scarlet, purple, and white single and double flower—Variegated red, or purple above, and white underneath, single and double flowers;—and innumerable other intermediate varieties.

But these varieties (Variegated Carnations) are by the florists divided into four principal classes, according to their different modes of variegation, viz.

Flake Carnations—having only two principal colours, disposed in broad flakes or stripes quite through the petals.

Bizarre Carnations—having three or four different colours, red, purple, scarlet, &c. in different shades, variously disposed in irregular spots and stripes.

Piquette Carnations—having always a white ground, pounced or finely spotted with red, scarlet, purple, or other colours.

Painted Lady Carnation—having the petals a bright red or purple above, and entirely white underneath.

Each of the above four principal classes, though tolerably permanent, admit separately of innumerable varieties, formed, both in respect to the lustre of the different colours, &c. as well as the different modes or dispositions of the stripes, spots, and other diversities, in being more or less striped with larger or smaller stripes, or with different colours in the same stripe, or all of one colour: the same is also observable in the spotted or pounced flowers, by the spots being either more frequent, or thinly scattered, or large, or small, and such like variegations; and by which the florists form new varieties, acquired by raising some every year from seed; for from the seed of the varieties of each respective class indefinite numbers of new ones are annually gained, varying in some particular circumstances as above, from any that have before appeared; so greatly do they vary from seed. But it must be remarked, that, out of a great number so obtained from seed, there may, probably, be but few that possess the requisite properties by which florists distinguish a fine Carnation. However, all good new varieties, of the above four principal classes, obtained

among professed florists, are generally dignified with the name of some great personage, or that of the person who first raised them, or that of the place where they were raised; so that, including the different parts of the kingdom, there may be many hundred different varieties, known in different places by different titles, as above, so that it will be impossible to enumerate them here; observing, however, that all of them belong principally to one or other of the above classes; and that being first of all obtained accidentally from seed, they are afterwards propagated, and continued only by layers, &c. for so the seed of any particular sort, it is a hundred to one if any prove exactly like the parent; but by layers, every one retains all the properties of the mother plant. See their *Propagation*.

The flowers of this species and respective varieties are, in their characteristic or single state, composed of five petals; but in the double flowers the petals are numerous, and continued quite to the centre; the doubles are also larger, and considerably more beautiful; and these only should be principally cultivated, which being all first obtained accidentally from seed, they are continued and increased at pleasure by layers.

The doubles are sometimes amazingly large, measuring frequently three or four inches diameter over the crown, especially those sorts called bursters.

But whole-blowers and bursters are common to most of the varieties, more particularly the flakes and bizzarres.

The whole-blowers are such whose calyx or outer cup is of long and of equal growth, and opens only at top regularly each way, for the free and equal expansion of the petals all around; and the flowers of this sort, though rather smaller than the bursters, are always more regular in their natural expansion, and require considerably the least trouble in managing their bloom.

Bursters are such, whose cup is large, and swollen as it were, and is very apt to burst open on one side, and the petals thereby break out of compass, and the flowers become very irregular; but by care in assisting it in due time, by tying and opening the calyx a little on the contrary side, it may be made to blow regular, and will be very large and handsome.

But the whole-blowers are the best calculated for those who have but little time to spare, as they will always blow regularly, either in pots or the borders, without any attendance.

The

The properties required to form a good Carnation are, that the stem or flower-stalk be moderately tall, i. e. from about eighteen to thirty inches high, of proportionable strength all the way up, and at the top so firm as to support the flower erect, or at least without nodding or hanging much downward; that the flower be large and double, i. e. have numerous petals quite to the very centre, these long, broad, and regularly spreading; and that when the flower is fully blown, it may be gradually rising in the middle in a spherical manner, and the whole expanding so regularly, that the circumference or outer rim be perfectly circular. The colours should be strong, lively, and elegant; the stripes and other variegations regular in every part, that no great disproportion may appear in the disposition of the colouring throughout the petals of the same flowers. These properties are principally expected in the fine varieties in pots, designed for stage flowers.

What is to be understood by stage flowers, are such of the more capital fine varieties, as produce the most curious flowers, superior in size, form, colours, and variegations, being always cultivated in pots, and by the florists, &c. when coming into bloom, are placed together upon a raised stand or stage covered at top, both to defend the flowers from the weather, whereby to continue them longer in full beauty, and that they may appear to greater advantage in their different varieties of colours, &c.

Their general Use in Gardens.

All the varieties, or any particular approved sorts, both of the Clove and Carnation kinds, are very desirable, ornamental - flowering plants to introduce in all the principal borders and other compartments of the flower-garden and pleasure-ground; beautiful in their numerous, large, elegant flowers, in great variety of different colours, stripes, and variegations, in July and August; and the plants being hardy to grow in any common soil and open situation, all easily propagated by seed, layers, &c. and not difficult of culture in their general growth, they should be admitted plentifully in every garden, proportionate to its extent, both in a principal supply for adorning the general borders, and select sorts planted in pots, as explained in the following observations and directions.

The fine varieties of this beautiful flower are in universal esteem among florists and all curious gardeners, and are of the list of prize flowers, that being raised in their fullest perfection, are carried to florists' feasts, to show for a prize; which practice is still much in

vogue in many parts; and that the flowers usually brought to such places, being the production of many different artists, according to their utmost skill, there are often very curious exhibitions of them, in great variety, surprisingly large and fine.

The fine varieties are commonly cultivated in pots, for these reasons:—first, that they may be readily moved to occasional protection of a frame or awning of mats, &c. from severe frost in winter; for although the plants are hardy enough to live through the winter fully exposed, yet, in severe seasons, they are sometimes so much cut, that they shoot but weakly; but by protecting them from the rigours of hard frosts, they are preserved in vigour, and they will consequently be better prepared for shooting, and will flower in greater perfection. Secondly, it is proper to retain the fine varieties in pots, in order that, when in bloom, they may be placed upon a raised stage, covered at top, calculated both to show the flowers to more advantage, by being raised a foot and half or two feet from the ground, and by the top being covered, it defends them from the scorching rays of the noon-day sun, and from violent rains, &c. which would greatly impair their beauty, and hasten their decay. And lastly, by placing the pots of plants upon a stand or stage, having the posts of which surrounded at bottom by small cisterns or pans of water, prevents creeping insects from coming at the posts thereof to ascend to the flowers, particularly ear-wigs; for these mischievous vermin would otherwise get into the bosom of the flower, and gnaw the sweet part at the bottom of the petals, that they would all drop out of the calyx.

But, as before intimated, a proper quantity of different varieties of some principal sorts should be planted to adorn all the flower-borders and the other conspicuous compartments of the pleasure-ground; for they will thrive in any common soil of a garden, and will flower abundantly in tolerable good perfection; and where there are several different varieties, they will exhibit a delightful ornamental appearance for six weeks, i. e. from the beginning or middle of July until the latter end of August, being their general season of flowering.

Pots of these plants, as also of pinks and sweet-williams, may, by way of curiosity, be brought to bloom early in spring, by placing them in a hot-house or forcing-frame, in January, February, or March. See FORCING-FRAME and STOVE.

The Soil proper for their Culture.

With respect to soil, all the varieties grow freely

freely in almost any common garden earth, and in which produce beautiful flowers; but they are generally superior in that of a light, loamy nature, and of which kind of soil florists generally prepare a compost for their fine varieties intended for pots.

However, for the general plants in borders, beds, &c. any common soil of the garden in these compartments will prove sufficiently applicable to all the varieties, in which they will grow freely, and flower in good perfection; only may observe, that, by addition of some particular soil or compost, the eminent varieties are by the florists sometimes blown superior in size of the flower: though may have very fine flowers produced in beds, borders, pots, &c. of good common garden earth.

But in regard to the improved prepared soil, designed to blow the more curious varieties in the best possible perfection, is as follows.

Provide a quantity of loamy earth, of a light sandy temperature, from an upland or dry pasture field or common, taking the top spit, turf and all, which must be laid in a heap for several months, or a year, and turned over frequently, as directed in the article COMPOSTS; and is then to be mixed with about one third of dry rotten dung of old hot-beds, or rotten neat's dung, and a little sea-sand, forming the whole into a heap again, to lie three, four, or six months, and will be then excellent for use; and if one parcel or heap was mixed with one of these kinds of dungs, and another parcel with the other, for different seasons, it will make a change, and may be found very beneficial in promoting the size of the flowers.

The above compost is as good as can be for those plants, either in pots, or to form into beds.

This compost, or any other earth you may use for this purpose, should not be sifted, but only well broken with the spade and hands. See COMPOSTS.

Their Propagation by Seed.

By seed. — When great quantities of the plants of this species are required either to furnish large grounds, or for market, or that it is intended to raise new varieties, it is easily effected by sowing some seed annually in spring, in common earth, and from which the plants will rise abundantly; and as to varieties, you may always expect several new flowers of good properties from the plants of each sowing, and possibly not one exactly like those from which the seed was saved; and that from the seed of the finest varieties there will probably be many very indifferent as well as good flowers, some single, some dou-

ble, though the singles are always considerably more numerous than the doubles; but it is from the doubles only we are principally to select varieties for our purpose, which are marked when in bloom, to lay for propagation, and the most capital of which potted for the stage, &c. and the others will do for the common flower-borders.

The season for sowing the seed is any time from about the 20th of March to the same time in April.

It grows freely in a bed or border of common earth, of the quality of any light, rich, kitchen-garden mould; though curious persons often sow the fine sorts in pots or boxes, for the convenience of moving them in hot weather, to have only the morning sun; however, you will succeed in either method; and as to sowing on a bed or a border, may either sow it on the surface, and rake it in lightly, or may first rake the surface smooth, then sow the seed on the surface, and sift over as much light earth as will cover it a quarter of an inch deep: observe also the same method in sowing it in pots or boxes, giving moderate refreshments of water in dry weather; and the seed will germinate more freely, and the plants rise regular, and take a free growth.

The plants generally come up in a month after sowing; give occasional waterings and weeding, and in July they will be fit to prick out into nursery beds, which prepare in an open situation three feet wide; and taking advantage of moist weather, prick the plants therein six inches apart, and finish with a general watering, which repeat occasionally till the plants have taken good root. Here let them remain till September, when they will be so well advanced in growth, as to require more room, and should then have their final transplantation into other three-foot wide beds of good earth, in rows lengthways the bed, nine inches asunder, and the same distance in the lines, placing them in the quincunx order; and here they are finally to remain all winter, and until they flower, and have obtained an increase of the approved varieties of doubles, by layers: and until which periods, all the culture they require, is, that if the winter should prove very severe, an occasional shelter of mats, during the hardest frost, will be of much advantage, though not absolutely necessary; and in spring loosen the ground between them with a hoe, keep them always clear from weeds, and when their flower-stalks advance, tie them up to sticks, especially all those that discover by their large flower-pods to be doubles.

They

They will flower in June, July, and August, at which times, as soon as the singles and doubles are distinguishable, all the singles may be drawn out to make room for their betters, the double varieties.

When these are fully blown, examine their properties; the finest may be marked for stage or other principal flowers, and the others as furniture for the borders; all of which may be increased by layers the same year, to treble or perhaps six or eight times their number or more, since each good plant will furnish from three or four, to ten or twelve shoots from the bottom, proper for laying, each of which takes root, and becomes a new plant the same season; and each of these again will in their turn furnish the like number of shoots the following years, for the same work of propagation; and so each variety may be thus annually increased to great numbers, and every plant so obtained, of each respective variety, retains all the properties exactly of the mother plant, which is never the case of those propagated by seed; though from seedlings all our fine new flowers are always first obtained.

Therefore as soon as the seedlings show bloom, proceed to the work of propagation by layers of all the doubles among them, or at least as many of them as you shall approve; and the following is the method of laying them.

Their Propagation by Layers.

By layers.—We observed above, that the propagation of these plants by layers is the only method by which we can with certainty continue any particular variety, either new or old; since every layer, becoming a new plant, always produces a flower exactly in size, colour, and character, as that of its parent; and that being layed in summer, they form roots in six weeks, and be fit to transplant, and each produce flowers the year following, as well as each furnish a farther supply of shoots for more layers.

The proper parts for layers are those leafy shoots arising near the crown of the root, which, when about five, six, or eight inches long, are of a proper degree of growth for layers, and which, as they remain on the parent plants, being layed, the body part into the earth an inch or two deep, with the tops above ground, the inserted part strikes root in a few weeks, to transplant from the old stool the same year, and will flower in perfection the year following.

The general season for this work is June, July, and beginning of August, as then the shoots will be arrived at a proper growth for

that operation; and the sooner it is done after the shoots are ready, the better, that they may have sufficient time to root well, and to acquire strength before winter: those layed in June and July will be fit to take off in August and September, so will form fine plants by October.

The method of performing the work is as follows.—First provide a quantity of small hooked sticks for pegs, three or four inches long, with which to peg the layers down in the ground; also get ready, in a barrow or basket, a quantity of light, rich mould, to raise the earth, if occasion, around each plant; and provide also a sharp penknife. Having all these ready, then proceed to the work of laying; first strip off all the under leaves from the body of the shoots, and shorten those at top an inch or two evenly, and then fixing upon a strong joint about the middle of the shoot, and on the back or under side thereof, cut with your knife the joint half way through, slantingly, directing the knife upward, so as to slit the shoot up the middle almost to the next joint above; by which you form a kind of tongue on the back or under side of the shoot, observing that the swelling, skinny part of the joint, remaining at the bottom of the tongue, must be trimmed off, that nothing may obstruct the issuing of the fibres, for the layers always form their roots at that part; this done, loosen the earth around the plant, and, if necessary, add some fresh mould, to raise it for the more ready reception of the layers; then with your fingers make a hollow or drill in the earth to receive the layer, which bend gently down horizontally with the cut part, into the opening, raising the top upright, so as to keep the gash or slit part of the layer open, and with one of the hooked sticks peg down the body of the layer, to secure it in its proper place and position, still preserving the top erect, and the slit open, and draw the earth over it an inch or two, bringing it close about the erect part of the shoot, up to the leaves; proceeding in the same manner with the others; and when all the shoots of each plant are thus layed, give directly some water to settle the earth close, and the work is finished, repeating the waterings often in dry weather; and in five or six weeks the layers will have formed good roots, when they should be separated with a knife from the old plants, and planted in beds or pots, as may be convenient, in the following manner.

Note, Carnations may likewise be propagated by pipings or cuttings, as directed in the propagation of the pink tribe, though the layers generally make the best plants, and that

that method is most eligible for general practice.

Taking off, and transplanting the Layers.

The layers, as above observed, are generally well rooted in six weeks after laying, which you will observe by opening the earth a little, and examining the bottom, or root part; and if it has emitted plenty of radical fibres, they should be taken off, and planted out separately, to form distinct plants.

They must be cut or separated with a knife from the old plant, gently raising them out of the earth with the point of a knife or trowel, so as to preserve the fibres or roots of the layers as entire as possible; and when thus taken up, cut off the naked sticky part at bottom close to the root, and trim the tops of the leaves a little; they are then ready for planting, either into beds or pots, but rather into nursery-beds of good earth, about six weeks, and then the fine sorts may be potted; therefore chusing a bed or border of rich light earth, let it be then neatly digged, and the surface raked smooth, and here plant the layers with a dibble, at six or eight inches distance, give directly a good watering, and repeat it in dry weather, every day or two, for a week or a fortnight, when the plants will have taken fresh root, and begin to advance in growth.

In this bed let them take their growth till October; then those of the fine varieties may be potted in small pots (thirty-twos or forty-eights) for moving to occasional shelter from hard frosts till spring, then transplanted into large pots to remain to flower; therefore, at the above-mentioned time in autumn, take up the layers of the prime sorts from the nursery-beds, with small balls of earth about their roots, plant one in each small pot, and give a moderate watering, and place them in a warm situation in the full air till November; then move them to occasional shelter, as directed in their winter culture.

Or may plant the layers at once into large pots in autumn; but these are not so convenient to remove to shelter in winter, as small pots, because they take up much room in a frame, &c. besides, by having the layers in small pots all winter when they receive hardly any growth, and transplanting them into large pots of fresh earth in spring, it proves very beneficial to the plants. See their *Spring Culture*.

The more common sorts may either at the above time, in autumn, be transplanted into the borders or other compartments of the pleasure-ground, where they are to remain to flower, or may be continued in the beds until spring; and then a due quantity may be dis-

posed in the borders, or some retained in the same bed, for flowering, as may be convenient.

Their Winter Culture.

In November the fine varieties in pots should be moved to a sunny, sheltered situation for the winter; and if placed in a frame, &c. to have occasional protection from hard frost, it will be of much advantage; therefore where there are any garden-frames at liberty, the pots may be placed close together therein; or if the bed is raised three, four, or six inches with light dry earth, sand, or ashes, and so plunge the pots in it to their rims, it will be a greater protection for their roots, covering them occasionally with the glasses in hard frosts, &c. but for want of frames, a bed, prepared as above, may be arched over with hoops, to be covered occasionally with mats.

Under either of those shelters, the plants are to be covered with glasses or mats, only in time of severe frost and great snows, but must enjoy the full air in all open weathers, by having all covering entirely off; for a moderate frost can no ways affect them; and if much covered, it would draw them up weak and tender. Do not however omit, in severe weather, to afford them the above shelter, which will preserve the plants in greater health and vigour than if fully exposed to all weathers during the winter.

Be careful also that the earth in none of the pots is rendered very wet by the hole at bottom being too close stopped to detain the moisture.

Thus continue your care of the potted plants till spring, and then shift them into large pots to remain to blow, as directed in their spring culture.

In respect to those in the open beds, although they commonly stand the winter tolerably, yet where any choice sorts are continued together in the nursery beds, if you have any spare frames, or the beds arched over, to be covered with mats or long dry litter in severe frosts, it will be of much advantage.

Their Spring Culture, transplanting into Borders, Pots, &c. shifting into larger Pots, &c.

In the latter end of February, or some time in March, or early part of April, the layers should have their final transplantation into borders, pots, &c. those as have remained all winter in nursery-beds should now be planted out, a proper supply into the different flower-borders and pots, &c. finally to remain for flowering; and those of the select kinds, as were planted in small pots in autumn, or such of them as still remain in beds,

beds, and that you intend shall blow in pots, should be transplanted with balls into the large pots, where they are to remain for flowering.

In transplanting the layers from the nursery-beds, finally into the borders or pots, should be careful to remove them with full roots; and if with a small clump of earth adhering, it will be of additional advantage; or, however, where this is not convenient, preserve the roots as entire as possible; plant them with the same care, and they will readily strike fresh root and grow freely; observing, in this their final removal, to introduce a sufficiency in the principal flower-borders, &c. in some regular order; and those which are designed for pots should be planted now at once into large sizes, as mentioned hereafter, in which to remain for flowering, and furnish layers for future propagation.

But the capital varieties which were planted in small pots in autumn, as before observed, should now, i. e. end of February, or some time in March, or beginning of April, be transplanted into the larger pots to remain.

The pots proper for their reception for flowering should be sixteens, but not less than twenty-fours; for they should be nine or ten inches at least in the clear at top, but if a foot the better, that there may be due room to lay the layers, at the proper season, for a further increase, which is an essential point to be considered. The pots being ready, put some pieces of tile or oyster-shells over the holes at bottom, and fill them half way with earth; then turn the plants out of the small pots, &c. with the ball of earth about their roots, and after taking away a little of the earth around the sides of the ball, place one plant in each of the large pots, filling up the vacancy round the ball with more fresh compost, bringing it also close up about the body of the plant, which should stand nearly as high as the rim of the pot; and finish each pot with a moderate watering.

Many persons plant two plants in each large pot; but when there is only one, they flower stronger, make stronger shoots for layers, and there is more room to lay them.

The plants being thus potted, place them in a sheltered sunny situation in the full air, and in dry weather supply them with water twice or thrice a week, and here let them remain till they are considerably advanced towards flowering; then the fine sorts may be placed on the Carnation stage: where there is such conveniencies, observe as follow.

Summer Culture, placing them on the Stage, and Management when in Bloom, &c.

During dry warm weather continue the care

of watering those in pots every day or two. Likewise clear out all weeds, and at times lightly stir the surface to prevent the earth from binding; which will be beneficial to the plants, and preserve an air of neatness.

In May and June the flower-stems of the plants will advance a-pace, when sticks should be placed for their support, both to all those in the borders, as well as to those in the pots, having sticks for this purpose about two feet and half, or a yard long, either round or square, but perfectly straight and tapering from the bottom, especially those for the more curious sorts in pots; sharpening the lower end, thrust one down by every plant, to which tie the flower-stems in a neat manner, which repeat at different times, according as they advance in height.

In June or beginning of July the plants will be considerably advanced towards flowering, when those intended for the stage should be placed thereon, both to be out of the way of creeping insects, particularly ear-wigs, which, as before observed, eat the petals off at their base, to the destruction of the flowers; so to prevent their depredation, the posts or supporters of the stage should be surrounded at bottom by small cisterns of water, as hereafter directed, that the vermin cannot come at the posts, to creep up to the flowers; and that by placing the plants on a stage, having the platform eighteen inches or two feet high, the flowers are viewed to more advantage; and if there is erected an awning over the top, supported four feet above the platform, the flowers being hereby screened from the vehement heat of the mid-day sun, and defended from heavy rains, are continued much longer in beauty.

Some Carnation stages are constructed upon very elegant plans, both to render them useful and ornamental.

But as to the general construction of a common Carnation stage, it is formed entirely of slight timber-work, thus—A boarded platform is erected, at eighteen inches or two feet height, formed by two ranges of planks, to contain two rows of pots lengthways, proportionable to the number intended to be placed thereon; and which is supported on posts, ranged either in one row along under the middle of the platform, or in two ranges, one on each side; and over the top is erected a roof of open work, five or six feet high, to be covered with painted canvas, &c. for the protection of the flowers, supported either by a range of neat posts on each side, or by one row, ranging along the middle between the planks of the platform, which is the most eligible;

eligible; the roof may be formed either archways, or like the ridge of a house, having the arches or spars about a foot asunder, and stiffened by thin slips of deal carried across them the whole length of the stage; and the roof thus formed may be covered either with coarse canvas painted white, or strong brown paper painted the same colour with white lead, or with strong white paper brushed over with linseed-oil to render it proof against wet, or, in default of either of these, may cover it with neat garden-mats, lengthways; either of which being designed only just to screen the flowers from the scorching sun and great rains, that their beauty may be continued as long as possible.

All the wood-work of the stage should be painted white, both to preserve it from the weather, and give it a more lively appearance.

In constructing Carnation stages, some are so curious as to contrive sticks for the support of the flower-stalks, fixed to the work of the stage, by means of small neat rails carried along lengthways the stage, just over the place where each row of pots stand, and from which rails, upright sticks, half an inch thick, are carried to another such rail above, placing them at such distances, that there be two to each pot, and so train the flower-stems up to the outside of the sticks.

With respect to the cisterns of water above mentioned, to surround the supporters of the stage, they are formed by earthen or leaden pans, about fifteen inches wide, and three or four deep, having a hollow or vacancy in the middle five or six inches wide, like a socket, to receive the posts, and is formed by a raised rim in the middle, equal in height to that of the circumference; and the hollow or socket so formed is to receive the bottom of the posts quite through to the ground, and the space between the outer and inner rim is filled with water; so that each post standing in the middle of such a cistern, sufficiently guards against creeping insects, for they will not attempt to cross the water.

These cisterns may be had at any of the potters that make garden-pots; and if you chuse them of lead, every plumber knows their construction.

But as making the above-described Carnation stage may not be convenient to every one, I shall describe one of a more cheap and easy construction. Provide some flat earthen pans about fifteen or eighteen inches diameter, and three or four deep, which place by pairs opposite two feet apart, and six or eight feet between each pair lengthways; and in each of

these pans, whelm a large garden-pot bottom upward, and across each pair of pots lay a flat piece of timber, two feet six inches long, and two or three inches thick; then having long planks, lay these across the timbers lengthways, in two rows, and your stage is formed, then place two rows of pots upon the planks, and fill the pans with water, to keep off insects.

For want of a covered stage to screen the flowers, you may contrive a kind of small umbrellas or round-spreading caps, either of tin or strong paper or canvas, nine or ten inches diameter, one for each plant, having a socket in the middle to receive the tops of the support-stick; those umbrellas which are formed of tin are the best, and may be had at the tin-ware shops; but if you make them of paper or canvas, first form little round frames, having the rim formed with slips of lead, wire, cane, &c. the above width, with cross slips of the same materials, contriving a socket of lead or tin in the middle for the support stick to go quite through, as just observed; and upon these frames paste or sew some strong thick paper or canvas, which paint with oil-colour, that they may stand the weather; either of which covers are placed over the flowers by running the support stick up through the hole or socket in the middle, and resting the cap upon a piece of wire run through, or any thing similar fixed across the stick, at such height from the flower as to screen it effectually from the sun and rains.

Give attention to continue to tie up neatly the flower-stalks of the plants in general, as they advance in stature. When they are arrived at their full height, the curious in Carnations support them erect at top with wires, having a small eye or ring at one end, for the reception of the flower-stalk, so put the other end into holes made in the support-sticks; these wires should be five or six inches long, and several holes are made in the upper part of the sticks, the first at the height of the bottom of the flower-pod, the others above that, an inch or two distant, and place the wires in the holes lower or higher, that the eye or ring may be just even with the base of the calyx, to support the flower in an upright position; and by drawing the wire less or more out, the flower is preserved at any distance from the support as shall seem necessary, to give it proper room to expand; and if two or three of the like wires are placed also in the lower parts of the support-sticks, placing the stem of the flowers also in the eye of the wires, all the tyings of bals, &c. may be cut away.

To

To have as large flowers as possible, curious florists clear off all side-shoots from the flower-stem, suffering only one or two of the main or top buds to remain to flower.

When the flowers begin to open, attendance should be given to assist the fine varieties, to promote their regular expansion, particularly the large burster kinds, they being apt to burst open on one side, and, unless assisted by a little art, the petals sometimes break out of compass, and the flower becomes very irregular; therefore attending occasionally at that period, observe, as soon as the calyx begins to break, to cut it a little open at two other places in the indentings at top, with narrow-pointed scissors, that the openings be at equal distances, and hereby the more regular expansion of the petals will be promoted; observing, if one side of any flower comes out faster than another, and if the plants are in pots, to turn the pot about, that the other side of the flower be next the sun, which will also greatly assist the more regular expansion of the petals.

Likewise when intended to blow any particular fine flowers as large and spreading as possible, florists place spreading paper collars round the bottom of the flowers, on which to spread the petals to their utmost expansion; these collars are made of stiff white paper, cut circular, about three or four inches over, having a hole in the middle to receive the bottom of the flower, and one side cut open to admit it; which is to be placed round the bottom of the petals within of the calyx, the leaves of which are made to spread flat for its support; and then spread or draw out the petals upon the collar, to their full width and extent, the longest ones undermost, and the next longest upon these, and so of the rest quite to the middle, observing that the collar must no where appear wider than the flower; thus a Carnation may be rendered very large and handsome; but we do not recommend the practice as absolutely necessary, only mention it as the practice of those who have much leisure-time, and who take a particular pleasure in exhibiting very large Carnations; and indeed, a Carnation that expands regular in its natural way, whether whole-blower or burster, although they do not appear so large as the collared flowers, yet I should think they must appear more natural and beautiful; and even the largest bursters may be made to blow very regular, by just slitting the calyx, or sometimes tying it when bursting very irregularly, as before directed.

But as the whole-blowers always expand regular without any trouble of opening the calyx, and although not so large as the burst-

ers, yet have great beauty, and are the most proper for general culture, for those who have much other business to mind.

Continue the care of watering the pots, which in dry hot weather will be necessary every day, being essential to promote the size of the flowers, and increase the strength of the shoots of the plants at bottom, for layers.

And as in June and July the layer-shoots will be arrived at proper growth for laying, should also be layed to continue your increase of the approved varieties, and so continue laying the shoots of each year's growth at the above season, managing them always as before directed.

As to the border Carnations, i. e. such as you intend shall flower in borders or beds in the full ground, any of the varieties may be employed, and their propagation both by seed and layers is the same as already directed; the season for transplanting them into the places of their final destination for flowering, is also either in autumn or spring, that is, October or beginning of November for the autumn planting, and for that of the spring, any time in March, or first fortnight in April; removing them with little balls about their roots, planting them a foot and half to two feet from the edge of the border; and as to culture, it is principally tying up the flower-stalks as they advance in stature, and to make layers of all the approved sorts annually, in June or July, whereby to obtain a farther increase of young plants, for successional flowering the following year; for, although the old plants will continue three or four years, they never blow so strong and large in full perfection as in the first and second year of flowering, in which the plants are rather of a biennial nature; so should always raise a fresh supply every year or two by layers; or occasionally by pipings, as directed for the pinks.

General Observations.

It may be proper here to observe, that, as the Gilliflowers in general, both of the Clove and Carnation tribe, are principally of the biennial-perennial nature; and that, although the same individual plants will survive and continue several years, they generally, after the first and second year of flowering, become mostly of a more infirm, straggling growth, not flowering in equal perfection as the one and two-years old plants, it is therefore proper to continue raising some every year from layers, &c. of the approved varieties, in order thereby to have a successional stock of young full-flowering plants.

Carnations in general, whether for pots, or as border-flowers, their propagation and culture is always the same as already directed.

under the two respective heads of propagation by seed, and by layers: raised and treated according to these directions, become good plants the same season, ~~at~~ for transplanting finally in autumn or spring following, either into pots or the open borders, and they will flower in the utmost perfection the succeeding summer.

And that the general season for planting out finally all sorts, seedlings and layers from the nursery-beds, &c. into the places where you design they shall flower, either in pots or the full ground, is October or beginning of November, or in spring any time from the latter end of February to the beginning or middle of April; removing them with small balls or with their full roots, plant them singly, that is, one in a place, and always finish with a watering to settle the earth close about the roots.

Always in May and June give attendance to tie up the flower-stalks to support-sticks, repeating it occasionally; for this looks neat to the eye, and promotes the size and regularity of the flowers.

Every spring it may be proper to sow some seed to obtain varieties.

Every summer, in June or July, make layers for increase of all the approved double sorts, whether Clove or Carnation, of the Flake, Bizarre, Piquette, or Painted Lady kinds.

Or sometimes propagated by cuttings and pipings, as directed in the propagation of Pinks; but these are not so successful in general as layers.

As to the old roots, having a good increase of new young plants by layers, you may either eradicate them, or use them in different parts of the pleasure-ground in vacant spaces of large borders, &c. for being perennial, they will endure several years, though the new plants always afford the largest and finest flowers.

Saving the Seed.

All the varieties of Carnations, both single and double-flowered plants, produce abundance of seed, which ripens freely in August and September.

But to have the greater chance of obtaining seeds for raising fine new varieties, you should mark some of the finest flowers when in bloom; and all those of bad colours, or of other bad properties, should be removed, to prevent any admixture of the farina. For the same reason, it is also of importance, for the purpose of seed, to keep the flakes, bizarres, piquettes, &c. as far distant as possible, whereby each of these sorts may, even from seed, be preserved tolerably permanent, though each in itself profuse in many varieties of its own kind.

It is also worth observing, that seedling plants are generally more prolific in good seed, than such as have been long increased from year to year by layers.

The ripening of the seeds should be attended to in August and September, in order to gather the pods in due time, according as they ripen, in dry weather, which spread on paper, or shelves, &c. to dry; then rub out the seed, and put it up in dry papers till sowing-time in spring.

Second Head of Dianthus.

Dianthus, comprising those kinds of Dianthus commonly denominated Pinks.

The principal species of the Pink kind are distinguishable from the Carnation tribe of the first class, by the shoots and leaves being considerably shorter, smaller, more numerous, and tufted; and the flower-stalks shorter, the flowers smaller, and more crenated. All of which species are hardy, herbaceous, fibrous-rooted plants of the flowery tribe, for the pleasure-ground; mostly perennial, or of the biennial-perennial kinds, and some annual-biennial; and all of which admit of several eminent varieties of great merit for the ornament of the pleasure-garden.

There are about four species, which may be admitted into the flower-garden, three perennial, and one annual.

Class and order, the same as the Carnation. See the *First Head*.

The first three are perennials, or biennial-perennials, viz.

1. DIANTHUS *deltoides*.

The Common Pink.] Dianthus with numerous short leafy shoots crowning the root, in a tufted head close to the ground, closely garnished with small narrow leaves, and from the ends of the shoots many erect flower-stalks from about six to fifteen inches high, terminated by solitary flowers, having lanceolate double scales to the calyx, and crenated petals, and with single and double flowers of different colours, and variegations in the varieties.

2. DIANTHUS *virginicus*.

Maiden Pink, commonly called Matted Pink.] Dianthus with numerous low, trailing, leafy shoots, crowning the root in a matted tuft, close to the ground, garnished with short, awl-shaped, deep-green, grassy leaves; and many erect flower-stalks six or eight inches high, terminated each by one red flower having very short calycinal scales, and crenated petals.

Variety.] With flesh-coloured flowers.

3. DIANTHUS *glaucus*.

Glaucus, or Grey leaved Mountain Pink.] Dianthus with many low leafy shoots crown-
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ing the root in a cluster close to the ground; very short, narrow, grey-coloured leaves, and many erect, branchy flower-stalks eight or ten inches high, terminated by large white flowers, having a purple circle in the bottom; and with four lanceolate, calycinal scales, and crenated petals.

Variety.] With double flowers.

These three species and following varieties are the sorts of Pinks the most commonly cultivated, all of which are perennial.

The most material Varieties are,

Common Red Pink.—Produces flower-stalks eight or ten inches high, and small red flowers.

Damask Pink.—Produces flower-stalks six or eight inches high, and reddish-purple flowers.

White Pink.—Producing flower-stalks eight or ten inches high, and very white flowers.

White-fringed Pink.—Produces flower-stalks six or eight inches high, and pure white flowers, having the edges of the petals considerably jagged or fringed.

Pheasant's-eye Pink.—Producing firm flower-stalks eight or ten inches high, and large whitish and blush-coloured flowers, having a dark-purple spot or eye in the middle, hence called Pheasant's-eye Pink.

Of this sort there are numerous varieties obtained from seed, all of them generally retaining the purple eye in the middle, but differing from each other in size, doubleness, colour, and the size and colour of the eye, &c. so that the different intermediate varieties have names according to the fancy of the person who first raised each new variety.

Red Cob Pink.—Producing flower-stalks twelve or fifteen inches high, and large bright red flowers.

White Cob Pink.—Tall stems, large white flowers.

Painted-Lady Pink.—Bright purplish-red, white, &c.

Clove Pink.—Large, deep-red flowers, strongly clove-scented.

Of each of the above varieties there are single and double flowers: the singles are but little regarded, as enough of them may be obtained from seed, and from which also the doubles were first obtained; but the doubles being large, multipetalous, and more beautiful, are the only sorts worth general culture, and which being once obtained, they may be continued and increased abundantly by layers, slips, cuttings, and pipings. See their *Propagation*.

As to the flowering season of all the varieties, some of the small sorts, such as the da-

mask, and white shaggy Pink, often flower in May, or early in June; which are succeeded by the others, continuing in succession till July, and all furnishing seed in autumn.

4. *DIANTHUS chinensis.*

Chinese, or Indian Pink.] *Dianthus* with upright, firm flower-stalks, branching erectly on every side, a foot or fifteen inches high, and all the branches terminated by solitary flowers; having awl-shaped, spreading, calycinal scales equalling the tube, and indented petals; and with single and double flowers of different colours, and variegations in the varieties.—Flowering from July till November.

Varieties are,] With bright-red single and double flowers—with purple single and double flowers—white single and double flowers—variegated single and double flowers—Imperial large-flowered; of each of which are many intermediate varieties in respect to the shades, and disposition of the colourings, especially of the variegated kinds, which are in general lively and elegant; the doubles in particular are singularly beautiful, being large and very full of petals to the very centre; all of which varieties may be considered both as annual and biennial, for they, rising from seed in spring, flower the same year in summer, and commonly perish in winter, especially in moist soils; but if planted in dry warm ground, sheltered from severe frost, or some in pots placed in a garden-frame in winter, the roots will continue two years, and flower strongest the second season of their bloom: they all flower abundantly from July till the beginning of winter, furnishing plenty of seed in autumn, from which the plants are raised plentifully in spring, either in the full ground or in hot-beds, to bring them more forward.

All the flowers of the above four species of Pinks, and their varieties, are in their single state composed of five petals; but in their compound or double state, the petals are multiplied, and the first and fourth species are very prolific in double varieties, which are often large and very full of petals, continued in many series to the centre; and both singles and doubles arise from seed, but often ten or twenty or more singles to one double.

They flower in June and July; the annual sort continues till autumn, and all of them produce seed in plenty.

Use in Gardens, &c. of all the Sorts.

All the above four species of the Pink tribe, and respective varieties, considered as hardy flowering plants, are proper furniture for the compartments of the pleasure-ground; but the first species, *Dianthus deltoides*, and varieties, have superior merit both for the beauty and

fragrance of their flowers, and are the sorts in greatest estimation for general culture, as plants of ornament; and as each plant of any tolerable size produces numerous flower-stalks, all terminated by flowers, renders them choice furniture for the common flower-borders, or to embellish the vacant spaces in the fronts of small shrubby clumps. The second and third species are also retained in many gardens, to increase the variety in the collection of flowering perennials. And the fourth species, *Dianthus chinensis*, has great merit, not only for the liveliness of their beautiful flowers, but also for the long continuance of their bloom, which in the same plant is often continued in plentiful succession three or four months; but have no fragrance.

Observe that, as all the perennial Pinks, being both of a tufty and spreading growth, and produce many flower-stalks, they should be disposed singly, only one plant in a place; but the annual sort being different, it is rather proper to dispose them in patches of three or four plants in each.

Any of the sorts may also be cultivated in pots occasionally, to place in fore-courts, or to adorn any other principal compartment.

Sometimes the Common Pink and varieties are employed to form edgings to beds or borders; but as in one year they are apt to spread greatly out of compass, and become irregular, they are not well adapted for that use. However, if they are used for that purpose, the edging should be cut in on each side, once or twice a year, with garden sheers.

But of the different varieties of the *Dianthus deltoides*, or Common Pink, it may be observed, that although the same plants continue several years, as intimated of the Carnations, they, after two or three years' growth, are apt to run weakly and straggling, and produce inferior flowers; and in that case, being somewhat of the biennial - perennial kind, should generally raise supplies of young plants every year or two, of the different approved sorts, from slips, cuttings, pipings, layers, &c. as hereafter explained.

Propagation, &c., of the Perennial Sorts.

The first, second, and third species, are propagated by seed, layers, slips, cuttings, and pipings.

By Seed.—Great numbers of plants may be raised with the utmost facility by seed, in a bed or border of common earth in spring, which will all flower the year following, and among which there will probably be many double flowers, and some new varieties, particularly of the first sort, Common Pink.—The proper season for sowing is March and

April. Chuse a bed of rich light earth, dig it neatly, and form the surface even, then sow the seed and rake it in; or may practise as directed for the Carnations; the plants will appear in a month or five weeks, which, in June or July, when two or three inches high, plant out into nursery beds till October or spring following, and then to be transplanted with balls into the places where they are to flower; or they may remain in the beds for flowering, as observed of the Carnation seedlings. When they show bloom, the singles may be drawn out to give room for the double kinds, which you may continue and increase abundantly, by layers, slips, cuttings, &c. and all the plants so raised produce flowers, having all the properties of those of the mother plant.

By Layers.—The same method is to be observed for those as for the Carnations, and June, July, and beginning of August, is the time to perform this work, managing them in every respect as the Carnation layers: or if in spring, some large plants which have spread considerably, have all their shoots covered with earth an inch or two deep, without taking pains to slit or tongue them, as in laying Carnations, many of them will emit fibres and be well rooted, and fit to transplant in autumn, each a distinct plant.

By Slips.—In spring, any good fresh plants of the approved varieties may be increased by dividing them into many slips, either by slipping off the younger shoots from the sides of the main ones, which, though destitute of roots, many of them will readily emit fibres and grow; or may divide or slip the plants quite down to the roots, where practicable, so as to preserve as many fibres to each slip as possible; but slips by either method, if done in February, March, or April, will readily succeed, and form good plants by the end of summer, observing, that the short bushy plants are more eligible for slipping, than such that are long and straggling; and slips from about three or four to six or eight inches long, will succeed. Having therefore slipped a proper quantity for planting, let them be planted in a bed or border of good earth, six inches asunder, putting them down almost to their tops, give them water directly, and repeat it occasionally, in dry weather; they will readily take root, grow freely, and form good plants by Michaelmas, when, or in spring after, they may be transplanted with balls, where you design them to flower.

By Cuttings or Pipings.—June and July is the best time for this work, when the young shoots of the year will be advanced a proper length

length to form cuttings of two or three inches long, which planted, will readily grow, and form good plants the same year;—this method is commonly called piping, because that part of the young shoots proper for planting used to be generally detached for that purpose, by pulling them out of their socket at a joint, leaving a hollow like a pipe, as it were; but the following is the general successful practice.

Observe therefore, when the shoots of the same year's growth are of a proper length, and proportionably firm, not the long, slender ones, but those of somewhat robust growth; and of which take off a proper quantity four or five inches long, then trim off all the lower leaves, and cut those at top pretty short, and then at about two or three inches from the top, cut them clean through transversely at a joint, casting the lower part away, and reserve the top for planting, which, if two or three inches long, is a proper cutting; being thus prepared, then having some rich light earth broken perfectly fine, either in a bed, border, or in large pots, making the surface smooth, plant the cuttings as follows: take them one by one by their tops, and thrust the lower end into the earth, they will readily make way for themselves; so putting them down full half way, and an inch or two asunder, and give directly a good watering out of a pot with the rose on; they should then be covered air-tight with bell or hand glasses, which will greatly facilitate their rooting; nor need they be taken off till the cuttings are so far rooted as to begin to grow, nor need they be much shaded; and the watering, which must be often repeated, may be applied around the outside of the glasses, a sufficiency of which will soak to the mould within for the benefit of the cuttings; but, for want of glasses, they may be shaded in the heat of the day with mats, and frequently watered.

They will thus be rooted in a month or six weeks, and advance fast in growth, and should then be fully exposed; and, when well rooted and advanced considerably at top, should be transplanted, gently raising them out of the earth with their roots as entire as possible, and prick them in a bed of good earth five or six inches apart, to remain till autumn, or spring following; then may be removed to the places allotted for them to flower.

The planting by pipings is nearly the same as by cuttings, only that, instead of cutting off at a joint, may take the head of the shoot in betwixt the finger and thumb, and draw it asunder at the joint, by which it often comes out of its socket, as before observed,

and also frequently separates clean off at a joint; not very material which; only observing in either case, to trim the bottom of each even to the joint: they are then to be planted and managed exactly as directed above.

Propagation, &c. of the Annual Sort.

The Dianthus Chinenfis—Being rather of the Annual tribe, or at most biennial, is always raised from seed annually in spring, though if the plants have a dry warm soil in winter, they will abide two years, and produce stronger flower-stems, more numerous and larger flowers than the same year's seedlings.

As the plants, however, are easily raised in great plenty from seed, and as they are rather apt to go off in winter, a fresh supply should be annually raised from seed, sown either in a hot-bed in March, to bring the plants forward, or sown in a bed of natural earth, any time in April or beginning of May; in which may either sow the seed on the surface, and raked in, or first rake the ground smooth, sow the seed and sift earth over, to a quarter of an inch deep, or sow it in drills that depth; but to bring the plants as forward as possible, should generally sow the seed in a hot-bed, with other annuals of similar quality, such as African marigold, China aster, &c. (see ANNUAL PLANTS).—And in May or June, when the plants of either method of sowing are a month old, about two or three inches high, prick them out from the seed-bed into a bed of good rich earth, in rows six inches asunder, giving water, and occasional shade till rooted; and after having a month's growth here, they will be of a proper size for final transplantation, taking them up with balls, and planting them into the different compartments of the pleasure-ground, in patches of three or four plants in each, in which they will appear more conspicuous in flower than if disposed singly.

Saving the Seeds of all the Sorts.

All the sorts of Pinks of this class afford seed plentifully in August and September, which should then be gathered in the pods in dry weather, spread to dry and harden on papers, then rubbed out and put up for the spring service.

Third Head of Dianthus.

Comprehending those sorts of *Dianthus* commonly called Sweet-Williams.

This class comprises but one species, which admits of numerous elegant varieties, all hardy, herbaceous, fibrous-rooted, flowery plants, of the biennial-perennial kind; distinguishable from the two former classes of *Dianthus*, by having larger shoots, much broader leaves, and larger stems of upright firm growth, and
by

by the flowers growing all at top of the stalks in aggregate bunches.

Class, order, and characters, the same as the other species of *Dianthus*. See the *First Head*.

The species is,

DIANTHUS barbatus.

Bearded Dianthus, commonly called Sweet-William.]—*Dianthus* with many thick, leafy shoots crowning the root, in a cluster close to the ground, garnished with spear-shaped, evergreen leaves, from half an inch to two inches broad, and upright, firm flower-stems, branching erectly two or three feet high, having all the branches and main stem crowned by numerous flowers in aggregate bunches of different colours, and variegations in the varieties.

The varieties may be divided in two classes, Narrow-leaved and broad-leaved kinds; the narrow-leaved sorts being remarkable for being the most productive of variegated flowers, and many doubles.

Varieties are,

Narrow-leaved kind.]—With narrow leaves and deep red flowers—With pale red flowers—Pale red, and flesh-coloured flowers—Purplish white-eyed flowers—Snow-white flowers—White and flesh-coloured flowers—White and purple flowers—White spotted flowers—Red flowers and white borders, called Painted Lady Sweet William; and with many other intermediate shades of colours and variegations, and which frequently vary in the flowers of the same aggregate; there are also single and double flowers of each variety. Among the doubles of this class of narrow leaves, is that sort called the Mule, having a bright-red double flower in smallish aggregates, said to have been accidentally produced from the seed of a Pink, or Carnation, impregnated by the effluvia of a Sweet William, hence is called the Mule, or Sweet William Pink, &c.

Broad-leaved kinds.]—With broad leaves and tall deep-red flowers—Tall flesh-coloured flowers—Pure white flowers—White dotted flowers—Striped leaves and red flowers—Large, double, rose-coloured, sweet-scented flowers—Large, double, deep purplish, burster flowers—Double variegated flowers.

All the varieties of both classes, Narrow and Broad-leaved, are hardy, herbaceous, evergreen biennial-perennials, rising the first year with a large bushy tuft of leaves and leafy shoots, continuing green the year round, and the second year shoot up flower-stems, producing flowers in June and July, succeeded by abundance of seed in autumn.

The corolla, in all these varieties, in its sin-

gle characteristic state, is composed each of five petals, but in the double flowers it is large and multipetalous, and both single and double are obtained from seed; though probably ten, twenty, or more singles to one double, and the narrow-leaved kinds are generally the most productive of doubles, which are more commonly variegated than of plain red or white colours.

But both singles and doubles are extremely elegant, and in a great degree ornamental garden flowers, which terminating the stalks and branches in large close bunches, like umbels, continuing six weeks in bloom, but have no fragrance; so that their merit consists entirely in their ornamental appearance for the decoration of the borders, and other parts of the pleasure-ground, in which they are exceedingly conspicuous and grand; and as they are all so hardy as to prosper in any common soil of a garden, and may be raised abundantly from seed in the full ground, a good stock of them should always be maintained by an annual sowing, and the fine doubles by layers, &c. See their *Propagation*.

Some of the large double sorts may also be cultivated in pots, to place occasionally to adorn fore-courts, or other principal districts of a garden.

The plants, although in general of several years' duration, yet, after the first year of flowering, the shoots generally become long, straggling, and of unightly, dwindling growth, so that being of a biennial nature, a supply should be raised every year from seed or layers, for the one-year-old plants are always close and bushy, and flower much stronger than those of older standing; and the following is their method of propagation:

Their Propagation.

They are propagated by seed, layers, and slips, all of which is easily effected in the full ground.

By Seed.—March and April is the season for sowing; generally allot an open situation in any bed or border of light earth, in which, being fresh-dugged, sow the seed on the surface and rake it in evenly, or it may be sown in drills; in a fortnight or three weeks, the plants will come up, which in June or July should be transplanted into nursery-beds of common earth, in rows six or eight inches distant, to remain until autumn or spring following, then taken up with balls about their roots, and planted in the places where they are to flower.

By Layers.—June and July is the proper season, and the same method is to be observed in every respect as for the carnations, which see; so it will be unnecessary to repeat it here.

This

This is the only method of propagation to continue the fine double-flowered varieties, which being layed, give frequent waterings in dry weather, and they will be well rooted in six or seven weeks; then should be separated from the old plant, and planted in a bed of light soil; and in October some of them should be potted, to move to occasional shelter from frost; for although the doubles are almost as hardy as the single kind, yet being more choice, it is necessary always to have some of the finest in pots, that they may have protection in severe winter weather, observing the same as for the choice carnations.

By Slips.—February, March, April, and October, is the time for this work, observing, if it is to be performed upon the year-old plants, they must be slipped quite down to the roots, so as to have fibres to each slip, then may plant them at once where they are to flower; they will sometimes make as good plants as seedlings and layers, and will generally flower in equal perfection.

Saving the Seed.

The Sweet-williams are remarkably prolific in seed, particularly all single varieties, and from which both single and double sorts are obtained.

If you would cultivate only the finest varieties, the flowers which have the most beautiful colours, both of the plain and variegated kinds, should, when in full bloom, be marked, from which to save seed: if any ordinary sorts grow near them, let them be removed to prevent an admixture or emission of the effluvia or male-powder in the flowers of the chosen sorts, which might occasion a great variation; for by observing this, you may continue some of the varieties tolerably permanent.

Let the branches of seed be gathered in dry weather, and after lying a few days in the sun to dry and harden, beat out the seed, and put it up in papers, &c. till spring, for sowing.

DIBBLE or DIBBER. A simple but useful implement of gardening, used for planting out all sorts of young plants, &c.

The best sort of Dibble is that made of the tree of an old spade, having the head or top handle entire, and the Shank twelve or fifteen inches long, made gradually tapering to a point at the lower end, and which, to be perfectly complete, should be shod with a thin socket of iron eight or ten inches in length, made also tapering to a point at bottom; for an iron-shod dibble makes the holes for the reception of plants much easier, cleaner, without clogging, and more expeditiously,

than entirely of wood, which is apt to clog with earth, and greatly retard the work of planting.

The above sort of Dibble is proper for planting out almost all sorts of young plants, particularly the fibrous-rooted kinds, and all sorts of cuttings, &c.

But besides the above kind of narrow-pointed Dibble, for planting out young plants, &c. I should also advise to have a blunt-pointed one for planting large kinds of seeds, and bulbous roots, such as broad beans, potatoes, large kinds of nuts, &c. and the bulbs of crocus, narcissus, tulips, and other bulbous kinds, that by being rounded at the end, makes a hole to receive the above sorts of large seed and roots plump to the bottom; whereas the narrow-pointed Dibble makes the hole deeper than it is capable of admitting them, so that there will be a vacancy under the seed or root, in which water might stand to their prejudice, especially in winter; besides, when the seed or root goes clean to the bottom, it is certainly more effectual to its free growth.

It may indeed be advanced, that the narrow-pointed Dibble will answer the same purpose, by striking a little earth into the hole to fill up the narrow part at bottom, previous to planting the seed or root: but this in a hurry may often be omitted, and takes up more time: but the blunt-ended Dibble makes the hole at once to admit the seed or root always plump to the bottom.

But as to planting bulbous roots by Dibble, though often practised, yet if they are to be planted together in beds, I would rather advise drilling them in, that is, draw drills three or four inches deep with an hoe, so place the roots plump bottom downward in the drills, and earth them over. See the respective articles of HYACINTH, NARCISSUS, DRILL-PLANTING, &c.

For planting potatoes, a particular sort of Dibble is generally appropriated to this occasion: for large quantities, in fields particularly, is long and thick; being commonly two feet and half, or near a yard long, two inches thick at least, blunty at the lower end, and shod with iron, and with a cross handle at top, to hold with both hands; and generally near the bottom is a sort of shoulder of iron about six inches from the end, projecting at one or both sides, ranged parallel to the cross handle at top, and serves both as a guide in making the holes all of an equal depth, and occasionally as a tread for the foot, on thrusting it into the ground; in using which, one man proceeding therewith as hole-striker, taking hold

above

above with both hands, strikes it into the ground, forming the holes; another, or generally a boy, follows immediately after, and drops the potato sets, one in each hole; which are afterwards covered in by harrowing the ground, or in gardens, by raking.

DICTAMNUS, White Dittany, or *Fraxinella*.

It consists of one hardy, herbaceous, flowery perennial, rising two or three feet high, crowned by spikes of pentapetalous flowers.

Class and order, *Decandria Monogynia*.

Characters.] **CALYX**, five small, oblong, pointed leaves. **COROLLA**, five irregular petals. **STAMINA**, ten rising filaments, and four-cornered antheræ. **PISTILLUM**, a pentagonous germen, short incurved style, and acute stigma. **PERICARPIUM**, a quinquelocular, bivalvular capsule, and roundish hard seeds.

The species is,

1. **DICTAMNUS** *albus*.

White Dittany, commonly called Fraxinella.]

Dictamnus, with thick, penetrating, perennial roots, collected into a head at top, sending up erect stalks annually two or three feet high, garnished with pinnated alternate leaves, of three or four pair of oblong, stiff lobes, terminated by an odd one, and the stalks crowned by long, pyramidal, loose spikes of flowers.

Varieties of this are,] With white flowers—with red flowers, striped with purple—with short spikes of flowers.

The flowers of all the varieties have five unequal petals, i. e. two of them turning upward, two oblique on the sides, and one turning downward, appearing in the latter end of May, and in June, succeeded by ripe seeds in September.

They are very ornamental garden flowers, so merit a place in every collection of flowery perennials; and they succeed in any of the common borders.

The whole plant imparts a balsamic odour, when bruised, and the roots are used in medicine.

All the varieties are propagated by seeds, in a bed or border of common earth, sown in autumn or spring; but the autumn sowing, i. e. in September or October, generally rise strong the spring following, which in autumn after, when the leaves decay, should be planted in a bed or border six inches apart, to remain a year or two, then transplanted into the flower-borders, where they will flower the succeeding summer, and will endure many years, increase exceedingly in magnitude, and flower every year stronger.

All the necessary culture is, to cut down the decayed stalks every autumn, dig the ground in winter or spring, and keep them clean from weeds in summer.

DIGGING.—Digging ground may be considered as a sort of garden-tillage, or necessary preparation of the soil for the reception of all sorts of seeds and plants, and which should be duly performed annually, either in autumn, winter, or spring, particularly for every new crop, and is also beneficial to crops of perennial standing, whether esculent plants, flowers, or shrubs, &c.

This operation is performed two different ways—Plain digging,—and digging by trenches, commonly called trenching.

Plain Digging.—Forming a level surface, is generally practised when the ground is intended for immediate sowing or planting; beginning at one end of any piece of ground, bed, or border, and dig it one spade deep, right back spit and spit regularly to the place where you finish; the method is this: begin as aforesaid at one end of the piece of ground you intend to dig, and with your spade open a trench quite a-crois, one good spade wide, and one deep, carrying the earth to the end or place where you finish; then keeping your face to the opening, proceed to digging one spade deep regularly from one side of the piece to the other, turning the spits neatly into the trench, and the next course against these, and so keep digging straight back, spit and spit, still preserving a clear open trench, a good spade width and depth, between the dug and undug ground, that you may have full room to give every spit a clean turn, taking all the spits somewhat perpendicularly, and not take too much before the spade, especially in stiff land, or where the surface is full of weeds, or is much dunged; so giving every spit a clean turn, the top plump to the bottom, and the bottom to the top, that the weeds or dung on the surface may be buried a due depth, and that the clean fresh earth may be turned up; though, in digging thickly-dunged ground, it is more eligible to pare or trim the dung spade and spade wide, into the bottom of the opening, digging the ground over it in the same regular manner.

As you proceed, break all large clods, and preserve an even surface, carrying both sides and middle on equally, unless one side shall be hollow; then carry on the hollow side first, in a kind of gradual sweep, inclining the spits of earth rather that way, which will gradually raise that side, and reduce the high one; observing the same if both sides are high and the middle hollow, or both sides hollow and the

the middle high, always keeping the lower ground advancing gradually before the higher, by which you will always maintain a uniform level, whether horizontal or declining.

The same should also be observed in beginning to dig any piece of ground, that if one corner is much lower than the other, carry on the lower part somewhat first, in a kind of easy sweep or slanting direction, as far as necessary; likewise in finishing any piece of digging, that if one corner shall be low and the other high, carry the digging gradually round upon the lower side, so as to finish at the highest corner; and having digged to the end, or that part of any piece of ground where you intend to finish, then use the earth digged out of the first trench to make good the last opening equal with the other ground.

In plain digging dunged ground, if the dung is quite rotten, you may either dig clean through, giving each spit a clean turn, to bury the dung plump in the bottom of the trench; but if you cannot readily do this, trim the dung a spade's width at a time into the furrow or open trench, and so dig the ground upon it, which is rather the most effectual method, whether rotten or long fresh dung.

In the course of digging, all root-weeds that are perennial should be carefully picked out, particularly couchgrasses, and bearbind (*Convolvulus sepium*); for the least bit of either will grow, increase greatly in summer, and prove most troublesome weeds.

But slight-rooting weeds, on the surface being turned clean to the bottom, will rot, and never trouble you again.

Digging by trenches, or trenching.—This is called trenching, because the ground is digged in regular trenches, trench and trench, of two spades width, and one, two, or more deep, in the following manner:

Begin at one end of the piece of ground, and open a trench by line and spade two full spades width, and one or two deep, and wheel the earth to the place where you shall finish, then mark out a second trench of the same width, pare all weeds on the surface into the bottom of the first, and then beginning at one end of the second, and standing side-ways to the open trench, dig it the full width and depth as above, turning the earth into the first trench; observing, that if you go two spades deep, dig the top spit along first, then beginning again at the end, dig the second course; then mark out a third trench, dig it into the second, and so proceed trench and trench to the end of the ground, remarking, that if you would have each course of spits in the several

trenches their full depth, it is proper to shovel up the crumbs or loose earth at the bottom of each course; so may dig either one spade deep and the crumbs, or two and crumbs, as shall seem necessary, but by no means go below the good soil; and one good full spade deep, with a good paring at top, is, for common trenching, sufficient for general crops of most sorts of plants; and more than that is only necessary on particular occasions, and for particular plants, which will always be hinted in the respective articles.

I would however observe, that by trenching occasionally two spades deep where the depth of fertile soil admits, by turning the bottom spit to the top, renews the soil; and by turning the exhausted or worn-out top earth to the bottom that depth for two or three years, gives it a sort of respite to recruit new vigour in its vegetative quality, that being again trenched up to the top will produce crops the more abundantly, and in greater perfection.

It is indeed eligible culture, when the good soil is of sufficient depth, to trench two moderate spades deep, with or without the crumbs, for carrots and parsneps, and such like roots which strike deep into the ground; and for liquorice, three spades deep is necessary, where practicable in respect to the depth of proper soil; for the roots, the useful part, often strike down four feet deep.

The merit of trenching, in general, is superior to plain digging for many principal crops, or any plantations, as, with the top soil, all weeds and dung are more effectually buried in the bottom, and the fresh soil below more readily turned to the top; which is of considerable importance in the growth of all seeds and plants; therefore in digging ground for any general kitchen-garden crops, or for plantations of young trees, &c. I should advise to dig it principally by trenches one good spade deep in general; or two occasionally, for particular purposes, such as when thought necessary to renew the soil, or as you shall judge proper for long-rooted esculents, as carrots, &c. or plantations of choice wall-fruit trees, &c.

In all trenching, whether one, two, or more spades deep, always, previous to digging, pare the top of each trench two or three inches deep, with all dung, weeds, and litter, into the bottom of the open one, which not only makes clean digging, and increases the depth of loose soil, but all weeds, as also the seeds of them that may have scattered on the surface are regularly buried at such a depth, that the weeds themselves will rot, and their seeds cannot vegetate.

In trenching dunged ground, if you trench but one spade deep, bury the dung of each trench regularly in the bottom; but if two spades deep, it will be eligible for common slight-rooting crops to bury the dung only one spade depth; that is, trimming back the dung, dig the first course, turning it into the bottom of the open trench, then trim in the dung upon that, and dig the second course and turn it in upon the dung, and so proceed trench by trench.

When intending to trench for spring crops, or even for any autumn or winter plantation, it is good culture to perform it some considerable time before, to lie fallow till the time for sowing or planting, to meliorate by the weather, but more particularly for spring crops, so that if it is trenched up in rough ridges in winter, to lie till spring, and then levelled down, which by further loosening, breaking, and pulverising the earth, proves very beneficial to plants of all sorts.

I would also advise, that all trenching in winter, intended for spring crops, be trenched up in rough ridges; that is, instead of forming a level surface, lay the earth of each trench in a sharp ridge longways, as you advance with the work, laying the spits of earth rough, that the soil may lie hollow to receive the greater benefit from the sun, air, and frost, to meliorate and enrich its quality; and even if the trenching is performed in the spring to be sown or planted soon after, if turned up in ridges, and to lie only a week or a few days, the levelling it down for sowing would be a good additional improvement in meliorating the ground,—and of particular advantage to most sowing crops.

The ridges are soon levelled down when the ground is wanted for sowing or planting, observing to chuse dry weather for this work, levelling them regularly ridge and ridge lengthways, stirring all the ground, and preserve an even surface; and if the ground is for sowing with small seeds, do not level down much more than you can sow the same day, for fear of rain coming to render the surface cloggy, or the sun and winds dry it too much, as most land is always in best order for sowing while it is fresh stirred; for it not only falls to pieces more readily in raking, to cover the seed more effectually, but fresh-stirred land promotes a quick and free germination in the seed.

But in trenching ground that is intended for immediate sowing or planting, or in a short time after, it may be digged in a level surface ready for these occasions; or where designed principally for planting, either with esculent crops, or with trees or shrubs, &c.

either directly or some time after, as may be convenient; it may also, if thought eligible, be trenched in a level order, in readiness for planting when wanted.

It, however, is of much utility in general, the trenching of ground in ridges, when intending it to lie fallow for some time, as by lying in that form it receives the greater benefit of the elements, as well as remains drier in winter, than if laid level; and, together with levelling down the ridges, it in the whole much improves its fertilising quality.

DIGITALIS, Fox Glove.

This genus furnishes hardy, herbaceous, tall, flowery biennials and perennials for the pleasure-ground, and a tender shrubby exotic for the green-house, all of them adorned with long, spear-shaped, simple leaves, and long spikes of large, tubulous, bell-shaped flowers.

Class and order, *Didynamia Angiospermia*.

Characters.] CALYX is five-parted and persistent. COROLLA is monopetalous, bell-shaped, tubular, and with the limb slightly four-parted, having the upper lip spreading and emarginated, and the under one largest. STAMINA, two long and two shorter filaments inserted into the base of the Corolla, and bipartite antheræ. PISTILLUM, an acuminate germen, simple style, and acute stigma. PERICARPIUM, an oval, bivalvular, bilocular capsule, and angular seeds.

There are about four herbaceous and one shrubby species, retained in our gardens as plants of ornament.

The first four are herbaceous and hardy.

1. DIGITALIS purpurea.

Purple Common Fox Glove.] Digitalis, with an upright strong stalk three or four feet high, garnished with long, rough, hairy leaves, and terminated by a long loose spike of large purple flowers ranged along one side, having oval leaves to the calyx, and obtuse corolla, with an entire upper lip.

Variety.] With white flowers.

2. DIGITALIS lutea.

Yellow Fox Glove.] Digitalis, with an upright strong stalk two or three feet high, garnished with long, spear-shaped, smooth leaves, and the upper part with a long spike of yellow flowers ranged along one side, having the leaves of the calyx spear-shaped, an acute corolla, and bifid upper lip.

Varieties are,] With small yellow flowers—with large yellow flowers—with narrow leaves and small yellow flowers.

3. DIGITALIS ferruginea.

Iron-coloured Fox Glove.] Digitalis, with an upright stalk five or six feet high, adorned with narrow leaves three inches long, and terminated

terminated by a very long erect spike of iron-coloured flowers, having oval leaves to the calyx, and the lower lip of the corolla very long, and bearded.

4. *DIGITALIS Thapsi.*

(*Thapsi*)—or *Purple Spanish Fox Glove.*]

Digitalis, with an upright stalk a foot and a half high, garnished with very long, woolly, rough, veined, decurrent leaves, and terminated by a short spike of purple flowers.

Shrubby and tender.

5. *DIGITALIS canariensis.*

Canary Shrubby Fox Glove.] *Digitalis*, with a shrubby, upright, branchy stalk rising five or six feet high, spear-shaped, rough leaves four or five inches long, and half as broad, and with all the branches terminated by loose spikes of flowers, having the calycinal leaves spear-shaped, and an acute two-lipped corolla.

The flowers of all these species of *Digitalis* are each of one tubulous-bell-shaped petal, moderately large, and mostly ranged along one side of the stalk, appearing in June, July, &c. conspicuous and ornamental.

Of these species the first sort grows wild in most parts of Britain, but all the others are of foreign growth. All the herbaceous kinds are hardy, and prosper any where, but the shrubby sort requires shelter of a green-house in winter.

The four herbaceous species are biennial and perennial; all of them rise first with a large tuft of leaves, crowning the root, and amidst them rise the stalks in spring, flower in June and July, ripen seeds in autumn, and the stalks and leaves soon after decay, and sometimes also the root, especially of the first sort, which is seldom more than biennial.

All the herbaceous species may be employed as plants of ornament in the embellishing the different compartments of the pleasure-ground, and will prosper in any common soil and exposure.

The shrubby sort claims a place among the green-house exotics, is a very pretty flowering plant, often continuing its bloom from May till October.

Propagation, &c.

The herbaceous sorts are raised from seed in the common ground, sown in autumn or spring, and some by bottom off-sets; but seed is commonly more successful; when the plants are come up three inches high, prick them out at six inches distance, to remain till autumn; then transplant them where they are to flower.

The shrubby sort is also raised from seed,

sown in pots of rich earth in autumn, &c. and placed in a garden-frame to have occasional protection from frost, excessive rains, and cold; and when the plants are two or three inches high, plant them separate in small pots, and afford them shelter during cold weather, and place them in the green-house in winter.

DIONÆA. Venus's fly-trap.

A low, perennial, herbaceous American plant, with succulent leaves and decandrious flowers growing in spikes.

Class and order, *Decandria Monogynia.*

Characters.] An erect five-leaved cup, with oblong, acute, persistent folioles. *COROLLA*, five blunt, concave, oblong, tessile petals. *STAMINA*, ten awl-shaped filaments, topped with roundish antheræ. *PISTILLUM*, a crenated, roundish, depressed germen, style slender, and crowned with a spreading stigma, with its border fringed. *PERICARPIUM*, a gibbous, one-celled capsule, containing many oval small seeds.

There is but one species.

DIONÆA muscipula.

Venus's fly-trap.] Hath a fibrous root, crowned by several oblong, broad, fleshy leaves, three or four inches long, having at the end of each leaf two lobes or lips, in the shape of eye-lids, an inch broad, with a row of stiff hairs on the margin of each lobe; the flowers come out on a spike from between the leaves, and are of a pure white colour.

This singular plant may be included among the sensitive tribe; for when the two lobes at the end of the leaf are undisturbed, they expand open, particularly in warm weather, but if they are the least touched by a straw, or any small insect, they immediately contract themselves and grasp it quite close; nor do they open till the insect is either squeezed to death, or remain imprisoned till it dies.

The *Dionæa* is propagated by seeds obtained from Carolina, where it is a native. Sow the seeds on a moderate hot-bed in pots of light moist earth, and when the plants are come up, let them be transplanted singly into a small, narrow, deep-bottomed pot, in a boggy kind of earth, keeping them watered and shaded till they have taken fresh root; the future management of the plants afterwards is, in summer, to keep them in a frame sloping from the sun, giving proper air; and in autumn, placed in the green-house, they requiring only to be protected from frosts, and having but moderate waterings in winter.

DIOSMA, African Spiræa.

This genus comprises several low shrubby exotics for the green-house, garnished with

small, entire leaves, and numerous small, quinquepetalous flowers.

Class and order, *Pentandria Monogynia*.

Characters.] CALYX is five-parted, plane at the base, and persistent. COROLLA, five oval, obtuse, erect petals, and a coronated quinquefid nectarium. STAMINA, five filaments, and oval, erect antheræ. PISTILLUM, a germen crowned by the nectarium, simple style, and obsolete stigma. PERICARPIUM, five united capsules, each having one oblong, depressed, smooth seed.

The species are,

1. *Diosma oppositifolia*.

Opposite-leaved Diosma.] Diosma, with a shrubby stem, branching irregularly three or four feet high, garnished with awl-shaped, acute leaves, placed opposite, and numerous small, white flowers all along the sides of the branches.

2. *Diosma hirsuta*.

Hairy Sweet-scented Diosma.] Diosma, with a shrubby stem, branching regularly five or six feet high, narrow hairy leaves, placed alternate, and clusters of white flowers at the ends of the branches.

3. *Diosma rubra*.

Red Flowering Diosma.] Diosma, with a shrubby stem, branching three feet high, narrow, acute, smooth leaves, keel-shaped underneath, and dotted beneath in two rows, and red flowers.

4. *Diosma ericoides*.

Heath-like Diosma.] Diosma, with a shrubby stem branching three or four feet high, narrow, spear-shaped leaves, convex underneath, and imbricated two ways.

5. *Diosma uniflora*.

One-flowered Diosma.] Diosma with a shrubby stem, rising two feet high, the leaves thickly set on the branches; these are small, and of an oval-oblong pointed figure: the flowers, which are single and terminate the branches, are each composed of five large, white, deciduous petals, with a streak of red running down the middle of each.

All these plants are natives of Africa, and require the shelter of a green-house here in winter. They are all very ornamental during their bloom, and most of them impart a fragrant odour, so are worthy of a place in every curious green-house collection.

Propagation, &c.

All the sorts are propagated plentifully by cuttings in spring or summer, planting them in pots, several in each, and plunge them in a hot-bed; they will be well rooted in two months, and may then be potted separately,

and managed afterwards as other green-house shrubs. See GREEN-HOUSE PLANTS.

DIOSPYROS. Date, Plum.

This genus furnishes two deciduous, very ornamental flowering-shrubs, hardy exotics from America, &c. of about eight or ten to fifteen or twenty feet growth, adorned with beautiful, oblong, bright-green foliage, and hermaphrodite, and male and female, reddish purple flowers, on two distinct plants, succeeded by large globular, baccaceous, eatable fruit.

Class and order, *Polygamia Diœcia*.

Characters.] *Hermaphrodite*—CALYX, monophyllous, obtuse, four-parted, permanent. COROLLA, large, monopetalous, pitcher-shaped, acutely four-parted, spreading-angled. STAMINA, eight short, setaceous filaments, with oblong antheræ. PISTILLUM, a roundish germen, simple, quadrifid style, longer than the stamina, and permanent and obtuse bifid stigma. PERICARPIUM, a large, globular berry, of eight cells, with a roundish hard seed in each cell.

Males on distinct plants.—CALYX, small, monophyllous, acute, and erect. COROLLA, three-cornered, pitcher-shaped, four-parted-revolute, coriaceous. STAMINA, eight short filaments, and long acute antheræ.

The principal species are,

Diospyros virginianus.

Virginia Date-Plum, commonly called Pishamin-Plum.] Diospyros, with a shrub-like stem, branching irregularly ten, twelve, or fourteen feet high, having brownish, smooth branches, garnished with largish, oblong, shining-green leaves, changing to a purplish colour towards autumn; and reddish flowers, succeeded by large, black, eatable fruit, of the berry kind.

Diospyros Lotus.

(False Lotus of Homer)—or European Date Plum.] Diospyros with an upright tree stem, dividing upward into a branchy head, growing ten to twenty feet high, the branches yellowish and smooth; garnished with oblong, pointed, bright green, alternate leaves, and reddish flowers, succeeded by baccaceous, eatable fruit.

These two species claim admittance in principal shrubbery compartments, to arrange in the deciduous collection: they are more particularly ornamental in their large, shining green leaves, forming a conspicuous contrast in assemblage with other shrub and tree kinds, whose leaves are of different shapes, sizes and tints; and the flowers, though of no striking beauty, form a variety, and are succeeded by fruit, which, when in a state of decay, like the medlar, is eatable.

They

They may be planted in shrubberies, &c. in the proper season of autumn or spring, in any common soil, in a somewhat defended situation.

Both the sorts are raised from seeds in the spring, either in a sheltered dry compartment in the full ground, or sown in a hot-bed, to forward them in a more certain and quicker growth; and on this consideration, they should be sown in pots, and placed in some moderate hot-bed under a frame, &c. just to bring up the plants, which inure to the open air by degrees in summer, and sheltered from frost a winter or two, then transplanted in the spring into a nursery, to remain till of proper growth for final transplantation into the shrubbery, or where intended.

DIRCA, Leatherwood.

A hardy, deciduous, American shrub, of low growth for the shrubbery, adorned with oval leaves, and monopetalous, bellied flowers.

Class and order, *Ostendria Monogynia*.

One species.

DIRCA palustris.

Marsh Virginia Leatherwood.] Grows with a low shrubby stem, and branchy head, garnished with oval, yellowish-green leaves, monopetalous, clavated, bellied flowers, containing eight stamina and one pistillum, and succeeded each by a single-seeded berry.

This shrub is eligible for the shrubbery in some moist situation, somewhat similar to its native soil; and may be propagated by seeds, and by layers and cuttings in the young wood, all principally in the spring.

DISANDRA. This genus consists of a trailing perennial plant, ornamented with kidney-shaped leaves, and wheel-shaped flowers.

Class and order, *Heptandria Monogynia*.

Characters.] CALYX, a seven-parted permanent cup. COROLLA, monopetalous and rotate, tube very short, and border divided in six ovate parts. STAMINA, seven setaceous, erect filaments, topped with arrow-shaped antheræ. PISTILLUM, an oval germen, style slender, crowned with a simple stigma. PERICARPIUM, an oval, bilocular capsule, containing many oval seeds.

We know but of one species, viz.

DISANDRA prostrata.

Trailing Disandra.] Hath trailing branches to a great extent; these are ornamented with crenate kidney-shaped leaves, about an inch and half wide; the flowers are placed on slender foot-stalks, several arising from each joint, and are of a bright yellow colour.

This plant flowers most of the summer months, and appears to the best advantage

when growing in a pot, placed high, so that its branches may hang loosely down.

Disandra must be kept in the green-house during the winter; in summer it will bear the open air: it is readily propagated by cuttings planted in rich earth and properly watered.

DODARTIA. This genus furnishes a hardy perennial plant, adorned with linear leaves, and labiated flowers.

Class and order, *Didynamia Angiospermia*.

Characters.] CALYX, a monophyllous, bell-shaped cup, indented at the brim. COROLLA, ringent and monopetalous, with a deflexed, cylindric tube, having a small upper lip, and a broader, spreading, trifid under one, doubly longer. STAMINA, four filaments, two of which are shorter, topped with small roundish antheræ. PISTILLUM, a roundish germen, awl-shaped style, crowned with an oblong compressed stigma. PERICARPIUM, a globose, two-celled capsule, containing many small seeds.

The species is,

DODARTIA orientalis.

Eastern Dodartia.] *Dodartia*, with smooth, linear, entire leaves. This plant hath a perennial creeping root, sending out firm, compressed stalks about a foot and a half high, with several side branches garnished with long, fleshy, narrow leaves; the flowers, which are tubulous and ringent, come out singly from the joints of the stalks, and are of a deep purple, but seldom produce seeds in this country; it propagates by its creeping roots without any trouble.

DODECATHEON, American Cowslip, formerly *Meadia*.

It furnishes one low, flowery perennial for the pleasure ground, adorned with umbellate clusters of monopetalous flowers.

Class and order, *Pentandria Monogynia*.

Characters.] CALYX, a many-leaved involucre, and each floret having a monophyllous, five-parted, permanent cup. COROLLA, many florets, forming a sort of umbel, each floret monopetalous, cut into five retroflexed segments. STAMINA, five short filaments, and arrow-pointed antheræ, connected into a beak. PISTILLUM, a conical germen, slender style, and obtuse stigma. PERICARPIUM, an oblong, oval, unilocular capsule, containing many small seeds.

The species is,

DODECATHEON Meadia.

(*Meadia*)—or *American Cowslip*, generally called *Meadia*.] *Dodecatheon*, with a yellow perennial root, crowned by several long smooth leaves, six inches long and two or three broad, and between them erect flower-stalks eight or

ten inches high, each terminated by an umbellate cluster of quinquefid, retroflexed, purple flowers. See the *Characters*.

This is a hardy perennial, flowers very ornamentally in May, ripens seed in July, and the stalks and leaves decay in autumn, so are renewed from the root annually in spring.

It will succeed in any of the common borders, but is the most prosperous in a somewhat shady situation.

Propagation.

Its propagation is by seed, and by off-sets of the roots.

By Seed.—Sow the seed in autumn, soon after they are ripe, or in the spring, in a shady border, or in pots, moving them to occasional shade in hot weather; the plants will come up in the spring, and when their leaves decay, plant them on a shady border, six or eight inches apart, to stand a year; then transplant them into shady flower-borders.

By Off-sets.—In August or September, when the leaves decay, is the properest time to remove the roots, and take off the slips for increase, planting them again directly, and each off-set will flower the following summer.

DORONICUM, Leopard's-Bane.

The plants are hardy, herbaceous perennials, for the large departments of the pleasure-ground, they obtaining from eighteen inches to three feet stature, terminated by large compound flowers.

Class and order, *Syngenesia Polygamia Superflua*.

Characters.] CALYX, compound radiated flower, having the general cup formed of a double series of long narrow leaves. COROLLA, many tubular hermaphrodite florets form the disk, and ligulated females the radius. STAMINA, five filaments, and cylindric antheræ. PISTILLUM, a germen, small style, and in the hermaphrodites an indented stigma, in the females two, which are reflexed. PERICARPIUM, none. SEMEN, a single, furrowed, downy seed under each floret.

The material species are,

1. **DORONICUM Pardalianches.**

Greatest Leopard's-Bane.] Doronicum, with thick, fleshy, knotty, penetrating roots, crowned by a cluster of heart-shaped hairy leaves on long foot-stalks, and amidst them upright channelled stalks, three feet high, garnished with a few amplexicaulous leaves, and each terminated by one large compound radiated yellow flower.

2. **DORONICUM plantaginicum.**

Plantain-leaved Leopard's-bane.] Doronicum with thick fleshy roots crowned by oval,

acute-pointed leaves; and between them upright stalks two feet high, and alternate branches, surmounted by large compound yellow flowers.

3. **DORONICUM Bellidiastrum.**

(Bellidiastrum) — or Wild-Daisy-leaved Leopard's-Bane.] Doronicum with short, hairy leaves, and upright, simple, naked stalks a foot high, terminated by one white and yellow flower.

Variety.] With broad leaves, taller stalks, and red and white flowers.

All these plants are hardy and perennial in root, but annual in stalk; which rise in spring, flower in May, ripen seeds in July, and decay to the root in autumn.

The flowers are universally compound and radiated. See the *Characters*.

These plants may be employed in the large departments of the pleasure-ground, where many plants of easy culture are required to increase the variety; for they will grow anywhere, and where the seeds scatter, many young plants will rise naturally.

Propagation.

They are easily propagated by seed, and by their spreading roots; either of which may be performed in autumn or spring.

Sow the seed on the surface, and rake it in, and when the plants are two or three inches high, prick them in beds nine inches distance, which transplant in autumn where they are to remain.

Off-sets of the roots, taken off in autumn or early in spring, will flower in May following.

DRACÆNA. Dragon-tree.

A genus of exotic tree-like and herbaceous plants, with lanceolate leaves and bell-shaped flowers.

Class and order, *Hexandria Monogynia*.

Characters.] CALYX, none. COROLLA, six oblong, erect, equal petals, joining at their base. STAMINA, six awl-shaped filaments, topped with oblong, incumbent antheræ. PISTILLUM, an oval, six-streaked germen, slender style, crowned with a trifid, obtuse stigma. PERICARPIUM, an ovate, six-furrowed berry, with three cells, containing in each an oval, oblong seed, incurved at the top.

The species are,

1. **DRACÆNA Draco.**

The Dragon-tree.] Dracæna with a large, single, or unbranching stem, rising twelve or fourteen feet high, the top crowned with a cluster of sword-shaped, fleshy, pointed leaves, a yard or more in length, placed singly without foot-stalks round the stem, hanging down

down in a singular manner, but rarely flowering in England.

2. *DRACÆNA ferrea*.

Purple Dracæna.] Shrubby *Dracæna* with pointed, spear-shaped leaves, of a dusky-red colour, and spikes of reddish-purple flowers.

3. *DRACÆNA marginata*.

Marginate - prickly - leaved Dracæna.] Shrubby *Dracæna* with purple spinous leaves, axillary racemi, and many-seeded berries.

4. *DRACÆNA ensifolia*.

Sword-leaved Dracæna.] Herbaceous, and almost stalkless *Dracæna*, with sword-shaped leaves.

5. *DRACÆNA borealis*.

Northern, Oval-leaved Dracæna.] Herbaceous, subcaulescent *Dracæna*, with elliptical, furrowed, pointed leaves, and spreading flowers.

The first species is a stove exotic, and retained as a plant of singular growth and appearance: from this plant flows, by incision, a red gummy juice, of medicinal property, commonly called dragon's blood.

The second and third species flower in this country, as do also the herbaceous kinds. These, with the first, are propagated by seeds sown in pots of earth, and plunged in the bark-bed; the plants will soon come up, and when three inches high, may be transplanted into separate pots, continuing them always in the stove.

The fourth and fifth species are propagated in the same manner; but the fifth, being hardy, will bear the open air in this climate.

DRACOCEPHALUM, Dragon's head.

It consists of herbaceous perennials and annuals for the pleasure-ground and greenhouse, rising with upright stalks, from about eighteen inches to three feet high, garnished mostly with entire leaves, and whorled spikes of small monopetalous, ringent flowers.

Class and order, *Didynamia Gymnospermia*.

Characters.] *CALYX* is monophyllous, tubular, and permanent. *COROLLA* is monopetalous and ringent, with large inflated chaps, having an obtuse arched upper lip, and the lower one trifold. *STAMINA*, two long and two short filaments, and heart-shaped antheræ. *PISTILLUM*, a four-parted germen, slender style, and bifid, reflexed stigma. *PERICARPium*, none. *SEMEN*, four naked seeds lodged in the calyx.

The principal species are,

1. *DRACOCEPHALUM virginianum*.

Virginian Perennial Dracocephalum.] *Dracocephalum* with upright, four-cornered stalks a yard high, adorned with spear-shaped, sawed leaves, opposite at each joint; and terminated by erect spikes of purple flowers in July and August.

2. *DRACOCEPHALUM, Ruyschiana*.

(Ruyschiana)—or *Hyssop-leaved perennial Dragon's-head.*] *Dracocephalum* with an upright square stalk two feet high, garnished with very narrow, smooth, entire leaves; and terminated by whorled spikes of large blue flowers, having small bractæ under each whorl; it flowers in June, and the seeds ripen in autumn.

3. *DRACOCEPHALUM Moldavica*.

(Moldavica),—*Annual Dracocephalum, or Moldavian Balm.*] *Dracocephalum* with upright branchy stalks a foot and half high, garnished with oblong, deeply-sawed leaves, and terminated by whorled spikes of blue flowers; and the whole plant emits a very balsamic fragrance.

Variety.] With white flowers.

Both the varieties flower in July, and the seed ripens in September.

DRACOCEPHALUM canariense.

Canary sweet-scented perennial Dracocephalum, commonly called Balm of Gilead] *Dracocephalum* with upright, square, perennial stalks three or four feet high, garnished with compound leaves of three or five sawed lobes, and short spikes of pale blue flowers, appearing most part of summer; and the whole plant emits a strong balsamic odour.

The first three species are hardy, the first two of which are perennial, but the third is annual; all of them may be employed as ornamental flowering plants, they continuing their flowers in long succession, which, though separately small, being numerous together in their spikes, appear very conspicuous and pretty; and the annual sort imparting a sweet scent both in its foliage and flowers, merits a place in all collections of hardy annuals; so that the whole may be disposed to good advantage in forming variety in the decoration of principal flower borders, and other similar compartments in pleasure grounds; as they will prosper in any common soil, and are of hardy growth.

The fifth sort, *Balm of Gilead*, is esteemed principally for the balsamic fragrance of its leaves; the plant is somewhat tender, requiring shelter of a greenhouse or garden-frame in winter, by which care it will retain its stalk and leaves the year round, so may be considered as an herbaceous evergreen; it will however sometimes live in the full ground in a warm dry border, in mild winters; but this is not always to be depended on; therefore should keep them principally in pots, to move to occasional shelter in winter; but they only want protection from frost.

Propa-

Propagation.

The first sort may be raised from seed, and by parting the roots; but it propagates plentifully by the latter method, which may be performed in autumn, or early in spring.

The second sort is raised plentifully from seed sown in a bed of light earth in April; and when the plants are two or three inches high, prick them out at six inches distance, giving occasional water, and shade from the sun, till rooted, so to remain here till October; then transplant them with balls into the borders, and other compartments of the pleasure-ground, observing, that it is proper to raise some fresh plants every two years, to succeed the old ones.

The third sort and variety, being annual, are raised every year from seed, sown in spring in small patches in different parts of the borders where the plants are to remain to flower. See **HARDY ANNUALS**.

The fourth sort is propagated easily by seed and by cuttings.

By seed.—It may be sown in autumn or spring: the autumn sowing will sometimes rise the same season; or if not, being sheltered in winter, they will rise early in spring, and be forwarder than the spring sowings; the spring, however, is the more eligible season, March or April; sowing the seed either in a warm border, or rather in pots of light rich earth a quarter of an inch deep, and sheltered in a frame or glass-case, or under a hand-glass, occasionally in cold weather; and when the plants are two inches high, transplant them into separate small pots.

Or it may be brought forwarder by sowing in pots, placed in any moderate hot-bed; and, when the plants come up, inure them to the free air.

By cuttings.—Cuttings of the stalks and branches about five or six inches long, planted any time in summer, either in a shady border, or plant several in large pots, moving them to occasional shade, and give waterings in dry weather; they will readily take root, and towards autumn may be planted in separate pots.

DRACONTIUM, Dragon.

A climbing, evergreen exotic for the stove, garnished with pierced leaves and spathaceous flowers.

Class and order, *Gynandria Heptandria*.

Characters.] **CALYX**, a large, leathery, boat-shaped, one-valved spatha, protruding a single, cylindric, very short spadix, or club, covered with the fructifications, collected in a head. **COROLLA**, pentapetalous and concave. **STAMINA**, seven linear, depressed filaments,

topped with oblong, quadrangular, twin antheræ. **PISTILLUM**, an oval germen, a straight round style, and three-cornered, obsolete stigma. **PERICARPIUM**, a single roundish berry, containing many seeds.

Of this genus there are eight species; but they have very little beauty to recommend them, excepting one sort, which is—

DRACONTIUM pertusum.

Perforated Dragon.] Hath shrubby, long, flexible, rooting stalks, climbing upon support twenty or thirty feet, emitting roots at every joint, which strike in trees, walls, &c. as they ascend; garnished with leaves on long foot-stalks, and perforated with oblong holes: the flowers come out at the ends of the stalks; they are of a whitish yellow, and each succeeded by a roundish berry.

The chief merit of this plant is the singularity of the holes in the leaves; and being evergreen, it is very suitable for covering the bareness of the walls of the stove, and placed conveniently near for that purpose.

The propagation is easily effected by cuttings, planted in pots, and plunged in the bark-bed, where they will soon take root, and afterward transplanted singly into pots, with poor earth, to check their rambling growth.

DRAWING-FRAME, in gardening, is either a sort of deep hot-bed frame, or a kind of fixed glass-case, in which to place particular sorts of curious, tender, annual flower plants, in order, by the assistance of a hot-bed, for drawing them to a tall stature, such as cock's combs, tricolors, &c.

For this purpose, different sorts of frames are occasionally adopted; some made similar in form to a common hot-bed frame, but four or five feet deep, either movable or fixed; others are constructed of different divisions to place one upon another; and some are more capacious and effectual, being a fixed erection of glass-work, or, more properly, a glass-case; and is generally more commodiously adapted for this business than the two first-mentioned; though, as the two former are sometimes more conveniently attainable for this occasion in common practice, it may be proper to remark, that by their assistance, and that of a hot-bed, the plants may be drawn to a handsome size and stature of growth, but generally in some superior degree in the glass-case frame.

However, shall just observe, in general, that, although this business of drawing the above particular species of annuals to a tall growth is not so generally practised as formerly, it being still in much estimation in many places, it was thought eligible to give some general intimations of the construction, dimensions, and

and utility of the different sorts of Drawing-frames proper for this occasion.

The more common Drawing-frames are, as before hinted, either of one whole construction, three to four or five feet deep, or more, in the back-part, moderately sloping at both ends, at top, to a proportionable depth in front; or composed of two or three separate divisions, all of equal width and length, &c. to place one upon another occasionally, according as the plants contained therein advance in height; one of which divisions, being furnished with top glass-lights, is always placed uppermost; and when thus placed, they together form one frame, as it were, the above depth, and may be properly called a multiplying Drawing-frame.

These frames, in either of the above descriptions, are constructed wholly of wood, inch and half deal, and, in dimensions, are generally the width and length of common, large hot-bed frames, for two or three top-lights, according to the quantity of plants as may be intended to place therein for drawing.

When designed to have one constructed entire, it may either be movable or fixed, made in the form of a common, large hot-bed frame aforesaid, generally about four feet deep, or but little more, especially if intended for a movable-frame; but, if fixed, it may be wider and longer, if thought expedient, and five or six feet deep; and in either of which having the back-part a foot higher than the front, for the movable top-glasses to have a proper slope; and if the front and ends are constructed with upright glasses, with one or two sliding pannels, whereby to admit a larger portion of light and fresh air, it would be of greater advantage for the benefit of the plants, in having them advance with strong stems, well furnished with their proper leaves in full growth, as well as the flowers in full perfection; and it would also be convenient to have one or two sliding pannels in the wood-work, in the back part of the frame, both for the occasional admission of fresh air and the convenience of watering; and in regard to using this kind of frame, the plants being previously raised in a hot-bed under a common frame, pricked or planted in proper pots, and continued in the said frame till they advance in height to the glasses, when a fresh hot-bed being made for the Drawing-frame, the plants are then placed therein, to complete their growth, as hereafter more fully mentioned.

The multiplying Drawing-frame is, as before observed, composed of two or three separate movable frames, of equal width and length, made to fit exactly, to place one upon another, as occasion requires, so as when thus

placed, they together form one deep frame, answering the same purpose as the entire frame before described; and proves convenient, by admitting of augmenting the depth by degrees, according to the advancing growth of the plants; one of the divisions being constructed in the manner of a common frame, highest at the back, sloping gently to the front, and is to contain the sliding-glasses, or lights; and this being placed first on the hot-bed, till the plants reach the glasses, then being removed, one of the other divisions added in its place, is then placed upon that, as this must always be uppermost, being furnished with the glass-lights; the other divisions are each formed of an equal depth, in the back, the front, and ends, one foot to fifteen or eighteen inches, without having any distinct top-glasses; those of the principal frame, which, being always placed uppermost, serves for the whole; and, if the front divisions are glazed, and have some movable glass-pannels, it would tend to the same beneficial advantages as intimated of the entire frame; or, at least, may have thin wooden pannels to slide open for that necessary occasion.

The principal utility of the above-described Drawing-frames, in both the sorts, is mostly in the culture of some curious sorts of annual-flower plants, as before suggested, when intended to have them drawn up to a tall strong growth, which was formerly rather more in general practice than at present, especially for the large cock's-combs, *amaranthus tricolor*, and *bicolor*, globe-*amaranthus*, double *stramonium*, egg-plant, *balsamines*, &c. (see *Annual Plants*), some of which, by the assistance of the Drawing-frames, were often run up five or six feet high, or more, especially the large or giant cock's-combs, and tricolors, and the former with exceeding large crested flower-heads; though those, in general, of the above annuals as are drawn three or four to five feet high, according to the nature of growth of the different sorts, are very agreeable sizes of stature, having proportionable strength.

Respecting the method of using these frames for the above occasion, the plants being first raised in a hot-bed in the spring under common frames and lights, pricked or planted singly into proper-sized pots, in the same or another hot-bed; and, when they have advanced a foot, or little more, in growth, to reach the glasses of the present common frame, a fresh hot-bed being made in readiness for the Drawing-frame, this placed thereon, and the bed earthed at top, within the said frame, either with any light dry earth, or with old tan; then the plants in their pots are to be removed

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herein, plunging them to their rims in the earth, &c. put on the glasses; and afterwards managed according to the general directions for the culture of *Tender Annuals*, under the head ANNUAL PLANTS.

As was before observed, a rather more commodious Drawing-frame is occasionally used in this business, being a fixed erection, in the manner of a glass-case exotic repository; constructed either with a brick-work back, and with the lower part of the front and ends raised a foot high, of the same materials, finished with timber-framing above; or formed wholly of wood-work, as may be thought eligible: in dimension, five or six to seven or eight feet width, five or ten to fifteen or twenty feet long, six or seven feet high behind, by five or six in the front, with sloping glass-lights at top, upright ones in front and both ends, all movable, to slide open; and with an internal oblong pit at bottom, almost the whole width and length, a little sunk, forming the whole, part below and part above the surface, two feet deep, in which to make a hot-bed: and in this fixed frame, or glass-case, the plants, after being raised to some little advanced growth, in the manner before intimated, are then removed, in their proper pots, and plunged in the hot-bed thereof, above mentioned; and they will here grow freely, generally in a stronger growth, and superior perfection.

This kind of Drawing-frame, or, rather, glass-case, is also useful on other occasions; and, particularly, as a winter repository for many sorts of tender or curious plants.

But, sometimes, in default of any or all the afore-mentioned Drawing-frames, a sort of temporary one is occasionally formed with one of the deepest common hot-bed frames, either by raising it at bottom upon props, according as the plants rise in height, or by fixing four posts, one at each corner of the hot-bed, four or five feet high, having inch-wide holes bored on the inside, six or eight inches above one another, in which to place short wooden or iron pegs, one for each post, and on which to place the frame when necessary to raise it less or more in proportion as the plants advance upward in growth; and, in either of these methods of raising the frame, the vacancy at bottom may be closed with boards, or more readily defended with garden mats, slightly nailed to the frame, one or two thick, as may be thought necessary for the protection of the plants, according to the temperature of the weather.

DRILL-SOWING, &c. In gardening, drills are straight narrow openings, formed in the earth with a hoe, from half an inch to five or six inches deep, for the reception of the seeds

and roots of certain plants, which succeed best by that mode of culture.

Many sorts of esculents succeed by this method; as, for example, all sorts of peas and kidney-beans should always be sown in drills; for the plants, by their nature of growth, require to be cultivated in rows, two or three feet distance, and which is more readily effected by Drill-sowing: and, likewise, the seed of these plants being rather large, by forming drills an inch or two deep for their reception, they are more conveniently sown, and covered regularly at a proper depth with the earth; and that the drills being in straight ranges two or three feet asunder, the plants consequently rise in rows that distance, whereby there is due room between the rows, to hoe the ground, to destroy weeds, and to loosen the soil, and draw it up occasionally on each side of the plants to strengthen them, and forward their growth; likewise when their produce is ready, their standing distant in drills allows room to go in between, to gather the crops without damaging the plants: broad-beans are also sometimes drilled in, though they are more commonly planted with a dibble; however, in drills two or three inches deep they may be planted to great exactness, and covered all an equal depth, allowing the drills three feet distance at least: asparagus plants are also planted more commodiously in drills six inches deep, than by any other method. Parsley, coriander, chervil, and all small salad-herbs, such as cresses, mustard, &c. should also be sown principally in drills half an inch deep, as in which the herbs are more easily cleaned from weeds, and more readily gathered for use. Spinach is also sometimes sown in shallow drills, but more especially when cultivated between rows of other plants, as that of broad-beans, early cabbages, &c. it, however, should be sown thin, otherwise the plants will draw each other weak; but I would rather advise the main crops of this plant to be sown principally broad-cast over the surface of the ground, and raked in, and the plants hoed out to four or five inches distance. Beet, having large seed, may be sown in drills, in order that they may be more effectually buried an equal depth. See the respective articles.

Many sorts of the larger seeds, nuts, &c. of trees, shrubs, and herbaceous plants, may also be sown in drills an inch or two deep, in proportion to their several sizes.

Bulbous and tuberous flower-roots are also planted with great facility and exactness in drills of proper width and depth; but these kind of roots are very commonly planted with a dibble; I should, however, rather recommend the

the drilling, especially for such that are to be cultivated in continued rows, or in beds, proportioning the width and depth of the drill to the size of the respective roots; as, for example, if for crocuses, snow-drops, winter aconites, anemones, ranunculuses, and the like, two or three inches wide and deep is sufficient; but for the larger kinds, such as hyacinths, narcissus, tulips, lilies, &c. from three or four to five or six inches depth is necessary, and from six to twelve inches between the rows; placing the roots bottom downward plump in the drills at the same distance, and draw the earth evenly over them; but for more particulars, see the respective articles.

With respect to the method of drawing or forming drills, this should generally be performed by hoe and line; that is, set a line as tight as possible, then with a common hoe held corner-ways, with the edge close to the line, draw the drill along accordingly, from half an inch to five or six deep, as the different sorts of seeds and roots shall require, as exhibited in the respective articles.

Though drills, for some particular small seeds, may be drawn with a small or middling hoe flat-ways, i. e. the edge downward, in a horizontal position, so as to make a broad flat-bottomed drill; thereby forming a wider level bottom, gives a larger space for the seeds, and to admit of having them more evenly sown all an equal depth; and may be practised occasionally for some slight crops, as spinach, small-sallading, &c. and others, both of esculents, and flowers, for transplantation.

But for seeds of tender plants, which may require the aid of hot-beds, and if thought necessary to sow them in drills, as a hoe cannot be introduced, the ends of the two first fingers, or that of a short flat stick an inch or two broad, will form a proper drill.

As soon as the seeds or roots of any sort are sown or planted in drills, draw the earth over them evenly, either with a hoe or rake, or with the hand for the very small or more delicate sorts; though for the large kinds, such as peas, kidney-beans, broad-beans, &c. may turn the earth in upon them expeditiously with the feet alternately, being careful to cover all an equal depth, and trim the top of each drill clear from stones and clods, so as to leave a smooth surface.

DUNGS. In gardening, there are two admirable properties in Dungs, viz.

The one is to repair the decays of worn-out or exhausted soils, and to meliorate and fatten the earth, and render it fertile: the other is to produce a certain degree of heat when formed into hot-beds; which, in some measure,

supplies the office performed by the heat of the summer's sun, by producing crops of choice plants, fruits, and flowers in winter, or early in spring, that could not be obtained in the natural ground before summer; the former of which properties (as manure) is effected both by new and old or rotten Dungs; and that of various sorts; but the latter property (for hot-beds) is only to be found in one particular sort, i. e. horse-dung, including the wet litter and Dung together, as it comes from the stables, and while it is newly made, or before it rots and loses its heat.

Dungs for Manure.—Various sorts are recommended and used, according to the qualities of the soil they are designed to restore, meliorate, and enrich.

As, for example; some lands are very moist, heavy, stubborn, and cold; to improve which, some Dungs are of a hot light quality, as that of horses, sheep, and pigeons, &c. though, for gardens, horse or stable Dung, tolerably rotted, either alone, or mixed with light materials, is the best of all to use in any considerable quantity for such land: on the other hand, some ground is light, dry, and hot, and requires moist, fat, and cooling Dungs, as that of oxen, cows, hogs, &c. to render the soil fatter, and more compact to retain its virtue. However, a mixture of all these, i. e. horse, and neat or cow Dung, &c. tolerably rotted, will suit almost every sort of soil; or either of them alone, especially if thoroughly rotten, will prove beneficial to most kinds of garden land.

Horse Dung, however, is certainly the best improvement for cold land that can be procured, and may be used successfully both new and rotten; not, however, used new or strawy for carrots, parsneps, or other esculent roots of similar growth, but for any other above-ground crops; new horse Dung, just as it comes from the stable, may be used to much advantage in cold moist land, which in such soils frequently succeeds better than that which is quite rotten, as that of old hot-beds, or of the like nature.

We may also consider horse Dung the most useful of any for gardens, and is the most common Dung used as garden manure in many places, especially after having rotted in dung-hills, or having been previously used for hot-beds in winter and spring, for early and tender crops; which crops being all gone by autumn, or winter following, when the Dung of the hot-bed will have become rotten and buttery, and is then carried off as manure, into the different compartments of the garden, &c. and when thus rotted, is beneficial for all sorts of soils, and is very enriching.

And as to cow or oxen Dung, although it is particularly beneficial in light, loose soils, yet, when well rotted, it will also prove good manure for any; and with this and horse or stable Dung, as also hog-sty Dung together, mixed, makes an excellent manure for most sorts of land.

Hogs' Dung being very fat, is by some recommended as the most beneficial of all sorts of Dungs, and, when well rotted, has often proved excellent for fruit-trees, in a light soil, especially for apples and pears, but when thoroughly rotted, may be used to advantage for all sorts in light dry land.

Sheep and deer Dung have been found great improvers of cold clayey land.

The Dung of pigeons and other poultry being hot and full of salts, is found good for cold, wet, clayey lands: but before using, it would be an advantage, if exposed abroad in the dung-hill some considerable time to rot, sweeten, and to mollify the fiery heat natural to those Dungs; and if then mixed with light earth, sand, or ashes, to keep it from clinging, and then, after having lain six, eight, or twelve months, strew it over the ground in autumn or winter in moderate quantities, being dug or ploughed in lightly, it will tend much to facilitate vegetation in cold, heavy soils.

Human ordure, mixed with other Dungs and earths by way of compost, and exposed to the air some time, will prove beneficial to cold, sour, stubborn land.

For other sorts of Dungs, &c. used as manure, see MANURE.

All Dungs, used as manure, should be applied principally either in autumn, winter, or spring; and if it is horse or neats' Dung or a mixture of both, or of hogs' Dung, or the like, it should be laid at least about three inches thick all over the surface; but on poor land, if double that thickness, it will prove the more beneficial to the ground; but the hot fiery Dung of poultry should be used more sparingly, and that only to cold, heavy land.

In digging or trenching dunged ground, the Dung should be buried one spade, not generally more, so that if you trench two spades deep, generally, for common annual crops, always bury the Dung betwixt the first and second spit.

Dungs for hot-beds.—Horse-stable Dung, together with the wet litter of the stalls, is the only sort capable of producing the degree of heat requisite for hot-beds, but which property is found only in that which is newly made, or at least that has not lain so long on the dung-hill as to begin to rot considerably, and has quite expended its heat. Preparatory to forming this dung into hot-beds, the necessary

quantity should be cast up in a heap, shaking and mixing the long and short well together; and here it should remain a week, twelve days, or a fortnight, according to its quality and quantity, in order to prepare all the parts to an equal temperature of proper heat; observing, if the Dung is new and strawy, it will require to lie longer than older or short Dung; and if the heap is turned over once or twice, the rank, unwholesome steam, and burning quality, will evaporate more effectually. See HOT-BEDS, &c. &c.

DWARF-TREES. These are fruit-trees grafted near the root, that they may form heads not more than from about five or six to eight or ten feet high.

Under this head may be considered not only Dwarf-standards, but also all sorts of Dwarfs for espaliers, and walls, which are also grafted or budded low, to provide branches near the ground, so as to cover every part of the espalier or wall, from the bottom upward, most of which sort of Dwarf-trees are grafted or budded upon Dwarf-stocks, or such as are but moderate shooters, particularly for Dwarf-standards, to preserve them as dwarfish as possible; see STOCKS. And in which, the graft or buds are inserted, within about six, eight, or twelve inches of the bottom; and the first shoots from the graft or bud are, in spring following, when a year old, headed down to five or six eyes, to force out lower shoots to form the first set of branches near the root, as a foundation for furnishing the upper part; and by shortening these also, as above, if necessary, a farther supply is produced, to give the tree its first regular form, whether as a Dwarf-standard, or for espaliers, or walls. But as in this article we shall only treat of Dwarf-standards, so, for the other sorts of Dwarfs, see ESPALIERS and WALL-TREES.

Dwarf-standards are formed at first as above, not trained fan-fashion like espaliers, or wall-trees, but promoted to branch out low every way into a circular head, without being trained to any kind of fence, and are therefore properly standards, though of dwarfish stature.

These were formerly in great estimation, and trained in several different ways or shapes, viz. 1. Concave Dwarfs, being trained concave or hollow in the middle, having all the branches ranged circularly around the stem in an ascending direction, so as to form the heart of the tree hollow or concave. 2. Convex or conical Dwarfs, being trained convex or full in the middle, so as to form a close conical head. 3. Horizontal Dwarfs, being trained horizontally, i. e. all the branches trained flat, or in a horizontal position, parallel to the surface

surface of the earth. 4. Spiral Dwarfs, having the branches trained spirally round stakes.

5. Natural Dwarfs, the branches permitted to advance mostly in a natural growth: in which different orders of Dwarf fruit-trees, the first four require peculiar modes of training and pruning, to preserve the requisite regular form; and the last mentioned requires less trouble in culture, and bears equally well and abundant.

It may be observed of these Dwarf-standard fruit-trees, that, although not so generally cultivated now as they were formerly, they, in their mode of growth and bearing, form an agreeable diversity, and may be introduced with much propriety in gardens of any extent; and of which the concave, conical, and natural Dwarfs are preferable for any general planting, or more generally the latter, as the trees require less trouble in their culture, though in this there is no great difference, and they all bear plentifully in a pleasing manner, according to their size of growth; as do also the horizontal and spiral Dwarfs, which, however, are only eligible principally by way of curiosity in their peculiar mode of training: though, in lieu of most of these Dwarf-standard kinds, the more general method of training Dwarf-trees in espaliers is adopted, which certainly are preferable, in some degree, being more conveniently trained, in regular order, in their peculiar way, and well adapted for plentiful bearing; however, a few trees of the Dwarf-standards, now under consideration, merit admittance in gardens of almost any extent, for variety, in which they will also bear fruit very agreeably, being disposed singly upon large borders contiguous to principal walks, and in other open spaces, both in kitchen-gardens and pleasure-grounds, &c.

They should be no where planted nearer together than fifteen or twenty feet, particularly the concave and horizontal Dwarfs.

The sorts of fruit-trees commonly used for Dwarf-standards are apples, pears, plums, cherries, and sometimes apricots and figs; but any sort of fruit-trees may be trained in that form, as one direction serves for all.

The method of forming them is as follows:—and first of the concave Dwarfs.

To have proper concave Dwarfs, it is necessary to graft them upon Dwarf-stocks, as before observed, that they may be moderate shooters, and be of as dwarfish stature as possible; as, for example, apples should be grafted upon paradise-stocks, and pears upon quince-stocks, &c. (see Stocks); and the graft or bud to be inserted within six or eight inches of the ground, so as the stem may not exceed a foot or fifteen inches in height, and

may form branches within that distance of the surface of the earth.

Having, therefore, grafted or budded them as above, observe, that the first shoots from the graft or bud are to be stopped or shortened in spring, when a year old, to about five or six inches in length, or to so many eyes or buds, from which to procure from four, at least, to six or eight stout lateral shoots, to give the tree its first regular formation. When these laterals are a year old, they should also be shortened, as above, whereby to promote a farther supply of proper shoots, which, after having one summer's growth, are to be trained gradually in an ascending direction, at equal distances all around, so as to form the heart of the tree into a regular concave or hollow; to assist which, some wide hoops must be placed within, supported by stakes; and as the branches advance in length, train them up to the hoops, suffering no branch to cross its neighbour, but train them all parallel to each other, six or eight inches distance, in an ascending position as aforesaid; afterwards train the whole at full length, and they will then form, all along their sides, short thick shoots scarce an inch long, called fruit-spurs, as hereafter mentioned.

As to their general pruning, observe, in the course of that operation, that after the tree is furnished with a proper quantity of branches to form its proper figure all around, as above-noticed, the shoots or branches are not afterwards to be shortened; or only occasionally, to preserve some uniformity: though, in the former mode of culture, when desirous to keep the trees quite dwarfish, not exceeding three or four feet growth, the upper terminal shoots were constantly shortened every year in the course of general pruning.

However, the shortening the shoots of these trees should be sparingly practised, particularly apples, pears, plums, and cherries; for shortening promotes a great superfluity of strong shoots, and prevents the branches from forming spurs or fruit-buds, i. e. short thick shoots half an inch or an inch long; for all these sort of trees above specified mostly produce their fruit upon spurs (see *Pyrus* and *Prunus*), which generally first form themselves towards the extremity of the shoots or branches; so that, by shortening, you cut away the parts where they would have first appeared, and, instead thereof, strong unnecessary wood will shoot forth, and greatly retard the tree in forming for bearing.

All strong shoots rising in the middle of the tree, that may interfere with the concavity, should be annually taken off close, either in the summer.

summer as they are produced, or in the winter pruning. Likewise, after the tree is formed and furnished with a proper quantity of branches all around at equal distances, all shoots arising from the sides of the said branches should be also displaced annually, unless any shall appear necessary to fill any present or apparent future vacancy, or to supply the place of any irregular or unfruitful branch.

Be careful, at each pruning, to observe if there is any appearance of a vacancy, or any very irregular, unfruitful, or declining, worn-out branch, or other improper wood that may want renewing; in which case, leave occasionally some well-placed young shoots towards the lower parts, training them up between the older branches to be coming on gradually to a bearing state, to supply the place of bad ones, or any accidental vacancy.

Observe also, at each pruning, to preserve with the utmost care all the fruit-spurs before described; for it is from these only we are to expect the fruit; which will be evident by observation; but if any of these are become very long, disorderly, or unfruitful, it is proper to prune and regulate them occasionally as you shall see necessary.

Convex or conical Dwarfs.--To form these, they must be grafted or budded low, as directed for the concave Dwarfs, and the first shoots to be also shortened in spring, when a year old, to procure a further supply of several stout lower shoots, to form the first course of branches at about a foot or fifteen inches from the ground; and that, instead of forming the heart of the tree concave, like the former kind of dwarf, train a centre-shoot up the middle for a stem, and suffer it to branch out at every twelve or fifteen inches as it advances in height, training each set of branches a little horizontally.

Thus the tree may be formed into several sets of branches, one above another, which should be so ordered by pruning, that the lowermost set be extended the widest, and the next set immediately above it be a little shorter, the next shorter than that, and so on to the uppermost set, whereby the tree will assume the intended conic form; afterwards observe nearly the same rules of general pruning, as laid down for the concave Dwarfs; they will produce plenty of fine fruit.

Horizontal Dwarfs.—These are grafted within about eighteen inches to two or three feet of the ground, and their first shoots shortened, as for the concave and conical Dwarfs, to promote a regular supply of branches at that distance from the bottom; which, when about a yard long, are to be

trained in a horizontal position, suffering no upright growth to advance in the middle, but train the whole perfectly flat or horizontal on every side of the stem, continuing them as they advance in length always in the same position, and thus they will spread themselves circularly each way, and produce abundance of fruit.

The same mode of pruning is to be here observed as directed for the concave Dwarfs, so that a repetition here would be superfluous.

Spiral Dwarf-trees—have their branches trained in a spiral direction, round stakes placed circularly; are grafted, or budded low, like the foregoing, and the first shoots pruned short in the same manner, to obtain a proper set of branches below; then having stakes placed circularly at a small distance round the stem, three to four or five feet high, the branches are trained around the stakes, in a spirally-ascending order, at regular distances, four or five inches asunder; and the interior parts or heart of the tree kept hollow, or open, by pruning out all interfering shoots; as likewise all superfluous, irregular, and unnecessary shoots arising from and between the principal trained branches; and such as advance therefrom in a fore-right or projecting growth; and in this order of training the branches, the trees have a curious appearance in their growth; generally extending the branches without much shortening; and they will obtain a good fruitful state, and their production of fruit will appear peculiarly agreeable in its growth.

Natural Dwarf-trees.—Such as, having obtained a proper set of branches, are suffered to grow mostly in their natural order. They are grafted, or budded low in the stock, like the other Dwarf kinds, or at one or two feet from the bottom; and the first shoots pruned short, to procure an eligible set of lower branches, of which, if any are ill-placed, or too crowded, cut them out accordingly, retaining as full a supply as possible of the best well-placed thereof, that stand in some regular order round the stem, to form the head; afterwards may be permitted mostly to advance upward in their natural growth, as before observed; or however, should not omit giving occasional necessary pruning, to preserve some moderate regularity, such as to cut out any very disorderly-growing, or cross-placed branches, and crowded shoots; and any branches becoming crowdedly thick, to prune them out in a thinning manner, to leave the remaining general branches at some regular distances; and it may also be proper sometimes to reduce to order any runaway, long rambler, &c. but otherwise, observing the
above

above regulations, let the general regular branches continue their growth nearly in their natural way, and they will form themselves into plentiful bearers.

In the different orders of Dwarf fruit-trees; some pruners, desirous of keeping the heads always quite low, so as after they have ad-

vanced to three or four feet growth, continue pruning down the extreme or terminal shoots every year; which however is apt to force them into a confused superfluity of useless wood, and greatly retards their bearing, and they never attain any tolerable fruitful state.

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EARTH.—Earth may be divided into three classes, sandy, loamy, and clayey.

A good garden Earth may be either of a blackish, hazelly, or chestnut-brown colour; neither too light, loose and sandy, nor partake too much of loam or clay, but is fattish, light, pliant, and easy to work at all seasons; and if three spades deep, it will be still more beneficial for the purpose; though if there be eighteen inches or two feet depth of good staple, it will do for most sorts of esculent plants, and others, as well as for almost all sorts of fruit trees.

Sandy Earth.—All the light, loose, open, and gravelly soils, whether black, grey, hazelly, or yellowish coloured, till the loam or clay is come at, may be deemed of the sandy kind, and are capable of raising some certain plants; but having a mixture of loam or clay, and enriched with dung, it will produce all sorts; for a vegetable planted either in sand alone, or in a fat coherent glebe or Earth alone, receives scarce any growth; but where there is a just mixture of both, the mass becomes fertile.

By means of sand or sandy Earth, strong loam or clay is fertilised, the Earth being thereby rendered porous, and interstices or space maintained, by which the juices are prepared, and thrown off into the roots of the plants, and the fibres find room to extend themselves.

Sandy or gravelly ground easily admits both of heat and moisture, and is apt to push seeds and plants much earlier in spring than strong loamy or clayey soils.

But sandy land is liable to these incon-

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veniences, that being sometimes very light, infertile, and open, it either does not retain a due portion of moisture, or sometimes retains it too long, especially where there is clay at bottom; so, in these cases, is apt either to parch or chill too much.

Loamy Earth.—This is that sort of Earth which is a mixture of clay and sand, commonly of a yellowish or hazelly colour, and of a soft, fat, and slippery temperament, not so close a texture as clay, nor too loose and sandy, but of a middle nature between, and is at all times easy to dig and rake, and will readily dissolve by frost and rain.

But some distinguish a true loam, or brick-earth, as that which partakes more of clay than sand.

A good garden loam, however, should be such a just consistence as is pliable to work, and such as will not stick obstinately to the spade, rake, and fingers, &c. at every flath of rain, nor crust or chap in dry weather.

Loamy Earths, answering the above descriptions, are in many places the most common superficial or top Earth, going frequently one, two, or three spades deep, and is one of the most beneficial soils for almost all sorts of plants and trees. See COMPOSTS and LOAM.

Clayey Earth.—Clay is a strong, cold, heavy, moist Earth, liable to coalesce, and gather into a coherent and compact mass, having but little space or interstice; and Earth thus embodied, and, as it were, glued together, does not easily give out those salts contained in it, nor can the fibres of plants make their way through it in quest of proper nutriment; and therefore, such a soil, of itself, is no ways dis-

posed

posed to nourish vegetables; but if with such an Earth, some sharp, indissoluble sand, coal-ashes, or some other body of similar quality, and light hot dungs be added, and well intermixed by proper diggings, and breaking into small particles, they will keep the pores of the clay open, and render the whole loose and incompact, whereby the juices will have room to ascend, and the plants thereby receive proper nourishment.

All binding Earths, from the loam, till the stiffness of chalk may be come at, may be reckoned of the clayey kind, and require the aid of light Earths, ashes, and light dungs, to meliorate and warm them for the business of vegetation.

If the Earth of your garden is of a sandy, loose temperature, add loam and other heavy substances by degrees, and a good portion of moist rotten dung, particularly the dung of oxen, cows, and hogs, and of old hot-beds, &c. but any good, moist, rotten dung, will improve this kind of soil.

And if your garden is strong, stubborn, loamy, or clayey, meliorate it by sand, and other light materials, of a fiery, sprightly nature, together with plenty of dry rotten dung.

Clay Earth proper is an article of particular utility in some principal occasions in gardening.

It is very essentially useful in the operation of grafting, to clay round the graft or cion and stock together, at the place of insertion, whereby to guard that part from the weather, both of rain, wind, sun, and free air, till the union of the graft with the stock is effected; and the proper clay for this purpose should be of the middling degree strong, rather inclining to the loamy kind; and, preparatory to using it, should be well beat, and worked to a tough, pliant texture. See GRAFTING.

And Clay is also of great use in the formation of any compartments of water, in gardens, parks, &c. in which the natural bottom is incapable of containing the proper supply of water required, and by covering the whole with an eligible coat of clay, is rendered tenable to the requisite body of water; but the Clay for this occasion should be of the strongest compact nature, of a pliable, tough kind, blue, black, or reddish, as can be the most readily obtained; and should generally be applied as fresh dug out of the clay-pits, laid spreadingly by degrees, well trod, beat, and rammed as close as possible, all an equal thickness, ten or twelve to fifteen or eighteen inches; and as soon as laid, either cover the whole with gravel, if intended, or let in the water, to preserve the Clay from opening or cracking

by the wind and sun. See BASONS, WATER, &c.

EBENUS, Ebony.

It consists of one shrubby exotic for the greenhouse; a curious, hoary, evergreen, flowering-shrub, of moderate growth.

Class and order, *Diadelphia Decandria*.

Characters.] CALYX is monophyllous, and five-parted at top. COROLLA is papilionaceous, the vexillum roundish and erect, the wings small and roundish, and short ascending keel. STAMINA, ten diadelphous filaments, and simple antheræ. PISTILLUM, an oblong germen, rising style, and simple stigma. PERICARPIUM, an oval pod, and kidney-shaped seed.

The species is,

EBENUS cretica.

Cretan Ebony.] Ebenus with a shrubby stem, branching three or four feet high, five-lobed, fingered, hoary leaves, and all the branches terminated by thick spikes of purple, papilionaceous flowers, in June and July, and sometimes ripe seeds in autumn.

It should be kept always in pots, to move to the green-house in winter.

It is propagated by seeds sown in autumn or spring, in pots of light earth, which should be placed in a frame during cold weather; and when the plants are two or three inches high, plant them in separate pots, and manage them as other exotics of like quality. See GREEN-HOUSE PLANTS.

ECHINOPS, commonly called 'globe thistle.

This genus furnishes some hardy, herbaceous perennials for the pleasure-ground, producing annual stalks, from two to four or five feet high, divided leaves, and terminated by globular heads of flowers.

Class and order, *Syngenesia Polygamia Sgregata*.

Characters.] CALYX, a polyphyllous, scaly, general cup, and the partial one of the florets is oblong, imbricated, and persistent. COROLLA, each floret monopetalous, funnel-shaped, five-parted at the top, and reflexed. STAMINA, five filaments and cylindric antheræ. PISTILLUM, an oblong germen, slender style, and double stigma. PERICARPIUM, none. SEMEN, one oval-oblong seed, lodged in the calyx.

The principal species are,

1. **ECHINOPS sphaerocephalus**.

Spherical-headed Echinops, or greater Globe-Thistle.] Echinops with perennial roots, upright annual stalks four or five feet high, garnished with long, sinuated-jagged, deeply-divided, spinous, woolly leaves, white underneath,

neath, and the stalks surmounted by blue flowers, collected into large, globular heads, in June and July.

Variety.] With white flowers.

2. ECHINOPS *Ritro*.

(*Ritro*)—or *Smaller Globe Thistle*.] Echinops with creeping, perennial roots, upright, strong, annual stalks two feet high; pinnated, divided, many-pointed, prickly leaves, smooth on the upper side, and the stalks and branches terminated by smallish globular heads of deep blue flowers.

Variety.] With white flowers.

These two perennials and varieties may be employed in large gardens to increase the variety; they will prosper in any soil: they are propagated abundantly by seed sown in autumn or spring, in any common earth, and raked in: the plants may be transplanted into the different compartments.

If the seed is suffered to scatter, many plants will rise naturally.

EDGINGS. These are ranges of very small, dwarfish, evergreen plants, as box, thrift, &c. closely planted along the edge of borders or beds, serving both for use and ornament.

Edgings are particularly necessary to the edges of such borders or beds as immediately verge walks or alleys of gravel, sand, shells, or other loose materials; and are useful to form and preserve a boundary distinction betwixt the borders and walks, and to preserve the earth of the borders from being forced out upon the walks or alleys, and the soil of the walks from the borders; both of which would otherwise be the case, less or more, every time of doing the necessary work, and at every hard shower of rain. Edgings are therefore particularly necessary in flower-gardens, and to the borders immediately verging principal walks, to maintain uniformity and neatness, and, considered as ornamental, that being evergreen, and if planted in a close neat range along the edge of the border, all of an equal width, not more than two inches broad, and one or two high, and always kept within the compass of about three inches in width and height, without gaps and irregularities, but all the way close, and even at sides and top, they have a pretty effect, whether box or thrift, &c. and as some sorts of plants proper to be employed for Edgings are of the flowery tribe, such as thrift, daisies, pinks, &c. they, besides the property of being evergreen, are very ornamental in their flowers, which, of each sort, are numerous, and continue six weeks or two months in great beauty.

But the best Edging in the world is the

dwarf shrubby box (*Buxus suffruticosus*), it being the most effectual, most easily kept in order, and the most durable; retains its leaves and full verdure at all seasons, prospers in all soils and situations, is never hurt by any weather, and will endure many years, always close and regular, with the culture of shearing or clipping once or twice every summer at top and sides. See *Buxus*.

The next to box, for Edgings, is thrift (see *Statice*), which also grows very close, low, and in verdure all the year; and flowers beautifully two months in summer, but being rather apt to spread soon out of bounds, requires to be reduced, by cutting in considerably on each side, or by replanting it afresh every two or three years; and its general culture, as an Edging, is, to trim it a little with garden-shears on each side and top every summer, as soon as done flowering, cutting off also all the withered flower-stalks, performing it always in moist weather. See *STATICE*.

Daisies, pinks, chamomile, London-pride, catchfly, and several other low, herbaceous, evergreen, flowery perennials, are also sometimes employed for Edgings, which have a pretty effect when in flower; but as in one year they spread greatly out of compass as Edgings, should be taken up and replanted every spring or autumn, but more particularly the daisies; and the others, if they stand longer than one year, should be cut in on each side annually after flowering, to preserve uniformity.

Sometimes some sorts of dwarf bushy annuals are sown for summer Edgings in small gardens, such as the dwarf Virgin stock, heart's-ease, or *viola tricolor*, candy-tuft, and several other low, bushy, annual flowers; but the former of them is the most suitable for an Edging, as it grows low, bushy, and does not ramble, is very flowery, and continues long in bloom.

Several sorts of shrubby aromatics are also used for Edgings, as thyme, savory, hyssop, sage, lavender, and rue, all of which are evergreens, and may be kept low by close shearing; but then they become woody, stubbed, and naked; but these are also sometimes planted as Edgings in kitchen-gardens, for oeconomic purposes.

Parsley also forms a good evergreen Edging, for the edges of the quarters and borders of kitchen gardens; and if the true curled sort is sown, it will be very ornamental, as well as profitable.

Strawberries are also occasionally planted for Edgings to particular compartments; and if

the runners in summer are kept trimmed in close, the plants, as an Edging, will have an agreeable appearance when in blossom and fruit.

As to the method of planting or forming Edgings,—if box, the plants are generally planted in small, perpendicular trenches, placing them close together, so as at once to form a complete Edging (see *Buxus*). Thrift, daisies, pinks, &c. are commonly planted by dibble, at about two or three inches distance in the line, though, to form a compact Edging at once, they may be planted so close as to touch each other. Pink Edgings may also be formed by sowing the seed in a drill along the edge half an inch deep, so suffering the plants to remain. Annual flower Edgings are also formed in the same manner: thyme, savory, and hyssop Edgings may also either be formed by sowing the seed, or by plants or slips; sage and lavender, chiefly by planting young slips; and rue the same, or by seed.

All Edgings, the shrubby kinds in particular, should be neatly shorn or clipped with garden shears, at top and sides, every year in summer; and some sorts require it twice in that time, to preserve them perfectly neat, such as box, and most other shrubby kinds.

Never suffer box Edgings to exceed two or three inches in width, nor above three high; and thrift and the other herbaceous Edgings are not to get more than three or four inches wide.

Nor suffer the aromatic kinds, if in pleasure-grounds, to exceed five or six inches high, and three or four broad.

In clipping box Edgings, should generally clip the top along first, holding the shears level or horizontal, with the point forward, extending the way of the Edging, so cutting the top along before you in a level or even order, down to one, two, or three inches, according to its growth; but for a neat Edging, it should generally be kept down to about two or three inches high at most: and having cut the top, then, proceeding to the sides, holding the shears now with the point downward, cut in both sides regularly even and upright, to about an inch and half or two inches, but never exceeding three inches width at top; and that is rather too much in general: for a too high and broad Edging has a clumsy appearance, and makes the respective border or bed show low or hollow as it were; and besides, a large Edging affords harbour for slugs, snails, and other crawling insects, to the annoyance often of the adjacent tender plants, &c.

Other low Edgings in pleasure-grounds should be cut or kept in a somewhat similar

manner, as above in the box Edgings, even at top and sides, which, in those of the flowering kind, as thrift, daisies, pinks, &c. should generally be trimmed to regular order as soon as the flowers decay, cutting the decayed flower-stalks close down to the head of the plants which compose the Edging, and in which, at the same time, trim off any irregularities at top and sides, to remain even and neat for the remainder of the summer.

For particulars of the different sorts of plants here mentioned for Edgings, see their respective genera.

EDGING - IRON. An instrument in practical gardening for cutting even the solid edges of grass-plats, lawns, &c. sometimes necessary less or more every year in the spring.

This instrument, in the blade, is made somewhat in the crescent form, or like a large cheese-knife, &c. rounding below at the edge part, and with a socket above, upright in the middle, in which to fix a long straight handle of wood, three or four feet long; and thus formed is used occasionally to cut in the casual inequalities or irregular projecting parts of the solid edges of lawns, grass-plats, &c. especially those edges immediately verging principal gravel-walks, borders, and other conspicuous ornamental compartments in pleasure-grounds; and which is sometimes necessary in some degree every year, in the spring, to have the edges remain even and regular all summer, or at other times as there may be occasion.

This business is necessary occasionally, both in straight edges, and such as are in bending sweeps and curves.

The particular use of the Edging-Iron on these occasions is principally only to cut even any irregularities of the solid edge of the sward, which sometimes swells out irregularly more in some parts than others, and in such case, may sometimes require cutting half an inch, or a little more or less, evenly, not to reduce the sward more than is necessary, only cutting as much of the unequal solid along in a regular manner as to form the whole in an equally-even firm edge.

In performing this work in straight edges, a line may be set as a greater guide to cut regularly even and straight accordingly; but in curves, sweeps, or serpentine edges, the eye and a steady hand must be the guide: and, in both of which edgings, in using the Edging-Iron, should generally hold it oblique or slanting flat-ways to the edge, so cutting clean downward an inch or more deep, forming the edge even and upright; and let the cuttings be directly cleared away radically to the bottom.

And the Edging-Iron is also necessarily useful

ful in new-laid grafs-plats, &c. which generally require the edges of the fward to be cut in even to their proper form and limited bounds, and which can be effected with a proper Edging-Iron to greater exactness than with a spade, in a more even regular manner.

EDGING SHEARS. For trimming the rough edges of grafs-plats and lawns; different from the manner of an Edging-Iron before described, they being used principally only in cutting or clipping the projecting loose grafs, not in cutting the solid edge. See **EDGING-IRON.**

The most eligible kind of shears for this purpose are such as are in the form of sheep-sheering shears, wholly of iron, formed with a bow elastic handle, without any wooden handle as in the common garden-shears; and are useful in the summer season when the grafs is in full growth, which often grows out rough and irregular along the edge into the walks, &c. and should be trimmed in close and even, as occasionally required; and which may be expeditiously performed with these kind of shears, being held with one hand, running them along the edge, cutting, as you proceed, the loose projecting grafs, close and even to the solid fward.

This business, however, is often effected either with the point of common hedge-shears or sometimes with a garden knife: though the shears above described are best adapted for general use, by which to cut more expeditiously close and even.

EHRETIA—(*Ehretia*.)

Consists of tree-like exotics for the stove, garnished with oblong or oval leaves, and panicked flowers.

Class and order, *Pentandria Monogynia*.

Characters.] **CALYX**, a one-leaved, bell-shaped cup, with the border cut into five obtuse segments. **COROLLA**, monopetalous, with the limb divided in five oval parts. **STAMINA**, five subulate filaments, with roundish antheræ. **PISTILLUM**, a roundish germen, style slender, and obtuse stigma. **PERICARPIUM**, a roundish berry of two cells, containing four seeds, convex on one side and angular on the other.

The species are,

1. EHRETIA tinifolia.

Timus-leaved, Jamaica Ehretia.] Hath a woody stem with many branches, garnished with smooth, oblong, pointed leaves on short foot-stalks, and placed alternate; the flowers are white, and come out in a panicle at the ends of the branches, and succeeded by yellow, cherry-like fruit full of pulp.

2. EHRETIA Bourreria.

(*Bourreria*)—or oval-leaved *Jamaica Ehretia*.] Hath a woody, branching stem, garnished with alternate, oval, entire, polished leaves, and white flowers in a corymbus, which are succeeded by red fruit filled with pulp.

3. EHRETIA exsucca.

Juiceless-fruited American Ehretia.] With wedge-shaped-lanceolate leaves, the margins reflexed.

These plants are natives mostly of the West-Indies and hot parts of America, and are retained here in many of our hot-houses; admired for their singular exuberant foliage, particularly the first two species, or more generally the former; though they all form conspicuous variety in the stove collection.

They are propagated by seeds sown in pots and plunged in a hot-bed, and afterwards separated into single pots and replunged into the bark-bed in the stove, where they are to remain, and treated as other woody West-Indian plants of the like nature: they may also be raised from cuttings, and managed as the seedlings.

ELÆAGNUS, Oleaster or Wild-Olive. It furnishes two ornamental deciduous shrubs for the shrubbery and stove, garnished with narrow, silvery leaves, and small, apetalous flowers.

Class and order, *Tetrandria Monogynia*.

Characters.] **CALYX** is monophyllous, bell-shaped, quadrifid, and the inside coloured. **COROLLA**, none. **STAMINA**, four filaments, and oblong, incumbent antheræ. **PISTILLUM**, a roundish germen, simple style, and single stigma. **PERICARPIUM**, an oval, drupaceous fruit, inclosing an oblong, obtuse nut.

The species are,

1. ELÆAGNUS angustifolius.

Narrow-leaved Oleaster.] Elæagnus, with an upright, woody stem, branching twelve or fourteen feet high; narrow, spear-shaped, shining, satiny leaves, three or four inches long, and scarce half an inch broad; and from the axillæ, small flowers having silvery studded cups, yellow within, succeeded by small olive-shaped fruit.

2. ELÆAGNUS spinosus.

Thorny elliptic-leaved Oleaster.] Elæagnus, with an upright, woody stem, branching twelve or fourteen feet high; elliptical, silvery, downy-leaves, two inches long, and near one broad, sharp thorns under each leaf; and small flowers, having the calyx yellow within, succeeded by olive-shaped fruit.

Both these trees merit culture, the first for the shrubbery, the second for the stove; their

silvery leaves render them very conspicuous, and effect a delightful variety.

Their propagation is easily effected by layers of their young shoots, also by cuttings, which will be rooted in one year, and may then be transplanted, placing the hardy kinds in the nursery, to have two or three years' growth, when they will be fit for the shrubbery.

ELÆOCARPUS (*Elæocarpus*).

Furnishes a shrubby Indian exotic for the stove.

Class and order, *Polyandria Monogynia*.

The species is,

ELÆOCARPUS ferratus.

Serrated-leaved Indian Elæocarpus.] A shrubby plant with oblong, shining leaves, and flowers produced in spikes, having a five-leaved calyx, quinquepetalous corolla, many stamina, and one pistillum, succeeded by small olive-shaped fruit.

It is retained in curious stove collections to increase the variety of exotics in that department; should be kept in pots of light earth; and is propagated by seed, layers, and cuttings, assisted by the heat of the bark-bed; and continued always in the stove.

ELEPHANTOPUS, Elephant's foot.

In this genus are some herbaceous, fibrous-rooted, flowering perennials, for the green-house collection; having oblong and oval leaves, and upright annual stalks a foot high, crowned with heads of purple compound flowers, contained in a four-leaved general involucre, including many smaller partial cups, each with four flosculi, tubulous-tongue-shaped, furnished with five stamina, one style, and a single seed inclosed in the calyx.

Class and order, *Syngenesia Polygamia Segregata*.

The principal species in our gardens are,

ELEPHANTOPUS scaber.

Rough-leaved Indian Elephantopus.] With upright stalks and oblong rough leaves.

ELEPHANTOPUS tomentosus.

Tomentous-leaved American Elephantopus.] With upright stalks, and oval, downy leaves.

These two species being exotics of somewhat tender quality, should be kept in pots of light, rich earth, and have protection of a green house in winter; and placed in a sheltered situation in the full air in summer, in which they will flower in June or July.

They are propagated by seeds in the spring in a hot-bed; and occasionally by root off-sets.

EMPETRUM, Black-berried Heath, or Crow-berry.

Comprises two small under-shrubby plants of trailing and erect growth, for the shrubbery and green-house.

Class and order, *Diœcia Triandria*.

The plants are of slender growth, closely garnished with very small leaves, and small male and female flowers distinct on separate plants; having triphyllous cups, a corolla of three oblong petals, containing three male stamina, and a depressed germen in the females, succeeded by roundish berries having nine seeds.

The species are,

1. **EMPETRUM nigrum.**

Black Empetrum, or Common Black-berried Heath.] Low trailing stalks, very small leaves and flowers; and those in the female plants succeeded by small black berries.

Varieties.] Male-flowered, producing male flowers only—Female, producing the female flowers and fruit.

2. **EMPETRUM album.**

White-berried Portugal Empetrum.] With under-shrubby, upright stalks, closely set with very small linear leaves, and small male and female flowers; which in the female plants are succeeded by small white berries.

Varieties.] Male-flowered,—Female-flowered, and fruit-bearing.

Of these two species of Empetrum, the first is a hardy, mountainous plant in England, &c. principally in boggy situations; and the second is a tender exotic, requiring protection of a green-house in winter; both the sorts are introduced in garden collections for variety, the former to diversify the front of shrubbery clumps; and the latter that of the green-house, disposing it in the front row, in which it will effect an agreeable variety.

They are propagated by seed, slips, layers, and bottom off-sets; sowing the seed of the first sort in a shady moist border, in the spring; and the second in pots, placed under glasses or forwarded in a hot-bed; and in both sorts by slips and layers of the young shoots in spring and summer.

EPHEDRA, Shrubby Horse-tail.

Two species of low, under-shrubby evergreens, with rushy-like shoots and leaves, for the shrubbery, &c.

Class and order, *Diœcia Monadelphica*.

They are of low growth one to two feet high, with male and female flowers on separate plants, produced in amentums, without corolla or petals; seven monadelphious stamina, two oval germens, and short styles, succeeded by berries having two seeds.

The species are,

1. **EPHEDRA distachya.**

Twin-Amentous, Shrubby Horse-tail.] Ephedra with a low, under-shrubby stalk, branching two feet high, having many swelling joints,

joints, sending forth opposite, narrow shoots, branching out into long rushy tufts, opening like leaves, there being no other.

2. *EPHEDRA monostachya*.

Single-Amentous, Shrubby Horse-tail.] With a lower, under-shrubby stalk and branches about a foot high, similar in growth to the other.

These shrubby plants may be employed in the fronts of small shrubbery clumps; their singularity will increase the variety.

They are propagated plentifully by suckers or off-sets, arising from the creeping roots, which may be transplanted in February or March.

EPIGÆA, Trailing Arbutus.

Consists of one low, trailing, flowering shrub, for the shrubbery.

Class and order, *Decandria Monogynia*.

It produces bunches of flowers at the ends of the branches; having a double, six-leaved calyx, a monopetalous, tubular-salver-shaped corolla, five-parted above; ten stamina, a globular germen, crowned by a quinquefid stigma, succeeded by a globose-pentangular, many-seeded fruit.

The species is,

EPIGÆA repens.

Repent Virginia Epigæa, or Trailing Arbutus.] With trailing, repent, or rooting stalks, garnished with oblong, waved leaves, and loose bunches of white flowers at the ends of the branches, in autumn.

This trailing plant is admitted in shrubberies for variety; generally arranged towards the front, in which, disposed in assemblage, it will effect a proper diversity in growth and flowering.

It is propagated by cuttings or slips of its rooting stalks, and by layers and off-sets; all in autumn or spring.

EPILOBIUM, Willow-herb, French Willow, or Rose-bay Willow-herb.

This genus furnishes several herbaceous flowery perennials for the full ground, producing annual stalks of three or four feet stature, narrow leaves, and terminated by long spikes of quadripetalous flowers.

Class and order, *Oëlandria Monogynia*.

Characters.] *CALYX*, four oblong, pointed, coloured leaves. *COROLLA*, four roundish, cruciform petals. *STAMINA*, eight filaments alternately shorter, and compressed antheræ. *PISTILLUM*, a long cylindric germen under the corolla, slender style, and quadrifid, revolute stigma. *PERICARPIUM*, a long, cylindric, furrowed, quadrilocular capsule, and oblong seeds crowned with down.

The species are,

1. *EPILOBIUM angustifolium*.

Narrow-leaved Epilobium.] Epilobium with very creeping perennial roots, upright flower-stems, branching erectly four feet high, long spear-shaped leaves placed irregularly, and all the branches and main stem terminated by long erect spikes of purple flowers, of very ornamental appearance.

Varieties.] With white flowers,—white purple-striped flowers,—with broad leaves, and white flowers.

2. *EPILOBIUM hirsutum*.

Hairy Epilobium.] Epilobium with very creeping perennial roots, upright hairy stalks, branching erectly, three feet high, spear-shaped, sawed, decurrent, hairy leaves placed opposite, and all the branches and main stem terminated by erect spikes of purple flowers.

3. *EPILOBIUM palustre*.

Marsh Willow-herb.] With erect stem, leaves lance-shaped, entire, and opposite; and flower-petals emarginate or end-notched.

4. *EPILOBIUM latifolium*.

Broad-leaved French Willow.] With upright stem, lance-ovate, alternate leaves; and large flowers unequal.

5. *EPILOBIUM alpinum*.

Alpine Creeping French Willow.] Stem creeping, leaves ovate-lance-shaped, entire, and opposite, and seed-pods sessile.

6. *EPILOBIUM tetragonum*.

Quadrangular-stalked French Willow.] Stem four-cornered, leaves lance-shaped, denticled, the lowest ones opposite.

Most of these plants run up with tall stems, and some are of very branchy spreading growth; and, in general, with all the stems and branches terminated by long spikes of flowers of very showy appearance; they mostly delight in moist situations, but will succeed any where, and are all very eligible for large flower-borders and other conspicuous compartments of the pleasure-garden, in which they will flower very ornamentally in great profusion, in long succession, in summer and autumn.

Several of the sorts grow naturally in shady moist places, in many parts of this country: the first species and varieties are inhabitants of shady woods; the second, and some others, are natives of marshy places, sides of rivulets, brooks, and watery ditches, and mostly of rambling growth, both in root and stalks; but being ornamental in their mode of flowering, have been long admitted into gardens to increase the collection of flowery perennials, and are good furniture for large borders, but are peculiarly adapted for shady moist places; they

they flower abundantly in July and August, continuing a month or six weeks.

They obtained the name of willow-herb from the great resemblance of their shoots and leaves to those of the willow.

All the species are propagated in great plenty by their creeping roots, in spring or autumn, which may be divided and planted at once where they are to remain, and they will flower at their usual season.

EPIMEDIUM, Barrenwort.—It furnishes one low, herbaceous, flowery perennial.

Class and order, *Tetrandria Monogynia*.

Characters.] CALYX, tetraphyllous and deciduous. COROLLA, four cruciform oval petals, and four large cup-shaped nectariums. STAMINA, four filaments, and bilocular antheræ. PISTILLUM, an oblong germen, short style, and simple stigma. PERICARPIUM, an oblong, unilocular capsule, and many oblong seeds.

The species is,

EPIMEDIUM *alpinum*.

Alpine Epimedium.] Epimedium with creeping perennial roots, crowned by many stalks eight or nine inches high, dividing at top by threes, each division garnished with heart-shaped stiff folioles, and flower-stalks six inches high, dividing into smaller, each supporting three reddish cruciform flowers in May.

It delights most in shady borders, and may be propagated at pleasure by its creeping roots.

ERICA, Heath.

This genus furnishes a beautiful collection of evergreen flowering shrubs, a few of which grow naturally in many commons and waste lands in England; but those for our purpose are a number of exotics mostly of African growth, which highly deserve a place in every good green-house.

Class and order, *Oelandria Monogynia*.

Characters.] CALYX, a four-leaved cup, oval-oblong and permanent. COROLLA, monopetalous, quadrifid, ventricose, and bell-shaped. STAMINA, eight capillary filaments, inserted in the receptacle, and topped with bifid antheræ. PISTILLUM, a roundish germen, style slender, erect, and crowned with a four-cornered, quadrifid stigma. PERICARPIUM, a roundish, four-celled capsule, containing many small seeds.

This genus consists of more than fifty species, the most material of which are,

Erica with awned antheræ.

1. ERICA *lutea*.

Yellow Heath.] With linear opposite leaves, and clusters of yellow flowers.

Erica with awned antheræ, and three-fold leaves.

2. ERICA *halicacaba*.

Purple-stalked Heath.] With three-fold leaves, solitary flowers, the corolla of which is oval and inflated, and included style.

3. ERICA *monsoniana*.

Bladder-flowered Heath.] With three-fold leaves, oblong, inflated, whitish flowers terminating the branches.

4. ERICA *mucosa*.

Mucous Heath.] With three-fold leaves, and roundish small purple flowers.

5. ERICA *urceolata*.

Pitcher-flowered Heath.] With three-fold leaves, lanceolate cup, with oval-conic vilous whitish flowers growing in an umbel.

6. ERICA *marifolia*.

Marum-leaved Heath.] With three-fold, oval, downy leaves, white underneath, and ovate-conic flowers.

7. ERICA *arborea*.

Tree-like Heath.] With hoary branches, three-fold leaves, and bell-shaped flowers.

8. ERICA *cruenta*.

Bloody-flowered Heath.] With three-fold, smooth leaves, and incurved, cylindraceous, deep-red flowers.

Erica with awned antheræ, and four-fold leaves.

9. ERICA *ramentacea*.

Slender-branched Heath.] With four-fold bristly leaves, and globular purple flowers.

10. ERICA *persoluta*.

Bluish-flowered Heath.] With four-fold leaves, and bell-shaped flesh-coloured flowers.

Erica with antheræ crested, and three-fold leaves.

11. ERICA *baccans*.

Arbutus-flowered Heath.] With three-fold, imbricated leaves, and covered, round-bell-shaped, small flowers.

12. ERICA *corifolia*.

Slender-twiggied Heath.] With four-fold leaves, ovate corolla, and flowers growing in an umbel.

13. ERICA *triflora*.

Three-flowered Heath.] With three-fold leaves, included style, and globose, bell-shaped flowers terminating the branches.

14. ERICA *australis*.

Spanish Heath.] With three-fold spreading leaves, cylindric and protruded style.

Erica with antheræ crested, and four-fold leaves.

15. ERICA *empetrifolia*.

Crowberry-leaved Heath.] With four-fold leaves, and oval sessile flowers.

Erica with awnless antheræ included, and three-fold leaves.

16. ERICA *capitata*.

Headed, Woolly Heath.] With three-fold leaves, and yellow sessile flowers.

Ericas with awnless antheræ included, and four-fold leaves.

17. *ERICA tubiflora*.
Tube-flowered Heath.] With four-fold fringed leaves, and large red clavated flowers.

18. *ERICA conspicua*.
Long-tubed yellow Heath.] With four-fold smooth leaves, and very long, pilous, curved, cylindric, yellow flowers.

19. *ERICA cerinthoides*.
Honeywort-flowered Heath.] With hairy four-fold leaves, and large red clubbed flowers in clusters at the ends of the branches.

20. *ERICA comosa*.
Tufted-flowered Heath.] With four-fold leaves, and oval-oblong flowers growing close together.

Ericas with protruded awnless antheræ, and three-fold leaves.

21. *ERICA Plukenetii*.
Smooth-twigged pencil-flowered Heath.] With three-fold leaves, cylindric corolla, and protruded style.

22. *ERICA petiveri*.
Downy-twigged pencil-flowered Heath.] With three-fold leaves, and large pointed red flowers with long protruded antheræ.

Other Ericas.

23. *ERICA herbacea*.
Herbaceous dwarf Heath.] With four-fold leaves, and one-ranked, oblong, purple flowers.

24. *ERICA concinna*.
Flesh-coloured Heath.] With petiolate, erect, smooth leaves, and umbellate, terminal, cylindric flowers.

25. *ERICA massoni*.
Tall downy Heath.] With imbricated pubescent leaves, and cylindric flowers growing in a head.

26. *ERICA multiflora*.
Many-flowered Heath.] With five-fold leaves, small, scattered flowers, and antheræ and style protruded.

27. *ERICA mediterranea*.
Mediterranean Heath.] With four-fold expanding leaves, and scattered, oval, purple flowers.

28. *ERICA grandiflora*.
Great-flowered Heath.] With linear four-fold leaves, and large, incurved, cylindric, yellow flowers, and protruded style.

All these species are natives of Africa, and require a green-house in winter, excepting the seventh, fourteenth, twenty-third, twenty-sixth, and twenty-seventh, which will stand this climate, by being sheltered with mats, &c. in severe weather: they are all of different heights, some rising eight or ten feet high, and others downward to one foot; the leaves of all of them are minutely-small and linear, and the flowers, though not large but nume-

rous, make a beautiful appearance, some continuing in bloom great part of the year.

Propagation.

By cuttings or slips of the young shoots:— in the spring, about March or April, take off a quantity of the young shoots, plant them in pots of rich earth, which plunge in a hot-bed, giving frequent waterings and occasional shade from the sun; they will soon strike root and become proper plants to be potted singly in small pots; or young cuttings or slips planted in June or July in pots, plunged in a slight hot-bed, and shaded, will soon get root, and may be transplanted into single pots.

By seeds:—sow the seeds in a pot of fine rich earth in the spring, plunged in a hot-bed; and when the plants are come up two or three inches high, may be pricked out into single pots and replunged, and in autumn placed in the warmest part of the green-house, where they may remain during the winter.

ERIGERON.

This genus furnishes some hardy, fibrous-rooted, herbaceous perennials, and an annual; all of the compound-flower tribe, and proper to introduce for variety and as flowering plants.

Class and order, *Syngenesia Polygamia Superflua*.

The plants are of upright growth, one or two feet high, or more, garnished with oblong and spear-shaped leaves, and radiated, compound flowers, consisting of many small florets in one general calyx, containing tubular hermaphrodite ones in the disk, having each five stamina and one style, and very narrow female florets in the radius, furnished with a pistillum, and in all the florets, each a single seed.

The principal species are,

1. *ERIGERON acris*.

Acrid Common Erigeron.] With peduncles alternate, each having one blue flower.

2. *ERIGERON philadelphicum*.

Philadelphian Multiflorous Erigeron.] With spear-shaped leaves half clasping the stem, and the stalks many-flowered.

3. *ERIGERON alpinum*.

Alpine two-flowered Erigeron.] With the stalks mostly two-flowered, and the calyx somewhat hairy.

4. *ERIGERON purpureum*.

Purple Erigeron, or Labrador Aster.

5. *ERIGERON canadense*.

Canada, White, Annual Erigeron.] With the stem and flowers panicled, and spear-shaped, ciliated leaves.

These plants are proper to introduce in any of the flower compartments in assemblage; and are propagated, the perennials by seed, and

and by bottom off-sets, and slips of the root; and the annual sort by seed in the spring, sown in patches in the flower-borders to remain.

ERIOCEPHALUS. (*Erioccephalus*).

Two shrubby, African evergreens, of the compound-flowering tribe, for the green-house or stove.

Class and order, *Syngenesia Polygamia Necessaria*.

They are of upright growth four or five feet high, adorned with divided and narrow entire leaves, and the branches terminated by clusters of compound, radiated, white and reddish flowers; having a scaly, general calyx, including many funnel-shaped male florets in the disk, and flat female ones in the radius; five male stamens, one style in the females succeeded by a naked seed.

The species are,

1. ERIOCEPHALUS *africanus*.

African Downy-leaved Erioccephalus.] With downy woolly leaves divided into three or five parts; and flowers growing in a corymbus.

2. ERIOCEPHALUS *racemosus*.

Racemous-flowering Cape Erioccephalus.] With linear, narrow, silvery, entire leaves, and flowers disposed in racemous clusters.

3. ERIOCEPHALUS *pectinatus*.

Pectinated-leaved Erioccephalus.] These shrubby exotics being evergreen, make an agreeable variety at all seasons in the green-house collection; and flower annually in autumn; the flowers, all compound, have a white radius, and reddish-purple disk, of a conspicuous, ornamental appearance.

They may be propagated by layers, and cuttings of the young shoots, in spring and summer, assisted by the heat of a bark-bed or other hot-bed.

ERODIUM pentandrious Geranium, or Crane's-bill.

Consists of several herbaceous and annual plants with one species of a shrubby nature.

Class and order, *Monadelphia Pentandria*.

Characters.] CALYX, five oval, permanent leaves. COROLLA, five oval petals, with a nectarium of five scales, placed alternately with the filaments. STAMINA, five filaments conjoined together at their base, and topped with oblong, versatile antheræ. PISTILLUM, a five-cornered germen, long, permanent style, and five reflexed stigmas. PERICARPIUM, a long, rostrated fruit, spiral and bearded, with five cells containing five seeds.

This genus has heretofore been ranged with the common Geranium: but as that family have ten prolific stamens and this but five, late botanists have thought it more eligible to separate them.

The species for our purpose are,

1. ERODIUM *crassifolium*.

Thick-leaved, upright Crane's-bill.] Crane's-bill with a fibrous root, broad, pinnatifid, lacinated; linear-leaves, and many flowers growing in an umbel.

2. ERODIUM *chamædryoides*.

Dwarf Crane's-bill.] Crane's-bill with a fibrous-root, crowned with kidney-shaped, crenated leaves, and between them flower-stalks terminated each by a white flower streaked with red lines: this is a neat little plant growing about three inches high.

3. ERODIUM *incarnatum*.

Flesh-coloured Crane's-bill.] Crane's-bill with an under-shrubby stalk branching two or three feet high, trifid, lobate, dentated leaves, and entire, ovate petals, flesh-coloured, and at their bottoms marked with a red and yellow circle.

The two first species require a green-house for their protection in winter, and are propagated by seeds, or parting their roots (see GERANIUM). But the third species produces its seeds but sparingly, therefore is increased by cuttings, as the Pelargoniums (which see), and must be regarded as a green-house plant of the most tender kind.

ERYNGIUM, Eryngo, or Sea Holly.

This genus comprises several hardy, herbaceous, flowery perennials, producing erect stalks, from one to three feet high; simple, entire, and divided prickly leaves; and the stalks terminated by roundish aggregate heads of quinquepetalous flowers.

Class and order, *Pentandria Digynia*.

Characters.] CALYX, a conical receptacle, common to many florets, having a five-leaved general involucre, and each floret a pentaphyllous calyx coloured above. COROLLA, each floret is of five inflexed petals, collected into a roundish uniform head. STAMINA, five filaments and oblong antheræ. PISTILLUM, hairy germen, two styles, and simple stigmas. PERICARPIUM, an oval two-parted fruit to each floret, having each one taper seed.

The principal species are,

1. ERYNGIUM *maritimum*.

Maritime Eryngo, or Sea Holly.] Eryngium with creeping, penetrating, fleshy, perennial roots crowned by roundish, plaited, stiff, spinous-edged leaves, and between them upright stalks a foot high, garnished with small roundish leaves, and terminated by roundish heads of whitish blue flowers.

2. ERYNGIUM *amethystinum*.

Amethystine-coloured Styrian Eryngo.] Eryngium, with perennial roots, crowned with trifid,

trifid, hand-shaped, many-pointed leaves, somewhat pinnated at the base; upright blue stalks two feet high, garnished with many-parted spinous-leaves, and terminated at top by roundish-heads of amethystine or purple-violet-coloured flowers—and with the stalks and leaves of a fine amethystine-blue, singular and curious.

Variety.] With pale amethystine heads of flowers.

3. ERYNGIUM planum.

Plane-leaved Russian Eryngo.] Eryngium with downright perennial roots, crowned with oval plane leaves, crenated on the edges, upright blue stalks two or three feet high, garnished with many-pointed spinous leaves, and terminated at top by peduncled, oval heads of amethystine-blue flowers.

Variety.] With stalks white upward, and white heads of flowers.

4. ERYNGIUM alpinum.

Alpine Geneva Eryngo.] Eryngium with perennial roots, crowned with heart-shaped, sub-orbicular leaves, upright stalks branching each way two or three feet high, adorned with deeply divided, many-pointed leaves, all ending in spines, and all the branches and main stalk terminated by conical light-blue heads.

5. ERYNGIUM aquaticum.

Aquatic American Eryngo.] Eryngium with perennial roots, crowned with long, sword-shaped, stiff, sawed, spinous leaves a foot long, and between them an upright single stalk two feet high, terminated by oval, whitish-blue heads of flowers.

6. ERYNGIUM fœtidum.

Stinking Virginia Eryngium.] Eryngium with radical leaves, spear-sword-shaped, sawed, a two-forked stem, and floral leaves multifid.

All these species of *Eryngium* are hardy perennials, the root durable, but annual in stalk; the first of which is a maritime plant, growing naturally on the sea shores in many parts of Britain, &c. the second, third, and fourth inhabit mountainous places of the continent; and the fifth and sixth sorts are of America; all of which are retained in curious gardens, as plants of singularity and ornament.

The flowers of all the sorts are collected into close roundish heads at the top of the stalks, each head composed of many florets. See the *Characters*.

They all flower principally in July, and the seeds ripen in September.

All the sorts succeed in any of the borders or other compartments, though the first sort is the most prosperous in gravelly or sandy soils.

They are propagated by seeds, sown either in autumn or spring, in a bed or border, and raked in: the autumn sowing generally comes up strongest in spring following; and in autumn after transplant the plants into the places where they are to remain to flower.

ERYSIMUM, Hedge Mustard.

One species for the flower-garden: a fibrous-rooted, herbaceous perennial, furnishing a variety noted as an ornamental flowering plant.

Class and order, *Tetradynamia Siliquosa*.

It produces annual upright stalks, sinuated leaves, and cruciform yellow flowers, having four-leaved closed calyxes, a corolla of four equal petals, four long, and two shorter stamens, and one pistillum, succeeded by a siliquose, four-cornered, bivalvous seed-pod.

The species is,

ERYSIMUM Barbarea.

(Barbarea)—or *Lyrate-leaved Hedge Mustard, or Yellow Rocket.*] With the leaves lyre-shaped, sinuated, the outermost roundish, and yellow flowers.

Varieties.] Double-flowered—called double yellow rocket—common single flowered.

Both the varieties are hardy; but the double kind is the most noted as an ornamental flowering plant, and as such merits admittance in the flower-compartments, and is propagated by bottom off-sets, slips, &c.

ERYTHRINA, Coral-tree.

This genus furnishes some curious shrubby and herbaceous exotics, of India and America, for the stove; singularly ornamental in their flowering; growing eight or ten feet high in the shrub kinds, the herbaceous about two feet; adorned mostly with ternate leaves, and one with simple foliage; and most beautiful papilionaceous flowers, terminating the branches, in thick, close, scarlet, coralloide spikes.

Class and order, *Diadelphia Decandria*.

Characters.] CALYX is monophyllous, tubular, and entire. COROLLA, is papilionaceous, and of five petals; the standard spear-shaped and very long; the wings oval and short; and the keel dipetalous. STAMINA, ten diadelphous filaments, and arrow-headed antheræ. PISTILLUM, a pediculated subulate germen, and style, and simple stigma. PERICARPIUM, a long, swelling, unilocular pod, and kidney-shaped seeds.

The principal species:

1. ERYTHRINA Corallodendrum.

(Corallodendrum)—or *Common Smooth Indian Coral-tree.*] Erythrina with a tree-like woody-stem, branching irregularly ten or twelve feet high, smooth trifoliate leaves, hav-

ing heart-shaped lobes, and from the ends of the branches short thick spikes of beautiful scarlet flowers.

2. *ERYTHRINA spinosa*.

Spineous Indian Coral-tree.] Erythrina, with a tree-like woody stem, branching ten or twelve feet high, armed with spines, trifoliate prickly leaves, and red spikes of flowers.

3. *ERYTHRINA picta*.

Painted or Black-thorned Coral-tree.] Erythrina with shrubby stalks, dividing into branches, five or six feet high, strongly armed with black spines; trifoliate small leaves, and pale scarlet spikes of flowers.

4. *ERYTHRINA planifolia*.

Plane-podded American Coral-tree.] With oblong simple leaves, and plane seed-pods.

5. *ERYTHRINA herbacea*.

Herbaceous Carolinian Erythrina.] Erythrina with a thick woody root, sending up herbaceous stalks annually in spring, two feet high, garnished below with trifoliate narrow-pointed leaves, and terminated by long scarlet spikes.

All these plants being natives of hot countries in Africa and America, require the constant shelter of a stove in England, so must always be kept in pots, and retained in that department.

They flower here in our stoves, in summer are extremely beautiful, but are not succeeded by seeds in this country.

All the sorts are propagated by seed, which are annually imported hither from Africa and America. Sow them half an inch deep in pots of light rich earth, which plunge in the bark-bed of the stove, &c. and when the plants are two inches high, prick them in separate small pots, plunging them also in the bark-bed; give frequent waterings, and as they increase in growth, shift them into larger pots, and may be placed in any part of the stove.

ERYTHRONIUM, Dog's Tooth.

(*Dens Canis*.) or Dog's Tooth Violet.

The plants are low, herbaceous, flowery perennials for the full ground, rising four or five inches high, terminated by hexapetalous flowers.

Class and order, *Hexandria Monogynia*.

Characters.] **CALYX**, none. **COROLLA**, six oblong petals, reflexed, and spread open to their base. **STAMINA**, six short filaments and oblong antheræ. **PISTILLUM**, a turbinate germen, simple style, and triple stigma. **PERICARPIMUM**, a sub-globose trilocular capsule, and many oval flat seeds.

There is but one species, which, however, admits of several varieties, all of the flowery tribe.

The species is,

ERYTHRONIUM Dens Canis.

(*Dens Canis*)—or *Dog's Tooth*.] Erythronium with oblong, tooth-shaped, fleshy, white perennial roots, crowned by two oval, purple and white spotted leaves, united at their base, and between them, an upright, naked purple stalk, four inches high, terminated by one drooping flower, having six spear-shaped reflexed petals, of different colours in the varieties.

Varieties are,] Dog's Tooth with white flowers—with purple flowers—with pale red flowers—dark red flowers—crimson flowers—yellow flowers, but rare—and dog's tooth with narrow leaves, and flowers of the above colours.

All these varieties are hardy, durable in root, but annual in leaf and stalk, which rise early in spring, and flower in April, but rarely furnish good seeds in England; they may be all employed to adorn the fronts of borders, planting them in small patches, in which they will make a good appearance.

Their propagation is by off-sets from the roots, when their leaves decay, from June till September.

ESCULENT PLANTS. All such plants as are eatable and usually cultivated in kitchen-gardens, &c. for the table; comprehending both all the eatable root kinds, as carrots, parsneps, turneps, potatoes, &c. and all the herb kinds, and other plants in which the tops are the eatable parts; and the same appellation of esculent is also applicable to all the sorts of eatable fruits.

ESPALIERS, ranges of dwarf fruit trees, trained to a treillage of wood-work in such order as to form a kind of hedge.

Espaliers are commonly arranged in a single row in the borders round the boundaries of the principal divisions of the kitchen garden, there serving a double or treble purpose, both profitable, useful, and ornamental; they produce plentifully of large fine fruit, without taking up much room, or any ways incommoding the ground, and being in a close range, hedge-like, they, in some degree, shelter the esculent crops in the quarters; and having borders immediately under them on each side, afford different aspects for different plants, as they shall require at different seasons of the year; as in the winter for shelter; the spring for forwardness; and the summer for shade; and as to the ornament and variety, what can be more delightful in spring, in the excursion of the walks, than the charming appearance the trees make when covered with their showy bloom, differing in them-

themselves, in those of different genera, species, and varieties; in summer, to see the fruit of the different sorts advancing gradually to perfection; and in autumn, how pleasing to find the various kinds arrive successively at maturity: and as the trees are arranged all of an equal height, not exceeding six or seven feet, closely furnished with branches ranged horizontally at regular distances one above another, from the very ground upward, the fruit hereby exhibits itself to great advantage, and being low, and the branches fixed, is not liable to be blown down by wind.

An Espalier has this advantage over a wall tree, that as being wholly detached, the branches have liberty to form fruit spurs on both sides, which in the wall-tree cannot be effected but on one.

The sorts of fruit usually employed to form Espaliers, are principally apples, pears, and plums; but several other sorts may also be used to increase the variety, as quinces, apricots, cherries, almonds, mulberries, vines, figs, filberds, &c.

Observe always however to contrive to have all those trees in the same line or range, that are nearly of the same growth, for the sake of uniformity.

They should be planted principally on those borders serving as the immediate outer boundary to the quarters of the kitchen garden, and immediately verging the principal walks; they may also be planted in similar order in pleasure grounds, &c. if thought convenient. The width of the borders may be about six feet, and the line of Espaliers placed four feet at least, from the outer edge, and eighteen or twenty feet distant in the row, especially for apples, pears, and plums; though for apples and pears grafted, &c. on free stocks, twenty-one feet is not too much; but the trees planted at that distance, taking a long time before they approach each other to fill the Espalier, they appear straggling and irregular, that few persons plant them above fifteen to eighteen or twenty feet asunder; if however they are planted only fifteen or eighteen feet distance, they will meet and form a close Espalier sooner by some years; and when they begin to interfere and incommode each other, the interfering branches of every other tree may be gradually cut away annually in winter-pruning, to give the intermediate trees room to advance and meet each other, and at last the others may be taken quite away, and the remaining trees standing at thirty or six and thirty feet distance will have full scope to spread.

Their general training and planting.

All trees intended for Espaliers, that are propagated by grafting and budding, should be grafted or budded within six inches of the ground, to procure lower branches to furnish the Espalier, quite from the bottom regularly upward; and the first shoots from the graft or bud should also in spring, when a year old, be headed down within five or six inches of the graft, to force out a supply of five, six, or more good shoots at that part, for the reason just mentioned; and whether the trees are then in the nursery or planted in the Espalier, the shoots or branches so obtained should, the same summer or autumn, when eighteen inches or two feet or more long, be trained along as they advance to stakes placed for that purpose, laying the shoots to the right and left horizontally in the position proper to give them the first necessary form as Espalier-trees; if the trees are raised in nurseries for sale, the above practice is eligible, whereby the trees are rendered more saleable, and their value increased; and if the first heading does not furnish the supply of lower branches required, you may practise a second heading, either in whole, or only some of the middlemost shoots, or as you shall judge necessary; afterwards they must be trained all principally at full length.

When the trees in the nursery are from two to four or five years old from the grafting or budding, being furnished with six, eight, ten, or more good branches near the bottom, properly situated for ranging two ways, according to the line of the Espalier, they are then fit for planting out finally for that purpose, observing the distances as before-mentioned. If apples and pears upon dwarf stocks, fifteen or eighteen feet may be sufficient; but if upon free stocks, twenty-one feet at least is necessary: plums should also be planted eighteen feet distance at least in the line; cherries, apricots, figs, mulberries, vines, &c. never less than fifteen distance, but if eighteen the better: as soon as they are planted, place stakes, ranging the way of the row, and to which tie the branches with osier twigs, those of each tree horizontally to the right and left, keeping an equal number on each side, at six or eight inches distance one above another, and at full length, except a farther supply of more branches may be wanting, to furnish the bottom and middle of the tree; then shortening is to be practised according to the rules aforementioned, in order to obtain the proper supply; afterwards train all the branches at full length, till all those of each tree meet, and all redundant shoots more

than the allotted horizontals are to be displaced.

Another method of forming Espalier trees, sometimes practised, is, after having headed down the first shoots, as above ordered, and suppose the tree in consequence furnishes about three bottom shoots, the two side ones are trained horizontally, the way of the Espaliers, and the middle one is trained upright; if five shoots, two must go to each side, and the middle one perpendicular: this perpendicular shoot must still be directed upwards, to furnish more lateral shoots for horizontals, which must be trained horizontally to each side, as above, still continuing your upright in the middle; observing however, if the upright shoot should not throw out horizontals low enough, it should be shortened, whereby it will furnish fresh shoots at any desired height, two or four of which, according to the number produced, are to be used for horizontals, and one still directed up the middle for a stem, and so continue increasing your number of horizontals annually, ranging from each side of the stem, at six or eight inches one above another, from bottom to top of the Espalier.

In planting Espaliers, in respect to the treillage for training the branches upon, you may either only place four or six common stakes to each tree, in a line, just to train the branches the first two or three years, till the trees are somewhat advanced; then taking these away, form a regular treillage-work as directed below; or if you are anxious to preserve uniformity, a general treillage may be formed at once, at first planting of the trees.

These treillage-works for the above purpose may be of different degrees of taste for use and ornament, according to your fancy or convenience: the cheapest and the soonest made, is that of straight stakes driven into the ground a foot distance, and sawed level at top, five or six feet high; and slips of deal, or poles arranged along the top the whole length, and so train the branches of the trees along, from stake to stake.

But for the sake of ornament, a regular frame or treillage may be formed of square timbers, and to have it more durable, the principal posts might be of oak, two or three inches square, and rails carried from post to post, the first about twelve inches from the bottom, one at top, and a third in the middle space; or, if a high espalier, may have four or five rails: then thin square slips of deal, or small ashen poles, &c. are fixed upright to the rails on the side next the trees, a foot

asunder; and paint the whole with oil-colour, to render it more ornamental and durable.

To either of the above-treillage-work, the Espalier-trees are to be trained in a regular manner, bringing the lowermost branches down horizontally within six or eight inches of the ground, tying or nailing them to the uprights of the treillage; the next course five or six inches above these, in the same position; the same of the next and every succeeding course all the way up, preserving an equal number on each side, ranging exactly in the same horizontal position, and distance from bottom to top, training them always along at full length, except, as aforesaid, there be a want of wood in any part; then, to force out the supply wanted, shorten some contiguous shoots to five or six inches, either the same summer they are produced, in June, otherwise not till spring following; and so continue every year increasing the number of horizontals, arranged as above, till the trees are furnished with branches one above another, from bottom to top of the treillage.

Their general pruning.

As to the general pruning of Espalier trees, observe for one thing, the branches are for the general part to be trained always at full length; for shortening more than just necessary to procure an occasional supply of wood, would not only produce a confusion of branches, but as the trees of apples, pears, plums, cherries, quinces, medlars, always produce their fruit upon spurs, as observed in the article DWARF TREES, which, if the branches are trained at full length, generally first form themselves towards the upper part, and gradually along the sides at each eye; that by shortening, it would cut away the said first fruitful parts, and from the lower eyes, that instead of forming spurs, force out strong unnecessary wood, and scarce any fruit; and this is the reason we see so many ill-formed Espalier-trees, many people thinking shortening the shoots is necessary to strengthen them as they call it, and hereby the tree throws out vast quantities of wood every summer, which they either then, or in winter, or spring pruning, cut out, generally leaving a stump of each shoot about an inch or two long, and from every eye of these stumps, more strong shoots rise the year following, and these are also stumped off in the same manner, and so they continue from year to year, by which means the tree is filled with large clustering ragged spurs, formed entirely of the stumps of shoots: therefore, always keeping in mind to continue all the shoots and branches principally at full length; and,

and, when necessary to cut out any superabundant wood, always take it off quite close, never leaving any stump; and constantly encourage the fruit spurs, which are natural shoots of from about half an inch to one or two in length; observing however, when any of these are worn out, or grown cankerous, or become very long, as to project considerably foreright, they should be cut out close, to make room for those of better growth.

Espaliers should have two principal dressings annually, i. e. summer and winter pruning.

The summer dressing is principally to regulate the shoots of the same year: and in which it should be observed, that, as in summer the trees often produce numbers of shoots more than are wanted, or can be trained in; therefore, keeping in mind the proper distances, and general position of the necessary branches to form each tree, begin early in June, and clear off all superfluities as they are produced, that is, all fore-right shoots issuing from the front and back of the branches; and those of very luxuriant growth should always be displaced, rubbing or cutting them off close; not however reducing any of those shoots produced immediately from the end of the branches, which must be left entire, one to each branch for a leader, or to extend the branches in length, and form a further supply of fruit-spurs. All other shoots, however good and well-placed, arising from the sides of the horizontals, and that are evidently superabundant, i. e. more than what can be trained in, consistent with the allotted distances and regular position of the general horizontals or bearing-branches, should also be taken off; observing, however, to preserve here and there a good shoot towards the lower part of the branches, in the most vacant spaces, or where bad branches occur, training them up between at full length till winter pruning; and if then not wanted, may be cut out: for it is necessary always, at any rate, to leave some as a reserve till winter, in case of any unforeseen vacancy happening. In the above manner go over the Espalier-trees of all sorts twice every summer at least, the first time early in June as aforesaid, and again in July. In the first dressing in June, if there is any vacancy wants filling, you may pinch any contiguous strong young shoot of the year, to three or four eyes, whereby it will furnish the like number of shoots the same season, which you may train into the vacant space.

The above summer-dressings are not only beneficial to the trees, but by clearing out useless wood, admit the sun and air to effect the growth and ripening of the fruit, and the whole appears in a neat, requisite regularity.

In performing the summer-dressings, if you begin betimes, before the young wood becomes long and woody, all redundancies may be rubbed off close by hand; but if the shoots are first suffered to be of considerable length, and hardened, the knife must be used, always rubbing or cutting close.

Winter pruning.—This may be performed any time from the fall of the leaf in November till March; in this pruning, a general regulation is to be observed both in the old and new branches, less or more, according to circumstances: examine first the state of all the main horizontals; observing that all the same former well-placed bearers, and the same regular-trained branches, in general, are to be wholly retained, as long as they continue in a good fruitful state, or others advancing in a prosperous way to that degree of maturity, only giving attention in this pruning, if any are casually decayed, or much declining, or that assume a singularly unprosperous habit, or very unfruitful growth, cut or prune them either to their origin, or cut down to some lower well-placed more fruitful young branch arising therefrom, or immediately adjoining, eligibly situated to supply the place of that cut away, if it shall appear necessary; likewise any casual long-extended old naked branch, unfurnished with proper fruit-spurs for bearing, or that does not support any lateral branches furnished therewith, should also be pruned in a similar manner: so, observing these particulars, retain all the proper, regular-trained horizontals, or general branches: and in which, where there are large clustering ragged spurs, formed by the remaining stumps of shortened shoots as before observed, cut them also off close, being careful to preserve all the natural fruit-spurs already described. Examine also such young shoots that were trained up in the summer-dressing; such of them as are well placed, and towards the lower parts of the main branches, and are likely to be wanted to fill any present or future vacancy, are to be left and trained up regularly at full length; for it is necessary always to have some young branches advancing below in the most vacant spaces, in training between the principal ones, in different parts, where you shall judge necessary, without crowding, to be coming forward gradually to a bearing state, to supply the place of such as are apparently declining, or but bad bearers; all other young shoots left in summer, that are not wanted for the above purpose, should now be cut out close, observing, as in the summer pruning, that all shoots arising singly, immediately from the ends of the horizontals, must now also be left entire, that

is, leaving only one to each branch as a leader, and to extend the respective branches in length, to fill the extent of Espalier allotted, as far as there is sufficient scope to extend them: so that every branch and shoot so reserved for training in, must, except in case of a vacancy, also still be continued along at full length, they will then naturally form fruit-spurs at almost every eye or bud all along their sides.

For as the branches of apples, pears, plums, cherries, &c. always produce their fruit upon spurs, which generally begin to form when the branches are two or three years old, provided the branches are left entire; but if shortened, they never form properly.

Having winter-pruned the trees, you must then proceed to fresh tie or nail all the horizontals, old and new, in a neat manner to the treillage, still preserving nearly an equal number on each side of every tree, and all at regular distances of five or six inches, and their position so much horizontal, as their extremities may not be above six or eight inches higher than the bottom parts, training every branch straight, clean from the bottom to the extremity, tying or nailing them nearly to the railing or uprights of the treillage.

The training and fastening the branches of the Espalier trees is performed both by tying and nailing them to the treillis, as may be convenient.

The tying is the most eligibly and neatly performed with small osier twigs, and is occasionally effected with old ship-rope-yarn, and sometimes with bafs, though this is much inferior to the other two; and the osiers for tying being in many places the most readily attainable, should chuse the smaller, slender, pliant twigs (see *Osier* and *Salix*); and with which the mode of tying is,—put the twig round behind the treillage, keeping the biggest end fast in the hand; bring the other part forward round the branch, which, being close to the treillis, twist that part of the twig about the larger end once or twice, close to the branch, and turn the point in betwixt that and the tying, drawing it moderately tight, and then cut both ends off even, to about an inch; and thus proceed with the general branches in regular order. If rope-yarn, or bafs, is occasionally used for this purpose, the tying should generally be brought twice round, moderately tight, to secure the branches effectually in their requisite position.

Or, if nailing in the branches is intended, it may be very neatly and effectually performed, if the railing or uprights of the treillis are of some tolerable substance, to admit of driving the nails therein; and for this occasion should

have more slender, smaller, sharp-pointed nails than those used in common wall-tree nailing; and, having a proper quantity of neatly-cut cloth shreds, proceed in laying-in and nailing the branches, in the same order as in nailing wall-trees.

In tying or nailing the branches, if any terminal shoot is not long enough to reach from the last fastening to the next rail or upright, and that it projects irregularly, should tie a small twig, &c. near the end, and thereby extend the shoot in the proper line and regular position, fastening the twig, or other tying, round the aforesaid next rail of the treillage.

EVERGREENS.

All sorts of trees, shrubs, and herbaceous plants that retain their green leaves the year round, may be denominated Evergreens, though it is most commonly understood of trees and shrubs, of which there are great numbers in our gardens and plantations, employed both for ornament, variety, and as forest-trees for timber, many of which are adapted to grow in any part of the habitable world; and in general their leaves are harder and less succulent than those of deciduous trees; they are not in the least influenced by the clemency or inclemency of seasons, but preserve them in constant verdure through the year; the old leaves remaining a long time after the formation of the new ones, and do not drop them at any determinate time.

Many herbaceous perennials enjoy the same privilege with the Evergreen trees in retaining their leaves, and resist the severities of winter; some even can dispense with earth for some considerable time, such are the house-leeks, navel-worts, aloes, &c. being replete with juices, which the leaves imbibe from the humidity of the atmosphere, sufficient for effecting the purposes of vegetation.

Although all the principal Evergreen trees and shrubs are treated of in the course of this work under their respective genera, we think it eligible to collect into one point of view a list of all the principal sorts commonly cultivated for plantations in the full ground, and which are proper for use and ornament in gardening.

So in this place we shall only exhibit the hardy sorts; for the others, see GREEN-HOUSE, HOT-HOUSE, &c.

Each sort is arranged according to its generic title, viz.

Arbutus, or strawberry tree—common arbutus, with oblong fruit—with round fruit—with red flowers—double blossomed common arbutus—oriental arbutus, or andrachne—curled-leaved andrachne.

Artemisia, mugwort—tree-wormwood.

Atriplex,

Atriplex, Sea-purflane tree—broad-leaved—narrow-leaved.

Baccharis, ploughman's spikenard.

Bignonia, trumpet-flower—Evergreen.

Bupleurum, shrubby *Æthiopian* hartwort.

Buxus, the box-tree—broad-leaved tree-box—narrow-leaved—gold-striped—silver-striped—gold-edged—curled striped-leaved—dwarf shrubby box.

Celastrus, staff-tree—Virginia upright *celastrus*—climbing *celastrus*.

Cistus, rock-rose—poplar-leaved—willow-leaved—bay-leaved—waved-leaved—round-leaved—sea-purflane-leaved—oblong white-leaved—hoary-leaved—Montpelier white gum *cistus*—ladaniferous *cistus*—Cretan *cistus*.

Clematis, virgin's-bower—Evergreen Spanish climber.

Cineorum, widow-wail, but one sort.

Cupressus, cypress-tree—common cypress, with upright branches—with spreading branches—with small fruit—blue-berried cypresses.

Cytisus, tree-trefoil—Evergreen Neapolitan *cytisus*.

Daphne, spurge-laurel—common spurge-laurel—variegated spurge-laurel.

Ephedra, shrubby horse-tail.

Erica, heath—some hardy species.

Euonymus, spindle-tree—Evergreen spindle-tree.

Hedera, ivy-tree—common green-leaved ivy-tree—gold-striped—silver-striped—black-berried—yellow-berried—dwarf creeping.

Hyssopus, hyssop—white-flowered—purple-flowered.

Ilex, the holly-tree—common; of which there are the following varieties—common green prickly-leaved—smooth green-leaved—green-leaved yellow-berried—box-leaved—gold-striped common prickly-leaved—silver-striped common prickly-leaved—gold-striped smooth-leaved—silver-striped smooth-leaved—narrow-leaved striped—cream-coloured striped—sawed-leaved—hedge-hog holly, having the whole surface of the leaves covered with short spines, of which there are, green hedge-hog—silver-striped hedge-hog—gold-striped hedge-hog—and silver-edged hedge-hog holly—blotched-leaved yellow-berried—Hertfordshire white-leaved—copper-coloured; with several other less material varieties—Dahoon broad-leaved holly.

Juniperus, Juniper-tree—common juniper—taller Swedish juniper—Spanish large-berried juniper—red Virginia and Carolina cedar—Bermudas cedar—Phœnician cedar—Lycian cedar—great, cypress-leaved Jamaica cedar—Savin tree—spreading savin—upright savin—striped savin: all the above are species and varieties of *Juniperus*.

Kalmia, broad-leaved—narrow-leaved.

Laurus, bay-tree—common bay—broad-leaved—narrow-leaved.

Lavendula, lavender—common spiked—broad-leaved—French.

Ligustrum, privet—Evergreen privet.

Lonicera, honeysuckle—Evergreen honeysuckle.

Magnolia, Evergreen magnolia, called laurel-leaved tulip-tree.

Medicago, moon-trefoil—shrubby, hoary, Evergreen *medicago*.

Mespilus, the medlar—Evergreen *mespilus*, *pyracantha*, or Evergreen thorn.

Myrtus, myrtle—broad-leaved.

Olea, olive-tree—common European.

Phillyrea, mock-privet—the common, oval-leaved, privet-leaved, and olive-leaved—the broad-leaved, with smooth leaves, prickly-leaved, and sawed-leaved—the narrow-leaved, with rosemary-leaves, lavender-leaved, and striped-leaved.

Phlomis, Jerusalem sage-tree—broad-leaved yellow *phlomis*—narrow-leaved yellow *phlomis*—purple *phlomis*, or Portugal sage-tree.

Pinus, pine-tree, fir-tree, and cedar of Lebanon:—pine kinds are, wild pine, called Scotch fir—pineaster, or long-leaved wild pine—Weymouth pine—great-coned stone pine—long three-leaved swamp pine—Cembra pine—frankincense large-coned pine—dwarf pine:—fir kinds are, silver yew-leaved fir—Norway spruce fir—Newfoundland white spruce fir—Newfoundland black spruce fir—Newfoundland red spruce fir—hemlock fir—long-coned Cornish fir—balm of Gilead, or sweet-scented fir—oriental fir—cedar of Lebanon.

Prinos, winter-berry—Evergreen winter-berry.

Prunus, plum-tree—Evergreen *prunus*, or laurel-tree; of which are, common green laurel—gold-striped laurel—and silver-striped laurel—Portugal laurel.

Pyrus, pear-tree—Evergreen sweet-scented Virginia crab-tree.

Quercus, oak-tree, and cork-tree—common Evergreen oak, with broad leaves, narrow leaves, and holly-leaved—cork-tree with broad leaves, and narrow-leaved—dwarf kermes oak—live oak.

Rhamnus, including *alaternus* and buckthorn—common *alaternus*—broad-leaved *alaternus*—jagged-leaved *alaternus*—blotched-leaved *alaternus*—gold-striped-leaved *alaternus*—silver-striped *alaternus*—Evergreen buckthorn with narrow leaves—olive-leaved.

Rhododendron, dwarf rose-bay.—The common dwarf-rose-bay—large American.

Rosa, rose-tree—Evergreen rose.

Rosmarinus,

Rosmarinus, rosemary—common green-leaved—gold-striped—silver-striped.

Ruscus, butchers'-broom—common myrtle-leaved, prickly butchers'-broom—broad-leaved hypoglossum, or tongue-upon-tongue laurel—Alexandrian laurel.

Ruta, rue—broad-leaved—narrow-leaved.

Salsola, shrubby glass-wort and stone-crop-tree.

Salvia, sage—common red-leaved—green broad-leaved—hoary broad-leaved—narrow-leaved—lavender-leaved—variegated-leaved.

Santolina, lavender-cotton—common hoary-leaved—hoary rosemary-leaved—green rosemary-leaved—minor rosemary-leaved.

Satureia, savory—winter-savory.

Taxus, yew-tree—common yew-tree—short-leaved—variegated-leaved.

Thuja, *Arbor Vitæ*, or tree of life—common arbor vitæ—Chinese arbor vitæ—American sweet-scented—variegated.

Viburnum, *Laurustinus*—common laurustinus—broad-leaved—hairy-leaved—shining-leaved—white-striped-leaved—yellow-striped-leaved.

Ulex, furze, gorse, or whins—common wild furze—white-flowered—long narrow-spined—short-spined—large French furze—dwarf-furze.

All the above list of Evergreen trees and shrubs are so hardy, that they prosper in almost any common soil and situation; several of the large sorts may be employed both as forest-trees, and for ornament; and the sorts in general are choice furniture for all kinds of shrubbery works; which, for the general part, should be stationed in clumps or plantations by themselves, and not too generally intermixed with trees of the deciduous tribe, or only thinly disposed, here and there one, in a conspicuous order, to effect the greater variety, and, in some degree, to give a more lively appearance to the particular plantations in winter, by their continuing verdure, when the deciduous kinds are devoid of foliage; but they have a fine effect when they are stationed in clumps alternately with those of the deciduous kinds, either on the boundaries of grand lawns, or any other principal part of pleasure-grounds, parks, or fields, or sides of hills, &c.

These plants, both of the tree and shrub kind, in all plantations, whether in small or large clumps, or in any running shrubbery works, should all be suffered to retain their natural growth, only just to cut out or shorten any very rambling or irregular shoot or branch, and broken and decayed wood.

Formerly hedges of Evergreens were in

great estimation for purposes of ornament; and some sorts were also of much utility, trained in hedges for fences and shelter, &c. And Evergreens were in great repute in the ancient style of gardening, for effecting various devices in rural imitations of architectural designs, both in the hedge order, and other arrangements, forming cabinets, pavilions, porticoes, pilasters, niches, domes, arcades, cornices, pediments, amphitheatres, and many other similar imitations, as well as in various detached figures, as pyramids, globes, columns, &c. and which were often so arranged and curiously trained as to exhibit an air of grandeur and art in that peculiar branch of gardening; but since the more rural or natural imitations in horticultural designs have so greatly prevailed, most of these formal works both in the hedge-order, and the various fancy-devices of the above kinds, are almost wholly abolished from the English gardens; though, as before noticed, hedges of some particular sorts of Evergreens might be admitted occasionally, both usefully and ornamentally, such as in the manner of fences, and by way of shelter to particular districts, and, being always in verdant foliage, will have an ornamental appearance at all seasons.

The most eligible Evergreens for any principal garden-hedges are chiefly holly and yew; both of which, being closely branched from the bottom upward, form thick, close, substantial hedges, well adapted, either as fences, or to divide, inclose, or form shelter to any particular compartments; though, for an outward hedge-fence, the holly is superior, on account of its defensive thorny armature, with which all the leaves are amply furnished, rendering it a very formidable hedge, almost equal to quick or hawthorn, against the incursions of men and beasts; and the leaves, being of a shining green, show always a lively appearance; however, both these sorts were formerly in universal estimation, and the most generally adopted as principal Evergreen hedges, they growing very close and firm as always to retain their proper position.

But several other sorts of Evergreens admit of being trained in neat pretty hedges, in a secondary degree, as it were, for variety, ornament, and other designs, in pleasure-grounds; such as phillyrea, alaternus, laurel, laurustinus, Evergreen-privet, bay tree, Evergreen oak, box-tree, sea-purslane-tree, juniper, Virginia cedar, rosemary; but more generally the first five or six sorts; though, in former gardening, when hedge-work was greatly predominant, all the sorts were occasionally employed in that order; some principally for variety

variety and ornament, others by way of internal fences, or to inclose particular compartments, and some as divisional hedges, &c. but of the whole, the laurel, in particular, forms a most beautiful, and, if required, a lofty Evergreen hedge, of a noble appearance, in its luxuriant shining foliage.

And of the above-mentioned sorts, some admit of being trained hedge-fashion, or in a handsome spreading order, to cover any naked wall, paling, or any unsightly fence of that kind: and for which occasion the following sorts are the most properly adapted: phillyrea, alaternus, laurel, laurustinus, bay, pyracantha; which sorts, being planted close to the fence, and their branches trained thereto in a spreading manner, will form a close growth, and effectually answer the intention very agreeably in constant verdure, summer and winter, in their continuing leaves. Or the laurel is also well adapted to plant on similar occasions, in a more extensive degree, if required, to cover any disagreeable appearance, either in open or shady places, as it will prosper in almost any situation, or even under the shade of other larger trees; and for this purpose, it may either be permitted to run up rough, or advance mostly in its natural growth, or occasionally trained to some regular order, as thought most eligible, whereby to effect the purpose intended: the pyracantha, although sometimes trained against walls, is not so well adapted for completely covering any considerable extent as the other above named sorts, is more generally applicable to occupy some moderate space, principally for variety and ornament of its beautiful red berries in autumn and winter, and for which is frequently trained against the front part of a dwelling, or some conspicuous wall or building, or introduced in assemblage for the above occasion.

All hedge-work, &c. of the above kind in Evergreens, should generally be regularly clipped once a year, generally in summer or early in autumn; but to continue them in perfect neat order, that operation would be eligible twice in that season, the first cutting in June, and the second about the middle or latter end of August.

The propagation of Evergreens is effected by several different methods, as by seed, layers, cuttings, suckers, &c. as is fully explained for each sort under its respective genus; performed mostly in the spring, or sometimes in autumn, in September and October; but the more general part in the spring, in March and beginning and middle of April, or occasionally some sorts in summer, by cuttings and layers of the young shoots of the same season, which

often, in particular hard-wooded sorts, strike root more freely than in the older wood.

The season for planting Evergreens is autumn and spring; but the autumn planting should generally be performed early in that season, that is, from about the middle or latter end of September, to the end of October or November at latest, before the approach of frost; for Evergreens should not be too generally transplanted after the above-mentioned seasons, as, if severe frost or sharp cold weather set in before they strike fresh root, it would greatly injure many sorts; and, therefore, it would be more advisable to perform the principal planting in the spring, in March and early part of April.

Any necessary pruning in Evergreens should be performed either in the advanced part of the spring, latter end of March, April, or May, or, occasionally, in any of the summer months, or early part of autumn, not later than September or beginning of October, and never any general pruning in winter, or after the commencement of cold weather, especially any close cutting, to expose the interior parts suddenly to the cold, which, in most sorts, would affect the young shoots and leaves, and occasion the foliage to change brown, and assume a disagreeable appearance all winter: though the cutting or shortening any particular rambling shoot or branch will not materially affect them; only to avoid any considerable close cutting in that season.

Likewise the clipping of Evergreen hedges should be effected principally in summer and early part of autumn: never clip them in winter or too early in the spring; for if the cold of those seasons is suddenly admitted, by close cutting in the outer shoots, it would change all the leaves to a rusty brown colour, as before observed, that the hedge would have a very disagreeable aspect for a long time after, till covered with young shoots and leaves in fresh production; so that any principal clipping of Evergreen hedges should not be commenced before May; or, if the hedge was properly clipped the preceding summer, June or July is time enough to begin that work; and should generally be wholly finished in August, or early in September, before the setting in of cold weather.

EUONYMUS, Spindle-tree.

This genus furnishes two hardy deciduous and evergreen flowering shrubs for the shrubbery, of ten or twelve feet stature, ornamented with simple leaves, and bunches of small pentapetalous white flowers.

Class and order, *Pentandria Monogynia*.

Characters.] CALYX is monophyllous, and

five-parted. COROLLA, four or five oval, plane, spreading petals. STAMINA, five short filaments, and twin antheræ. PISTILLUM, an acuminated germen, short style, and obtuse stigma. PERICARPIUM, a succulent, pentagonous, quinquangular, quinquelocular, coloured capsule, having one oval seed in each cell.

The principal species and varieties are,

1. *EUONYMUS Europæus*.

European deciduous Spindle tree.] *Euonymus* with an upright woody stem, dividing into many branches, rising ten or fifteen feet high, garnished with oblong opposite leaves; and from the sides of the branches, small bunches of greenish quadrid flowers, succeeded by pentagonous capsules, disclosing their granulous red seeds in a beautiful manner in autumn.

Varieties.] Narrow leaves and deep red berries—with pale red berries—with white berries—with broad leaves—with variegated leaves.

2. *EUONYMUS Americanus*.

American Ever-green Spindle-tree.] *Euonymus* with a shrubby stem, dividing into many opposite branches, rising six or eight feet high; garnished with spear-shaped, evergreen leaves, growing opposite; and from the sides and ends of the branches, small clusters of quinquid, whitish flowers, succeeded by roundish, rough, protuberant capsules, seldom ripening seeds in England.

Variety.] With variegated leaves.

Both these species and varieties are hardy, and succeed in any common soil and exposure.

The first grows wild in hedges and woods in many parts of Britain, and other parts of Europe, but has been long an inhabitant of gardens, esteemed for the ornamental appearance of its seeds: particularly the red sorts, in October and November, when the capsules spread open, and expose the berry-like seeds, form a fine variety; the branches of which being used for making skewers and spindles, derives the name Spindle-tree.

The second is of American growth, and is a very pretty evergreen, for any ornamental plantation.

Propagation of both Species.

The *Euonymus Europæus*, and varieties, may be propagated plentifully by seeds, layers, and cuttings.

By Seed.—Sow it in a bed or border of common earth, in October or November, covering with earth near an inch deep; and the plants will rise in spring following, though sometimes many of them not till the second

spring; keep them clear of weeds till autumn, then transplant them in nursery-rows, and in two or three years they will be of due size for the shrubbery.

By Layers.—Lay down the young shoots in autumn or winter, or early in spring, giving them a slit at a joint, and they will be rooted by autumn following.

By Cuttings.—In autumn take off cuttings of the young shoots eight or ten inches long, plant them in a shady border, and they will be rooted in one year.

Either of the two latter methods, or budding, or grafting, are the only certain way of continuing the varieties, which vary from one to the other by seed.

The second sort, and variety, is propagated chiefly by layers of the young branches in autumn, giving each a slit, and they will be rooted and fit to transplant by that time twelvemonth.

EUPATORIUM, Hemp Agrimony.

Of this genus are several herbaceous flowery perennials for the pleasure-ground, producing annual stalks from two to four or five feet high; adorned chiefly with simple leaves, and terminated by clusters of compound flowers.

Class and order, *Syngenesia Polygamia Æqualis*.

Characters.] CALYX, a scaly, imbricated, general cup. COROLLA, several funnel-shaped, hermaphrodite florets, five-parted, and spreading at the brim. STAMINA, five filaments, and cylindric antheræ. PISTILLUM, a small germen, long bifid style, and narrow stigma. PERICARPIUM, none. SEMEN, an oblong downy seed under each floret.

1. *EUPATORIUM cannabinum*.

(Hemp Eupatorium)—or Common European Hemp Agrimony.] *Eupatorium* with upright reddish stalks, three feet high, fingered-leaves, having oblong, indented lobes, and the stalks terminated by large clusters of pale-red flowers.

2. *EUPATORIUM maculatum*.

Spotted-stalked American Eupatorium.] *Eupatorium* with upright dark purple-spotted stalks two feet high, garnished with spear-shaped, equally serrated, rough leaves by fives, and the top terminated by a corymbose cluster of purplish flowers.

3. *EUPATORIUM aromaticum*.

Aromatic White Pennsylvanian Eupatorium.] *Eupatorium* with upright stalks three feet high, oval-obtuse, trinervous, serrated leaves, and the stalks terminated by corymbose clusters of white flowers.

4. *EUPATORIUM purpureum*.

Purple

Purple Canada Eupatorium.] *Eupatorium* with upright stalks four feet high, garnished with long, spear-shaped, unequally serrated, rough leaves by fours, and terminated at top by clusters of purple flowers.

5. *EUPATORIUM altissimum.*

Highest Pennsylvanian Eupatorium.] *Eupatorium* with upright, ligneous stalks, four or five feet high, garnished with very long, spear-shaped, nervous, slightly-sawed leaves, and terminated at top by corymbose clusters of white flowers.

6. *EUPATORIUM perfoliatum.*

Perfoliate Virginia Eupatorium.] *Eupatorium* with upright stalks three feet high, garnished with long rough leaves, connected at their base, and perforated by the stalk, which is terminated by clusters of white flowers.

All these plants have perennial roots, and annual stalks, rising in spring, flower in July and August, and produce ripe seed in autumn; the first grows wild in England, by water-sides, but all the others are of American growth, and they are very hardy.

They are proper furniture for the compartments of large pleasure-grounds, to increase the variety of flowery perennials, and will succeed any where, but delight most in moist shady places.

Their propagation is by seed, and by parting the roots in autumn or spring.

Sow the seed on a bed or border of common earth, either on the surface and raked in, or in shallow drills half an inch deep; and when the plants are two or three inches high, prick some of them out five or six inches apart, to stand till autumn, then transplant them where they are to remain.

By parting the roots.—The roots furnish off-sets plentifully, which may be separated in autumn, and planted out separately, either into nursery-beds for a season, or at once in the places where they are to stand.

Their principal culture is the keeping clean from weeds, digging about them annually, and cutting down the decayed stalks in autumn.

EUGENIA, (Eugenia).

Consists of tree-kind exotics of Indian growth, for the hot-house, having oblong, entire, and crenated leaves, and tetrapetalous flowers, in bunches and singly.

Class and order, *Icosandria Monogynia.*

They are shrubby of upright growth; the leaves mostly oblong, in some species entire, in others notched; and large flowers at the sides and ends of the branches; having a monophyllous, quadrifid cup, a corolla of four oblong-obtuse petals; twenty or more stamina; a

turbinate germen, supporting a single style, succeeded by peach-shaped, succulent, unilocular fruit, including a roundish nut, and produced principally in the Indies, where it is eatable.

The principal species are,

1. *EUGENIA malaccensis.*

Malacca, eatable fruited Eugenia.] With entire leaves, and branching flower-stalks at the sides and ends of the branches.

2. *EUGENIA Jambos.*

(Jambos)—or Wild Indian Eugenia.] With entire leaves, and branching flower-stalks terminating the branches.

3. *EUGENIA uniflora.*

One-flowered Eugenia.] With heart-spear-shaped entire leaves, and lateral peduncles having each one flower.

4. *EUGENIA acutangula.*

Acute-angular-fruited Eugenia.] With oblong crenated leaves, terminal peduncles of flowers; and oblong, acute-angled fruit.

5. *EUGENIA racemosa.*

Racemous-flowering Eugenia.] With oblong crenated leaves; long, racemous clusters of flowers; and egg-oval, quadrangular fruit.

All these species of *Eugenia* are natives of the hot regions of India; and are retained in this country in some curious stove collections for variety; and are propagated by the stones or nuts of the fruit, obtained from the Indies, and must have the aid of a hot-bed or bark-bed; also sometimes by layers.

EUPHORBIA, Spurge, or Burning Thorny Plant.

This genus comprises many shrubby and herbaceous succulents, mostly tender exotics, for the stove and green-house; consisting chiefly of thick, fleshy, succulent stalks and branches, frequently armed with thorns, obtaining in stature some ten or twelve feet, others scarce so many inches, of various singular growths, often entirely devoid of leaves, and with quadripetalous, close-fitting flowers.

Class and order, *Dodecandria Trigynia.*

Characters.] *CALYX* is monophyllous, ventricose, four or five-parted, and persistent. *COROLLA*, four or five thick truncated petals. *STAMINA*, twelve or more filaments, and globular, didymous antheræ. *PISTILLUM*, a roundish, trigonous germen, three styles, and obtuse stigmas. *PERICARPIUM*, a roundish, trilocular capsule, and three roundish seeds.

The species are numerous: those chiefly cultivated in the English gardens are,

1. *EUPHORBIA antiquorum.*

Euphorbia of the Ancients.] *Euphorbia* with an upright, triangular, succulent, perennial stalk, rising six or eight feet high, armed with

crooked spines, and emitting on every side many triangular, irregular, spreading branches, having at their extremities roundish leaves that soon drop off, and sometimes a few whitish flowers.

Variety.] With upright, three and four-angled, jointed, very thorny stalks, and erect branches,—(*Trigonum.*)

2. *EUPHORBIA neriifolia.*

Oleander-leaved Euphorbia.] Euphorbia with an upright, strong, succulent, angular stalk, set with oblique tubercles, branches out near the top, and grows five or six feet high; the branches armed with crooked spines, and garnished with roundish, deciduous leaves, succeeded by greenish-white close-sitting flowers.

3. *EUPHORBIA canariensis.*

Canary leafless Euphorbia.] Euphorbia with an upright, four or five-angled, succulent, perennial, green stalk, branching out strongly all around, armed with spines by pairs, and all the branches turning upward towards their extremities; no leaves, but small whitish flowers at the ends of the branches.

4. *EUPHORBIA officinarum.*

Officinal Euphorbia.] Euphorbia with several many-angled, succulent, perennial stalks from the bottom, emitting irregular horizontal branches, gradually turning upward, armed with spines, and from the upper parts, greenish-white flowers.

5. *EUPHORBIA Tithymaloides.*

(*Tithymaloides*)—or *Myrtle-leaved Bastard Spurge.*] Euphorbia with shrubby, slender, succulent stalks and branches; rising eight or ten feet high, oval acute-pointed leaves, ranged alternately on two sides of the branches, and from the end of the branches several scarlet flowers.

Variety.] Laurel-leaved bastard spurge—and with variegated leaves.

6. *EUPHORBIA Caput Medusæ.*

(*Caput Medusæ*)—or *Medusa's-Head Euphorbia.*] Euphorbia with thick, roundish, succulent, scaly stalks, roundish scaly branches, twisting over one another, appearing like many-headed serpents, narrow, thick, succu-

lent leaves, and from the upper parts of the branches, white, close-sitting flowers.

Varieties.] Little Medusa's-head, having a short stalk, six or eight inches high, and slender trailing branches, twisting over one another—dwarf-trailing Medusa's-head, with swelling scales—low spreading Medusa's-head, without scales—deciduous, low spreading Medusa's-head, with leaves falling soon off—double-branching, low, spreading Medusa's-heads.

All these species of Euphorbia are very succulent in stalks and branches, abounding with a milky juice, so extremely acrid, as to burn linen, or blister the hand or any part of the skin, where applied; and the branches being so succulent, cuttings thereof, if preserved dry, may be kept out of the ground several months if necessary; and then planted, will readily emit roots and grow.

They are all natives of the hot parts of Africa, Asia, and America, and retained here in our stoves, as plants of curiosity, for the great singularity of their strange growth.

In their culture here, they must be kept always in pots of very light, sandy, or rubbishy poor soil, and placed upon the shelves in the hot-house.

They are all easily propagated by cuttings of their branches any time in summer; take off the cuttings with a knife, from three to five or six inches long; lay them on a dry shelf till the wound is dried up and skinned over, as for other succulent cuttings; when this is effected, plant them singly in small pots of dry sandy soil, and plunge them in the bark-bed; give a little water once or twice a week, and they will soon be well rooted, and may then be placed upon the shelves in any part of the stove.

They must be allowed larger pots occasionally, once every year or two, but never put them in any too large; waterings will be necessary now and then, which in winter once a week is sufficient, and not oftener than twice in spring and autumn, and about two or three times a week in the heat of summer.

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FAGARA.

A genus of stove exotics, garnished with winged leaves and cruciform flowers.

Class and order, *Tetrandria Monogynia.*

Characters.] CALYX, a small quadrid cup. COROLLA, four long, concave, spreading, permanent

permanent petals. STAMINA, four filaments longer than the corolla, topped with oval antheræ. PISTILLUM, an ovate germen, slender style, crowned with a two-lobed stigma. PERICARPUM, a globose, bivalve capsule of one cell, containing a round shining seed.

The species are,

1. FAGARA *Pterota*.

Lentiscus-leaved Fagara.] Fagara with emarginated leaves.

2. FAGARA *Tragodes*.

Prickly-leaved Fagara.] Fagara with spines at the joints under the leaves.

The first species rises with a woody stem, sending out branches garnished with small winged leaves; the flowers come out from the sides of the branches, on short foot-stalks, four or five together.

The second species rises with a woody stem, with branches garnished with winged leaves, and spines at their joints; the flowers are produced from the sides of the branches, as in the first species.

Both sorts must be kept constantly in the bark-pit of the stove, and are propagated by sowing the seeds in pots, and plunged in a hot-bed, and afterwards managed as other stove plants of the like nature.

FAGUS, the Beech-tree, and the *Castanea*, or chestnut tree.

This genus retains three hardy, deciduous trees, two of them of large and beautiful growth, valuable to cultivate for timber, and for ornamental plantations; the other is a dwarf shrub-like tree for the shrubbery, all of them adorned with beautiful simple foliage, and monœcious amentaceous flowers.

Class and order, *Monœcia Polyandria*.

Characters.] Male and female flowers on the same tree, collected into globular and cylindric amentums, having monophyllous cups, five-parted in the males, and four in the females. COROLLA none. STAMINA, many filaments in each cup, and oblong antheræ. PISTILLUM, a germen, three styles and simple stigmas. PERICARPUM, a large, roundish, spinous capsule, formed of the calyx, containing two nuts.

The species are,

1. FAGUS *sylvatica*.

Wood, or Common Beech tree.] Fagus, with an upright, straight, smooth trunk, rising sixty or seventy feet high, and of proportionable bulk, branching upward into a fine regular head, garnished with oval, slightly serrated leaves; flowers in globular catkins, succeeded by angular fruit called mast.

Varieties.] With yellow striped leaves--white striped leaves--with dark-purplish leaves.

2. FAGUS *Castanea*.

(Castanea)—or the *Chestnut-tree*.] Fagus, with an upright large trunk, growing forty or fifty feet high, branching regularly around into a fine spreading head, garnished with large, spear-shaped, acutely serrated leaves, naked on the under side, flowers in long amentums, succeeded by round prickly fruit, containing two or more nuts.

Variety.] Gold striped-leaved chestnut-tree.

FAGUS *pumila*.

Dwarf American, or Chestnut-tree Chinquepin.] Fagus, with a shrub-like stem, branching eight or ten feet high, oval, spear-shaped, acutely serrated leaves, hoary on the under side.

The flowers of all these trees are very inconsiderable in appearance; those of the beech-tree are collected into roundish heads appearing in May and June, succeeded by the mast, an angular fruit, in autumn; and the flowers of the two species of chestnuts are gathered into long catkins, appearing in May, succeeded by the nuts in autumn, in large, round, prickly covers, each containing one, two, or more nuts.

The first two species may be ranked with the first class of timber trees, both for their ornamental appearance when growing, and their various uses when felled as timber; no trees are more suitable for parks, extensive lawns, large wilderness works and clumps, or on the sides of woods, fields, avenues, and by the sides of large ridings; that besides their ornamental appearance when growing, and expectation of their valuable timber, they afford a plentiful annual crop of fruit for swine, deer, and other animals; and the fruit of the chestnut tree is often eaten at table, and is greatly esteemed by many when roasted; the fruit do not however, always arrive at such perfection here as in Spain, from whence great quantities are annually sent hither in winter.

The beech was formerly much employed to form hedges, to surround the quarters of the pleasure-grounds, according to the ancient mode of dividing the ground into regular squares, angles, &c. it forms a very handsome hedge, when neatly sheared twice every summer, i. e. about Midsummer, and again in August.

The timber of those trees is valuable for many purposes; that of the beech is esteemed by the turners, as also by joiners, for making bedsteads, chairs, stools, dresser-boards, coffins, &c. and as to the chestnut, the uses of its timber are almost universal, not only for building, but for many other strong purposes, as well as for making fine tables.

tables, chairs, bedsteads, &c. and all sorts of vessels to hold liquor; as under-wood, it is also superior for poles for hops, and various other uses.

As to the dwarf chestnut, it is only employed for variety in shrubberies, and other ornamental plantations.

All the sorts will thrive on almost all soils and situations, in sandy, gravelly, loamy, or clayey land, either on plains, declivities, or sides or tops of hills.

Propagation and Culture

First of the beech tree.—This is easily raised from the mast or seed, which ripens abundantly in September, and which may either be sown then, or in a month or two after, or towards spring; for which prepare beds four feet wide, and raking the earth evenly from off the surface, about an inch deep, then sow the mast, and beat it gently down with the back of the spade, and cover it over with the earth the above depth; in spring many plants will come up, others not till a year after, and when they are two years old, plant them out in nursery rows, two feet and half asunder, by a foot to eighteen inches in the rows, to remain till they are four or five feet high, or more, and then may be transplanted, where they are to remain.

Second, the chestnut tree.—This tree is also propagated by seed, i. e. the nuts, which sometimes ripen perfectly in England; but in default of this, there are vast quantities imported annually from Spain and Portugal, which are rather preferable, either of which are to be preserved in sand till February, then sow them in drills: let the drills be made a foot asunder, and two or three inches deep, in which place the nuts two or three inches distance, and earth them over; they will soon germinate, and come up freely the same spring: all the culture they require, is to be occasionally hand-weeded; and when two years old, transplant them in February in nursery rows, at which time, previous to planting, shorten their roots and trim off all side-shoots, then plant them in lines two feet and half distance, and half that distance in the rows; and after having four or five years' growth, they will be of due size to plant out for good, either for ornamental plantation, or as forest trees.

Both the above tree kinds, Beech and common Chestnut, may be cultivated to great advantage as principal forest or timber trees, both to grow up for large timber standards, and in underwood, to cut in young growth every seven, eight, or ten years; and may be cultivated in almost any soil and situation, not marshy wet, either by planting young plants

raised as above in a nursery, or by the mast and nuts, sown at once to remain, in drills five or six feet asunder to allow of thinning in underwood aforesaid, to cut for poles, &c. or if by young plants, they may be planted the same distance, to admit of thinning as above observed, when of seven or eight to ten or twelve years' growth, cutting them down within a foot of the ground, leaving a sufficiency of the most promising at twenty feet distance, to grow up for timber. See FOREST TREES.

The common Chestnut, as a fruit tree, for its production of nuts, is not of any considerable merit in this country, as the nuts do not always ripen in tolerable perfection in size and flavour, as those imported here every year from Spain and Portugal; however, some might be planted as fruit trees towards the boundary of large orchards, arranged in avenues, parks, hedge-rows, and any out-grounds, forty or fifty feet asunder, or disposed in clumps of three, four, or five trees, the same distance; or some dropped singly in parks, and spacious open lawns; they, though swift growers, seldom begin bearing till of some considerable growth, when they sometimes produce vast quantities of nuts, ripe about September.

The dwarf-chestnut, or chinquepin, is also raised from the nuts, which are procured from America by the seedsmen, and are to be planted in drills, and managed in every respect as the common sort.

The variegated-leaved kinds are continued by budding, grafting, or inarching in stocks of the common sorts.

FEMINEUS *flos*, a Female Flower.

A Female Flower, according to the sexual system, is that which is furnished only with the *pistillum*, or female organs of generation, i. e. the germen, style, and stigma, but wants the stamina, or male organs altogether.

They, the Female Flowers, are produced apart from the males either on the same plant, as in cucumber, melon, gourd, mulberry, and other plants of the class *monœcia*; or on distinct plants, as in all the genera in the class *diœcia*. See CLASSIS.

FEMINEA *planta*, a Female Plant, a plant which produces female flowers only, as spinach, hemp, poplar, juniper, *menispermum*, *myrica*, and other genera of the class *diœcia*.

FERRARIA.

This genus consists of an herbaceous plant for the green-house, remarkable for the singularity of its flowers.

Class and order, *Gynandria Triandria*.

Characters.] CALYX, a carinated, involute, unilobed spatha. COROLLA, six spotted

ted petals, waved and curled, three of which are alternately broader. STAMINA, three curved filaments, topped with oval antheræ. PISTILLUM, an oblong, three-cornered germen supporting a slender style, crowned with cucullated stigmata. PERICARPIUM, an oblong, three-cornered capsule, containing in three cells numerous roundish seeds involved in a pulp.

The species is,

FERRARIA undulata.

Curled-flowered Ferraria.] *Ferraria* with a many-flowered stem.

The roots of this plant are tuberous, from which arise several stalks garnished with long nervous leaves embracing the stem alternately; the flowers which arise from each sheath are of a singular construction, their edges very much curled and wrinkled and of a dark purple colour; they are of short duration, but when the plant is strong many blossoms arise in succession.

It flowers in the spring, and may be propagated by off-sets, which its bulbs produce in tolerable plenty, and requires the same treatment as other green-house bulbs. There is another species with sword-shaped leaves, and smaller, less-fringed flowers; its culture is the same as the other sort.

FERULA, Fennel-giant.

The plants are large, herbaceous, flowery perennials, producing annual stalks eight or ten feet high, terminated by yellow umbels of flowers.

Class and order, *Pentandria Digynia*.

Characters.] CALYX, umbellate flowers, having a caducous general involucre, and a many-leaved partial one, and scarce any calyx to the florets. COROLLA, a globular general umbel, composed of many quinquepetalous florets. STAMINA, five filaments and single antheræ. PISTILLUM, a turbinate germen, two styles, and obtuse stigmas. PERICARPIUM, an elliptical, plane, two-parted fruit, and two seeds.

The principal species are,

1. *FERULA communis.*

Common Fennel-giant.] *Ferula* with long, thick, juicy roots, crowned by very long many-parted leaves, composed of numerous very long, narrow, undivided segments, spreading widely on the ground, upright, strong, jointed, hollow stalks, ten or twelve feet high, garnished with divided leaves, and terminated by roundish umbels of yellow flowers.

2. *FERULA Ferulago.*

(Ferulago) — or *Pinnatifid-leaved Sicilian Fennel-giant.*] *Ferula* with long, thick, juicy roots, crowned by long pinnatifid leaves, of

numerous plane three-parted segments, spreading widely on the ground; upright, strong, jointed, hollow stalks, seven or eight feet high, terminated by roundish umbels of yellow flowers.

Of the juice of the roots of them is prepared the drug *galbanum*.

3. *FERULA tingitana.*

Tangier shining-leaved Ferula.] *Ferula* with very thick juicy roots, crowned by many-parted, shining leaves, composed of numerous jagged unequally three-parted segments, spreading widely on the ground; upright, strong, hollow stalks, eight or ten feet high, terminated by large umbels of yellow flowers.

4. *FERULA glauca.*

Glaucous Fennel-giant.] *Ferula* with a thick juicy root, crowned by large many-parted glaucous or grey leaves, of many narrow, plane segments, upright, strong, jointed, hollow stalks, six or eight feet high, terminated by yellow umbels.

All these species of *Ferula* have thick, fleshy, perennial roots, spreading and penetrating deep into the ground, leaves spreading widely around; and stalks an inch and half thick, are perennial in root, but annual in leaf and stalk, which rise in spring, flower in June and July, ripen seeds in September, and decay soon after.

They are proper furniture for the large compartments of extensive pleasure-grounds; they will grow any where, but grow tallest and strongest in deep soils.

Their propagation is effected by seed, in autumn or spring, in drills twelve inches asunder, sowing it thinly, and cover it near an inch deep, and when the plants are a year old, transplant the largest into the places where they are to remain.

FICUS, the Fig-tree.

The common fig-tree of our gardens consists only of one species, very comprehensive in the varieties of its fruit, is of the deciduous tribe, moderately hardy, producing fruit in great perfection against walls, also tolerably in espaliers and standards; but besides this sort, there are several other tender exotic species, sometimes retained in our hot-houses, for variety; we shall however first exhibit the culture of the common kind.

Class and order, *Polygamia Triaxia*.

Characters.] CALYX, androgynous, male, and female flowers upon three distinct plants, included in great numbers of small florets within the fruit, which serve as a general calyx, or receptacle, each floret having, in the males a three, and the females a five-parted cup. COROLLA, no petals to the florets. STAMI-

NA,

NA, three bristly filaments in the males, and didymous antheræ. PISTILLUM, in the females, an oval germen, reflexed style, and two reflexed stigmas. PERICARPIUM, none; but the numerous seeds are lodged within the general calyx or receptacle, and which become the fruit.

The fruit of the fig-tree, in the general acceptation of the word, is the common calyx to the flowers, which are numerous very small florets, that line its internal surface, so that they are not visible without opening the fruit or common receptacle.

These flowers are in some trees female only, in others male, and some male and female within the same receptacle.

The species is,

Ficus Carica.

Common cultivated Fig-tree.] Ficus with an upright stem, branching fifteen or twenty feet high, garnished with large palmated or hand-shaped leaves.

The leaves are generally more or less divided into five principal parts.

This tree always produces its fruit upon the young shoots of the former year, rising immediately from the eyes of the shoots, appearing first like small buds, which increase gradually in size till July, August, and September, when they arrive at full growth; mostly large, somewhat pear-shaped, and as they approach to ripeness, the skin changes gradually from a greenish to bluish, purplish, blackish, whitish, or yellow colours in different varieties, full of a purplish, reddish, whitish, or yellow pulp, becomes very soft, juicy, and extremely rich and luscious, fit for immediate eating as gathered from the trees.

The principal *Varieties* of this fruit are,

Common Fig.—A large oblongish, dark, purple-blue fruit; the tree a great bearer, and ripens in great perfection in August, either on standards or walls.

Brown or Chesnut Fig.—A large globular, shortish, chesnut-coloured fruit, having a purplish delicious pulp; ripe in July and in August.

Black Ischia Fig.—A middle-sized, shortish, flat-crowned, blackish fruit, having bright pulp; ripe middle of August.

Green Ischia Fig.—A large oblong, globular-headed, greenish fruit, slightly stained through by the pulp to a reddish brown colour; ripe end of August.

Brown Ischia Fig.—A small pyramidal, brownish-yellow fruit, having a purplish very rich pulp; ripe in August and September.

Malta Fig.—A small flat-topped brown fruit; ripe the middle of August and September.

Round Brown Naples Fig.—A globular, middle sized, light-brown fruit, and brownish pulp; ripe end of August.

Long Brown Naples Fig.—A long dark-brown fruit, having a reddish pulp; ripe in September.

Great Blue Fig.—A largish blue fruit, having a fine red pulp.

Black Genoa Fig.—A large pear-shaped black-coloured fruit, and bright red pulp; ripe in August.

Brown Madonna or Brunswick Fig.

Black Provence Fig.

Divided-leaved Fig-tree.—having the leaves deeply divided into many narrow segments, valuable principally for the shrubbery for the variety of its leaves.

There are many other varieties; but it is unnecessary to recount them, some of them being nearly alike, and many of them will not ripen perfectly in our gardens.

Most of the above varieties of figs will bear plentifully against walls of a south, east, or west aspect, and will also bear very well in espaliers; they will likewise, in fine dry summers, produce tolerable good crops on standards, in a warm defended situation, and sunny exposure, either half standards, or dwarfs, and sometimes produce greater crops of fruit than those trained against walls.

Having remarked above, that in fig-trees, it is the year-old shoots only that produce the fruit, this however is often formed upon the shoots the preceding summer, appearing in autumn like very small buds, as aforesaid, at the places of the leaves; many also come out in spring, from which we are principally to expect our best crops. let it also be remarked, that in autumn after the main crop of ripe fruit is gone, you will generally see a secondary production of many green fruit remaining; quarter or half grown: these are such as are produced early upon the same summer's shoots, which in warm countries arrive also to perfection the same season; so that they have two crops annually, but these rarely ever attain perfection in England, unless assisted by hot walls, nor will they stand the winter to come to perfection the succeeding year; therefore all these sorts should be pulled off at the fall of the leaf in autumn.

Fig-trees are the most uncertain of any in producing good crops of fruit in England, their young shoots and fruit being both very liable to suffer by frost; for in some seasons the young shoots do not ripen or harden, but remain soft, pithy, and full of juice, and the winter frosts often kill their upper parts; in which case but little fruit can be expected the succeeding

succeeding summer, as the fruit is always principally produced towards the extremities of the shoots; therefore, to preserve the shoots in severe winters, some of the choicest sorts against walls may be matted during the inclemency of the weather.

It is the robust, short-jointed shoots that are the principal bearers; the long, straight, smooth shoots seldom bear much; the former sorts should therefore be chiefly retained for bearing. See their *Culture*.

All the varieties of these trees prosper in any common soil of a garden, prepared by common digging or trenching one or two spades deep.

They may be planted at fifteen or twenty feet distance, against walls and espaliers; and as standards, any distance not less than fifteen feet from one another.

Propagation.

The propagation of fig-trees is effected with great ease three different ways, viz. by suckers arising from the root, by layers, and by cuttings.

By Suckers.—The trees commonly send up many suckers annually in summer, which, in autumn or spring following, may be transplanted: in taking them off, go as low as possible to the old root; trim off any ragged part at bottom, leaving their tops entire, especially if for standards, and plant them in nursery lines, two or three feet distance; or may be planted at once, where you design they shall remain to produce their fruit; observing, if they are designed for dwarfs, for walls, or espaliers, they, if long, may be headed to six or eight inches in March, the more effectually to force out lateral shoots near the bottom, as observed of espalier and wall trees; but if intended for standards, they must not be topped, but trained with a stem, not less than fifteen or eighteen inches for dwarf-standards, a yard for half-standards, and four, five, or six feet for full standards, and then must be suffered to branch out to form a head; observing, that whether trained as wall, espalier, or standard-trees, the branches or shoots must not generally be shortened, unless to procure a necessary supply of wood, for the fruit being always produced upon the upper parts of the young shoots, if those are cut off, no fruit can be expected.

By Layers.—Autumn is the best season, though it may be done any time from October till March or April. Chuse the young pliable lower branches or shoots, of the most fruitful growth; lay them in the usual way, covering the body of the layers three or four inches deep in the ground, keeping the top entire, and as upright as possible; and they will be rooted,

and fit to separate from the parent in autumn; then plant them either in the nursery, or where they are finally to remain, managing them as ordered above for the suckers.

By Cuttings.—Autumn, at the fall of the leaf, or rather any time in March, is the time to plant them: chuse well ripened shoots of the preceeding summer, short, and of robust growth, from about twelve to fifteen inches long, having an inch or two of the two-years' wood at their base; the tops left entire, and plant them six or eight inches deep, in a bed or border of good earth, in rows two feet asunder: and when planted in autumn, it will be eligible to protect their tops in time of hard frost, the first winter, with any kind of long loose litter, managing them afterwards as the suckers.

Culture as wall and espalier trees.

Considered as wall and espalier trees, they should be allowed a sunny situation, being necessary to forward the ripening of the fruit, and promote a rich flavour: they ripen earliest in a full south exposure, but they will also succeed very well in an east and west aspect; and as to distance, fifteen or twenty feet is necessary; against a high wall the former distance is sufficient; but if the walls are rather low, twenty feet should be allowed.

With respect to training,—having headed down the first shoots, to procure bottom branches; as for other wall and espalier trees, the branches must be trained to the wall horizontally, preserving an equal number on both sides of the tree, ranging to the right and left, at six or eight inches distance, one above another; for the leaves being large, the branches should be laid wide accordingly, training each also at full length, for reasons before laid down, unless there is an immediate want of wood for an increase of branches, either to give the tree its first proper formation for the wall or espalier, or as a further supply to furnish the wall, &c. in which cases, some convenient shoots contiguous may be shortened to five, six, or eight inches, to force out laterals for the necessary supply; though these trees, for the general part, naturally furnish wood enough to render the work of shortening unnecessary.

For, as I before observed, these trees always producing their fruit upon the upper parts of the young wood, the branches should consequently, in the general course of culture, be always trained at full length, as shortening would cut away the only bearing parts, and force out innumerable unnecessary shoots; and it will be found that the trees seldom fail to furnish a natural supply of succession-

al young wood annually for each year's bearing; observe likewise, that in consequence of the trees bearing fruit upon the year-old wood only, particular attention is requisite to preserve an annual supply of each summer's shoots in every part of the tree, not only one at the extremity of every main branch, but likewise occasionally in the lower parts, quite from the bottom, coming up in successive order, one after another, at proper intervals, between all the principal branches; that every part of the wall or espalier may be occupied with bearing wood; and, as the lower young branches advance upward, the old naked ones that support scarce any young wood, or such, of a similar state, as are advanced too high for the wall, must be cut away either to their origin, or to some convenient young lower branch or shoot that they may support, training that up to supply the place of the part cut out. By observing as above, you will be able to have every part of your wall and espalier tree full of fruitful wood, quite from the bottom to top, and side extremities.

With respect to pruning, two principal dressings are requisite annually, to those against walls and espaliers, that is, a summer and winter pruning and training.

Summer Dressing.—The trees commonly produce great numbers of young shoots every summer, frequently many more than are necessary: some of the most irregular and ill-placed should be taken off, and the rest trained in close and at full length for next year's bearing, that by this regulation the sun and air may be more effectually admitted to promote the free growth and regular ripening of the fruit, the main object. June, July, and August, is the proper time for this work of summer dressing; and in that operation, I would advise to take off only such shoots that are very irregular, and such others that cannot be possibly trained in; for in these trees, it is proper to retain an abundant supply of good shoots in summer, where practicable, three times more than may seem necessary for the winter or spring training, because the shoots being rather of a succulent, pithy nature, many of them are often killed in winter; so that by reserving them all till the general pruning in spring, there may be a sufficiency to chuse from, to furnish the tree; and if more than necessary, they are easily cut out: therefore, in this dressing, take off principally only the most ill-placed fore-right and other very irregular, and evidently useless shoots, rubbing or cutting them off quite close; let all the others be trained to the wall or espalier, between the main branches

at full length, still continuing them so, as they advance.

Observe however, in the summer dressing, that if there is any great want of wood in any part, you may in June pinch or top any contiguous young shoot, whereby it will furnish a supply of collaterals the same season, to supply the vacancies.

If the above operation of summer dressing is begun early, before the shoots become woody, the redundant young wood may be rubbed off without employing a knife; but in a more advanced growth, the knife must be constantly used in displacing the improper shoots.

Winter or general Pruning.—Having observed above, that many of the young branches of Fig-trees are liable to be more or less damaged in severe winters, in consequence thereof it is advisable to defer this general pruning till spring, reserving till then all the shoots retained in the summer dressing; and out of the whole, enough may escape the frost for our purpose; and if more than enough, the better, as there will be the more to chuse from; but if the general pruning was performed in autumn, or early in winter, and no more shoots left than what is just necessary to furnish the wall or espalier, and many of these should be destroyed by the inclemency of the weather, there is no reserve left to supply the deficiencies; I would therefore advise the general pruning to be deferred till February or March.

This work of winter pruning consists of regulating the branches in general, old and young, taking out any very crowding and naked old branches, thinning and selecting the proper supply of young shoots, cutting out all weak and ill-ripened ones, and all dead wood.

With respect to the regulation of the principal branches, these should be about six or eight inches distance; if they anywhere have been trained considerably closer, they should now be thinned, and the contiguous ones all unnailed, that the whole may be trained regular at the proper distance; at the same time examine if there are any old naked branches, i. e. such as have advanced a considerable length, without furnishing hardly any proper bearing shoots, or young branches furnished with such; and that, provided there is proper young wood favourably situated to supply their place, such casual naked branches should be occasionally cut out at this pruning, to the place from whence they proceed, or at least down to the first best young shoot or branch, cutting them quite close, never leaving any stump: so retaining the proper branches and shoots in the place of the old wood now cut away;

away; having particular attention that every branch terminates in a young shoot, either arising immediately from its extremity; or, in default thereof, or that the end of the extreme shoot is dead, or that the branch is too long for its allotted space, it may be shortened to the next first, second, or third good shoot below, if any, as shall seem convenient, leaving each shoot at full length, unless its end is dead, when it must consequently be cut down to the live wood.

From the principal branches, pass to the supply of young wood, produced and trained in the preceding summer, of which, if they have escaped the frost, there will be probably many more than is necessary now to be retained; and keeping in view, as we formerly hinted, that they are the only bearers, and a proper supply must be trained now for next summer's fruit: every branch must not only terminate in one at full length, by the rules elucidated above, but collateral ones should also be retained, some towards the bottom of the branches, others near the middle, and some more towards the extreme parts, &c. advancing at proper distance one after another, as it were in successive order, between the principal branches; and that besides the supply of fruit they will thus furnish in every part, you will also have your wall or espalier so regularly filled with advancing young branches, that, as old branches become naked, or too extensive for the space of walling or espalier allotted, as may be the case in some part or other of the tree every season, there is always a resource of these young branches coming up gradually to succeed them; therefore at every general winter or spring pruning, select in the different parts of the tree, as above, a proper supply of the best shoots, such as are robust, and their buds near together, and arise from the upper or under sides of the main branches convenient for training in; at the same time cutting off all long foreright and other ill-placed ones, and all others, however good, that are redundant or superfluous, cutting every thing quite close to the surface of the branches, leaving all the selected shoots at full length, where practicable, for the reasons already assigned; never shortening any, only in case of dead parts, or want of an immediate further supply of shoots in any part to fill a vacancy.

Having therefore finished this general pruning, let all the branches and shoots be fastened in regular order to the wall or espalier, each at full length, and as straight as possible, preserving all the main branches six or eight inches distance.

Their Culture as Standard Trees.

Standard Fig-trees, whether dwarfs or half or full standards, after being trained to their proper form, as already directed in the article of propagation, may be planted in the borders or other compartments of the kitchen-garden, or in the pleasure-ground, generally in a somewhat shielded situation and sunny exposure, detached from other trees, and planted not nearer than fifteen or twenty feet to each other.

As to culture, they, in standards, require very little training or pruning: all that is necessary, is only taking out any very irregular branch, or, when their general branches are too much crowded, to thin them discretionally, taking out the worst and most irregular growing; observing also the same of the young shoots, where they are greatly crowded, thin out some of the ill-placed ones, and such as are weak and ill-ripened, and casual dead wood; observing, that the shoots and branches are always to be left entire, except in cases exhibited in the wall and espalier culture, as that of cutting off the dead end of shoots, &c. and thus they will often bear plentifully, and, if a warm autumn, ripen their fruit frequently in as great perfection as against walls.

The tender Species of Ficus.

These are preserved in some of our hot-houses, by way of curiosity, viz.

2. *Ficus religiosa.*

Sacred Indian Fig-tree.] Ficus with a woody stem, branching twenty or thirty feet high, heart-shaped, entire leaves, ending in long acute points.

This is held in great veneration in India, where it is called the religious tree.

3. *Ficus Sycomorus.*

(Sycomorus,)—or Mulberry-leaved Egyptian Fig-tree.] Ficus with a robust stem, branching twenty or thirty feet high, and large, roundish, heart-shaped, entire leaves.

4. *Ficus benghalensis.*

Bengal Fig-tree.] Ficus with several stems, dividing into many implicated branches, rising twenty or thirty feet high, striking root from their lower parts, and large, oval, obtuse, entire leaves.

5. *Ficus indica.*

Indian Long-leaved Fig-tree.] Ficus with a robust stem, branching twenty or thirty feet high, and long, spear-shaped, entire leaves.

6. *Ficus pumila.*

Dwarf Indian Fig.] Ficus with trailing, rooting stalks and branches, and oval, acute-pointed, entire leaves.

All these species are natives of hot countries, where most of them form large trees, but in

our stoves appear as shrubs, and their fruit is of no value.

To preserve them here, they must be kept in pots and retained in the stove. Their propagation is by layers and cuttings in spring and summer, planted in pots of light sandy earth, and plunged in the bark-bed.

FILAMENTA, Filaments, or thread-shaped parts of the stamina, which elevate the antheræ. See **ANTHERÆ** and **STAMEN**.

Filaments are in figure either slender like a thread or a hair, awl-shaped, wedge-shaped, or flat, sometimes twisted like a screw, and sometimes bent backwards, as in superb lily, &c. and in many plants are covered with a fine cottony down; and as to proportion, Filaments in some plants are very long, in others very short; of equal lengths, as in most flowers, or irregular and unequal, as in the lip and cruciform flowers; which two last circumstances constitute the classes *Didynamia* and *Tetradynamia*. See **CLASSIS**.

The situation of the Filaments is, in flowers of one petal (*monopetala*), generally inserted into the base of the corolla; in flowers that consist of more than one petal, they are attached either to the calyx, as in the class *icofandria*; or to the receptacle, as in the class *polyandria*; but in some genera, the Filaments are neither inserted into the calyx, corolla, nor receptacle, but into the pistil or style, as in all the genera of the class *gynandria*.

Upon the number of Filaments in flowers, is founded the first thirteen classes. See **CLASSIS**.

FILICES, Ferns, an order of the botanic class *cryptogamia*, consisting of somewhat imperfect plants, or such whose flowers and fruit are not in general perfectly known, and are defined to be plants which produce or bear their almost invisible flowers and seed on the back of their leaves.

The Filices, or fern-tribe, are by the botanists placed in the class of what they deem imperfect plants, which, in the ferns, are considered as vegetables without leaves and stem distinct; that is, the stem, or what supplies the place of one, is not distinguishable from the common foot-stalk of the leaves, so that the plants may be said to be acaulous, or otherwise the leaves and stalks all in one; which rise with a strong, erect, foot-stalk, dividing above into numerous winged folioles, very closely placed in a spreading order; and on the back of which, the minute flowers, whatever be their nature, are produced in great numbers, appearing as if glued thereto; but their minuteness prevents discovering their particular form or characters, or the parts of

fructification, as the stamina, pistillum, &c. and with respect to the supposed seeds, or what are commonly considered as such, we have not yet been able to discover with any degree of precision.

FLOS, the Flower, or parts of fructification of plants, &c.

A Flower is defined to be formed of all the parts of fructification necessary for the generation of all trees and plants, and consists of the following principal parts.

The *Calyx*, empalement, or cup; the outer green leaves immediately surrounding the corolla or petals. See **CALYX**.

The *Corolla*, petals, or flower-leaves; the fine coloured leaves placed within the calyx, and which immediately surround the stamina, &c. See **COROLLA**.

The *Stamina*, or male organs; the slender, thread-shaped parts, supporting the antheræ, placed immediately within the corolla, and surround the pistillum. See **STAMEN**.

The *Pistillum*, or female organs; consisting of the germen, style, and stigma, and are placed within the stamina and antheræ, and commonly occupy the centre of the flower. See **PISTILLUM**.

The *Pericarpium*, the fruit or seed-vessel, formed of the germen of the female organ, and succeeds to maturity after all the other parts of the Flower are decayed. See **PERICARPIUM**.

The *Semen*, or seeds, lodged within the pericarpium, or, in default thereof, in the bottom of the calyx, &c. See **SEMEN**.

Each of the above parts of a flower is fully explained under its respective head, which see.

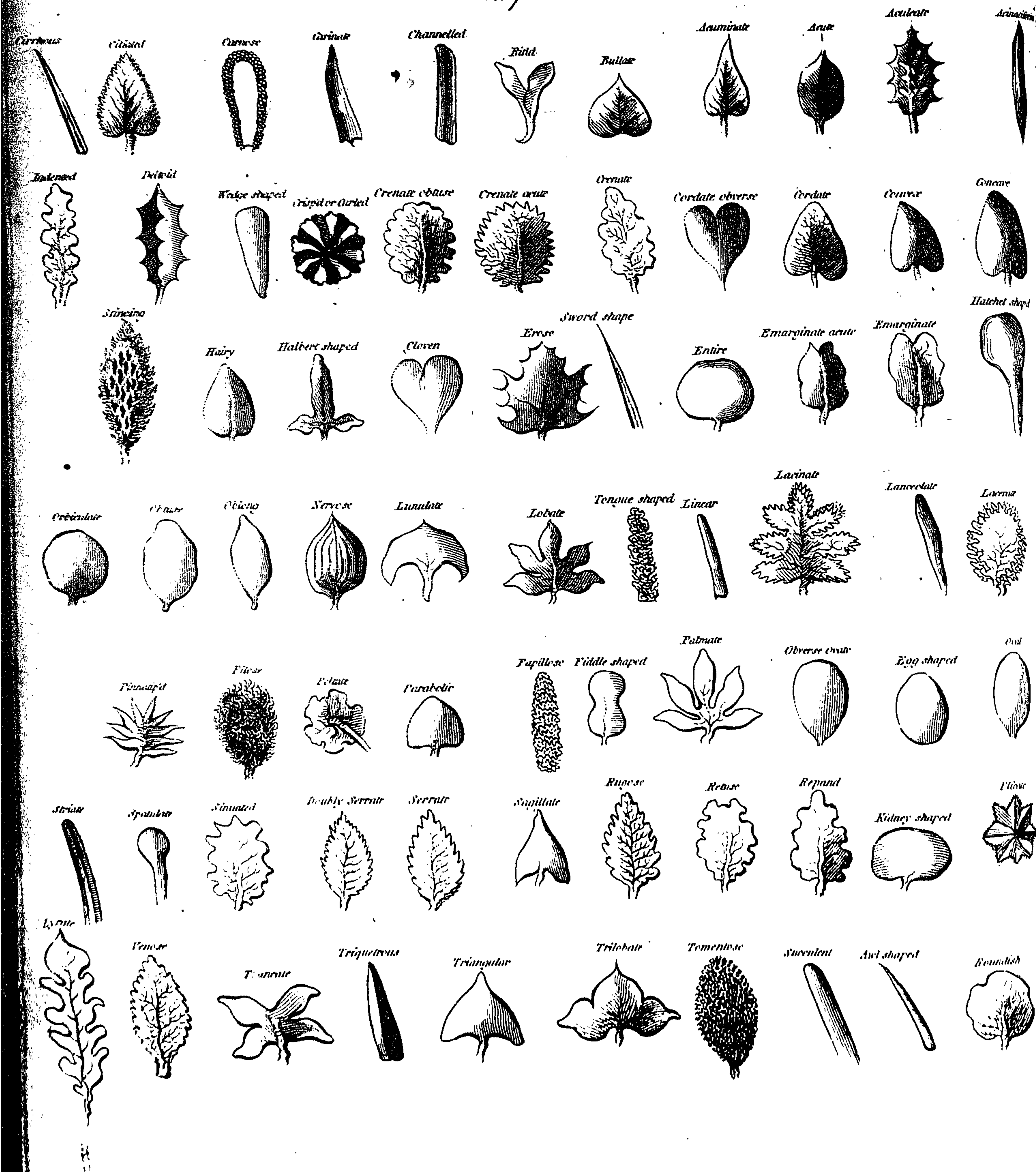
But as many Flowers have neither calyx nor corolla, they are still to be considered as a Flower, provided it is furnished with the *antheræ* or tops of the male organ, and the *stigma* or summit of the style, the female organ; for the essence of a Flower consists in these two principal organs *antheræ* and *stigma*.

In many plants, however, we have not been able to discover any resemblance of Flower or fruit, such as in numbers of the ferns, mosses, mushrooms, &c. but it is probable they are all furnished with similar parts, although their minuteness, or concealed situation within the plant, prevents any discovery thereof.

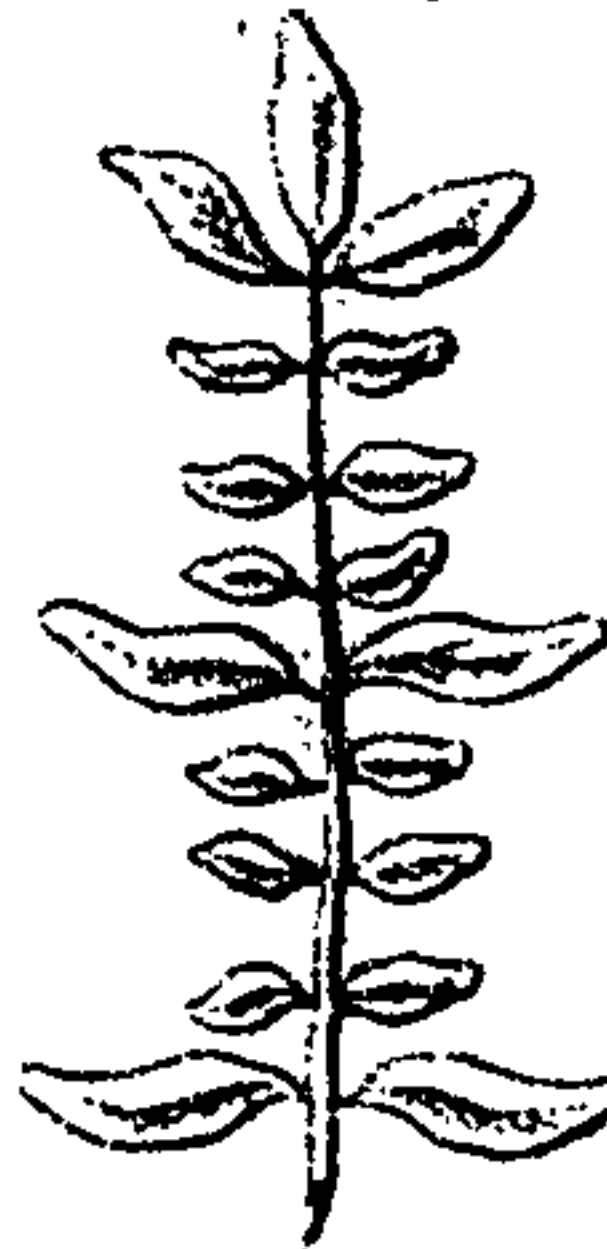
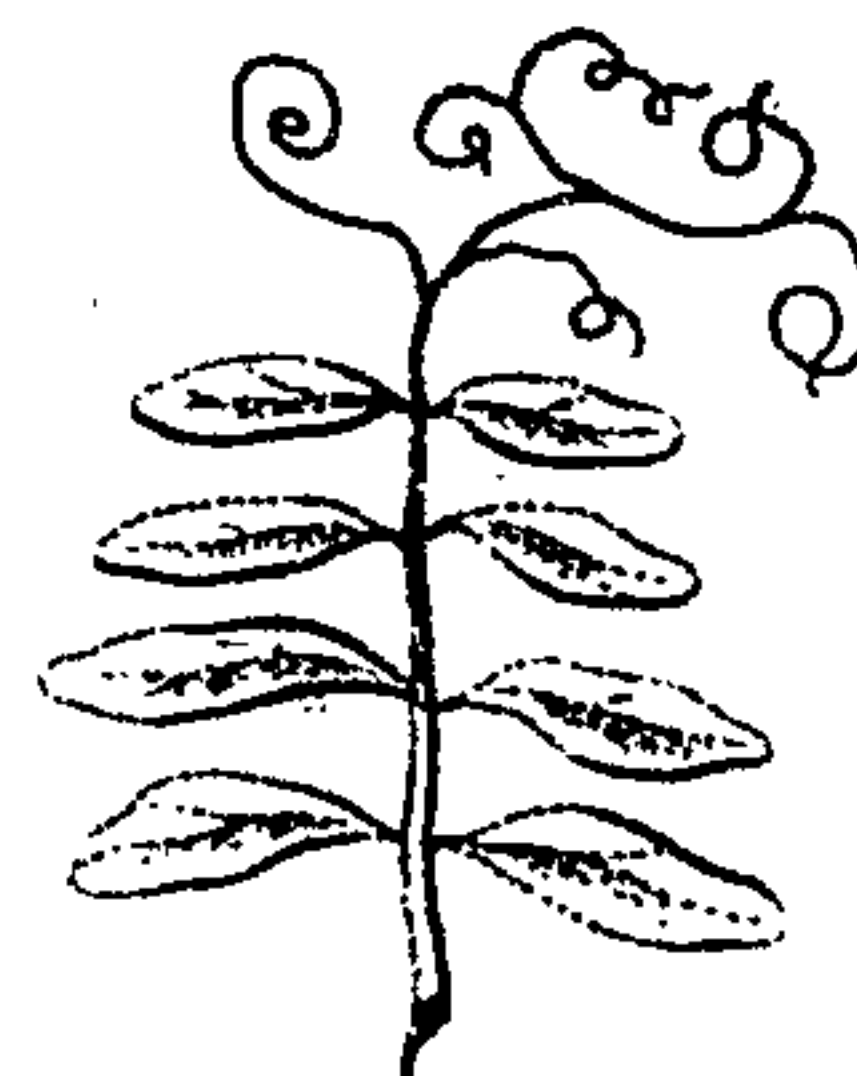
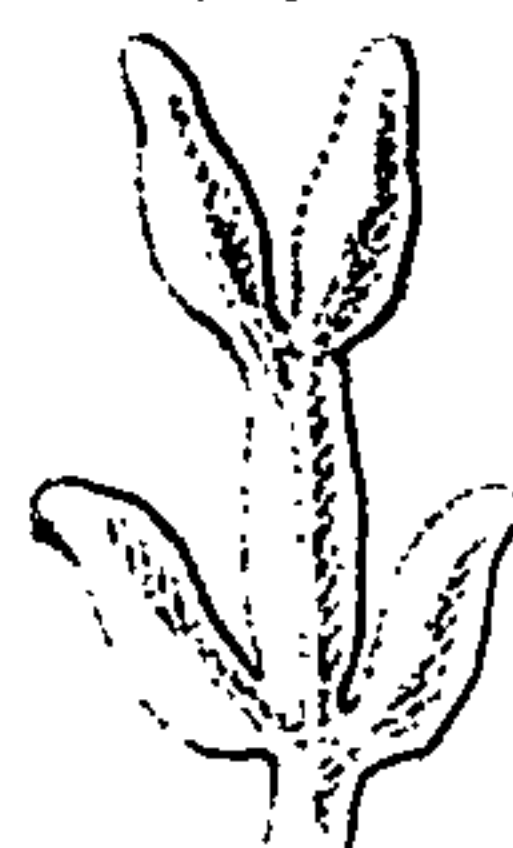
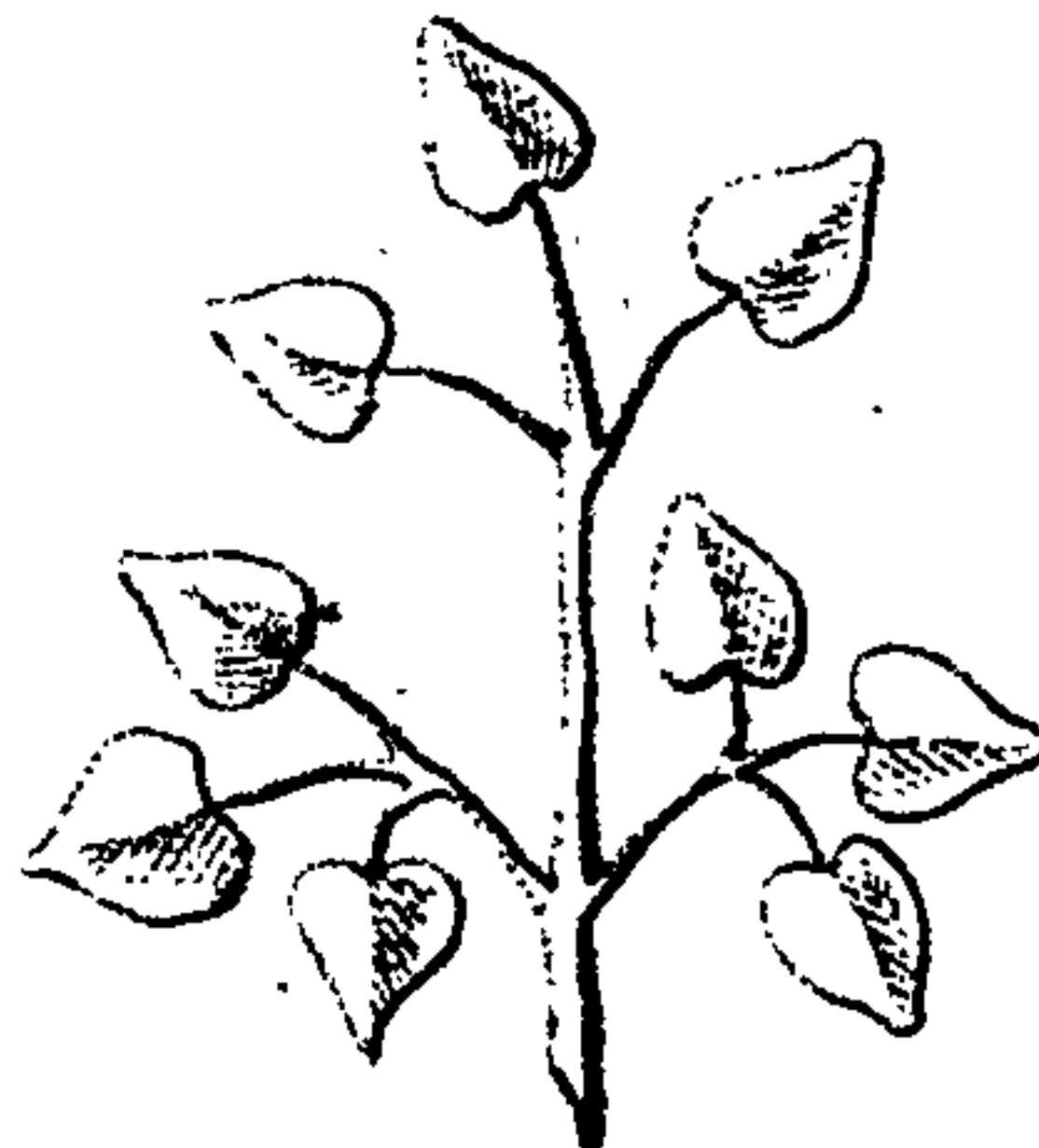
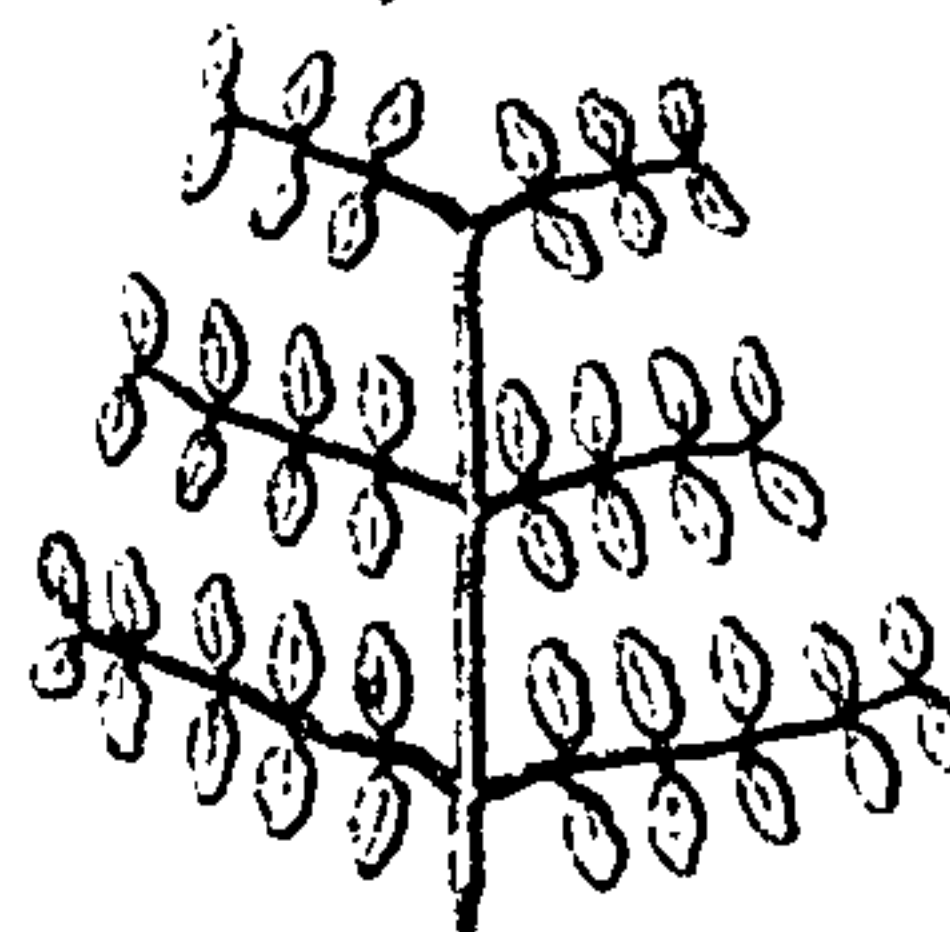
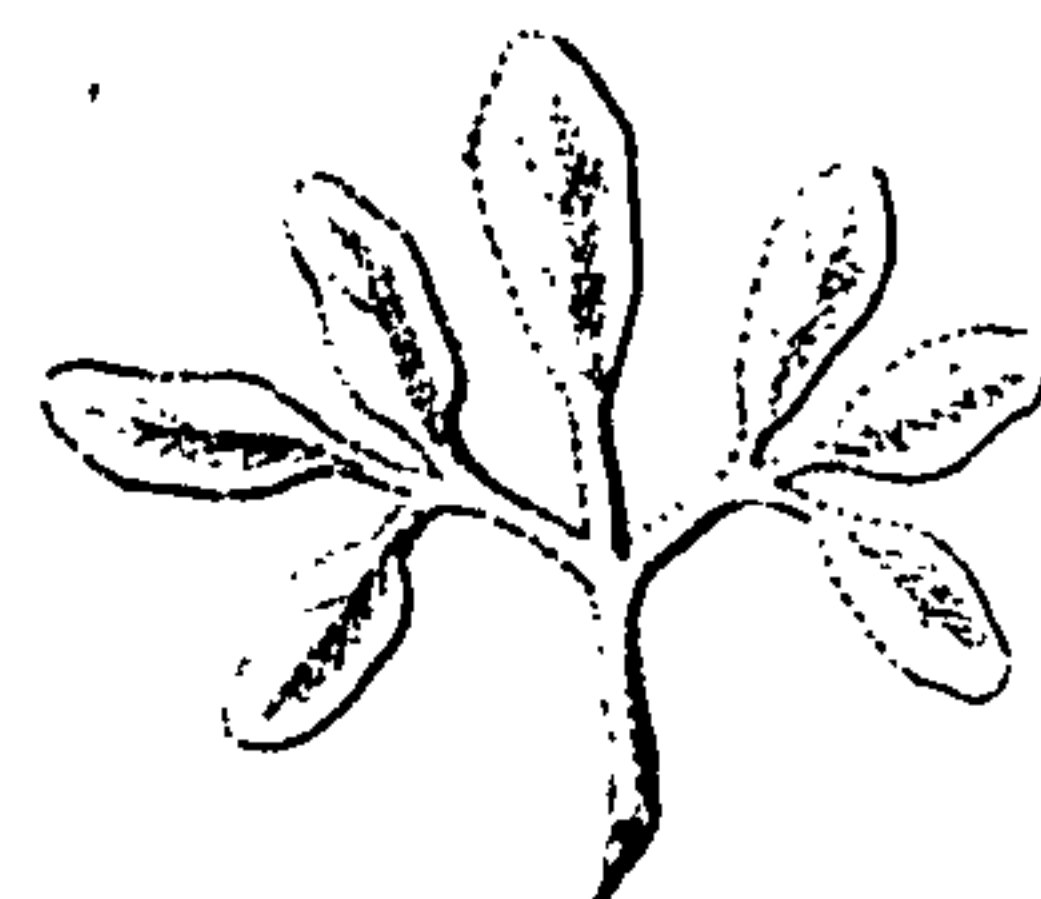
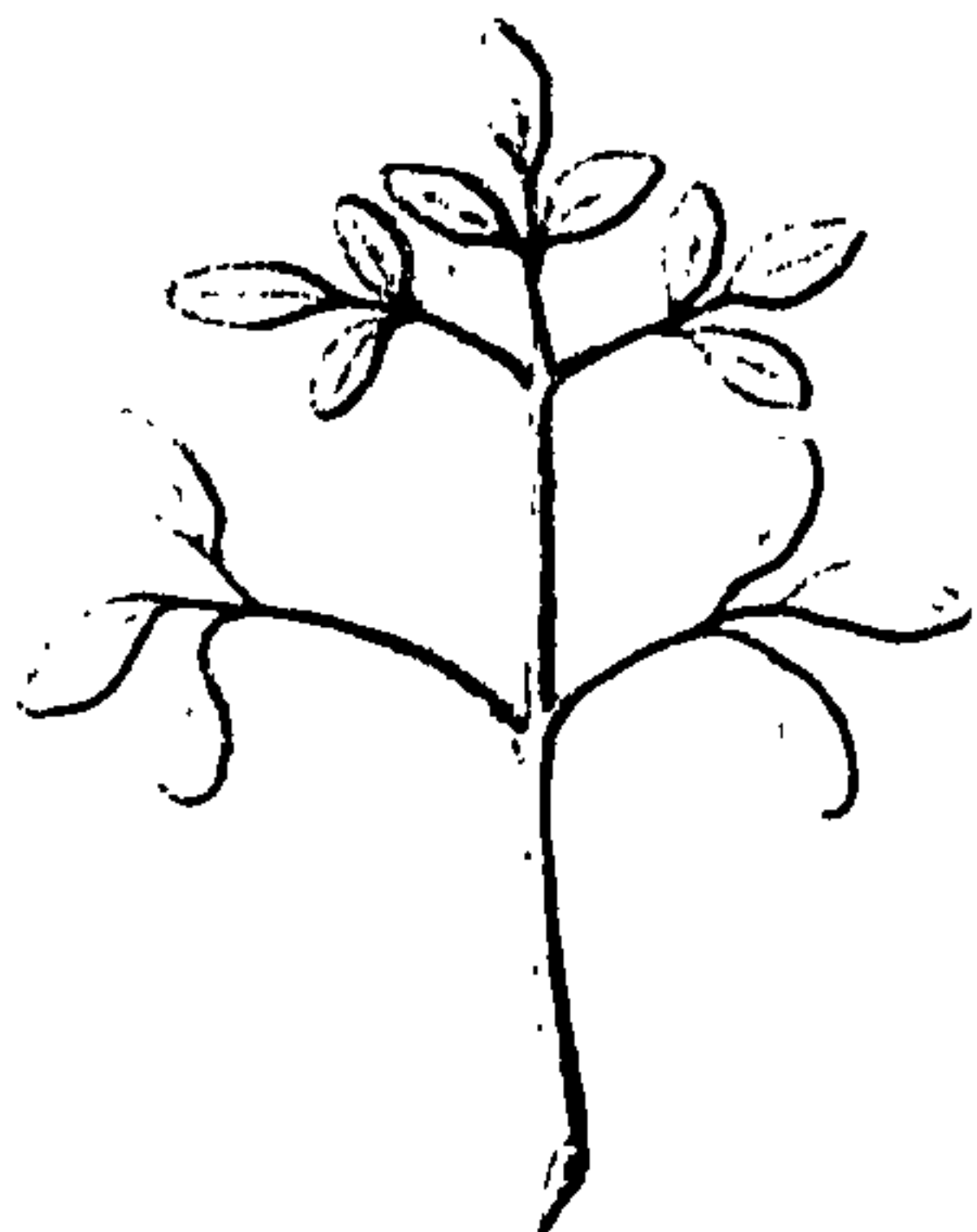
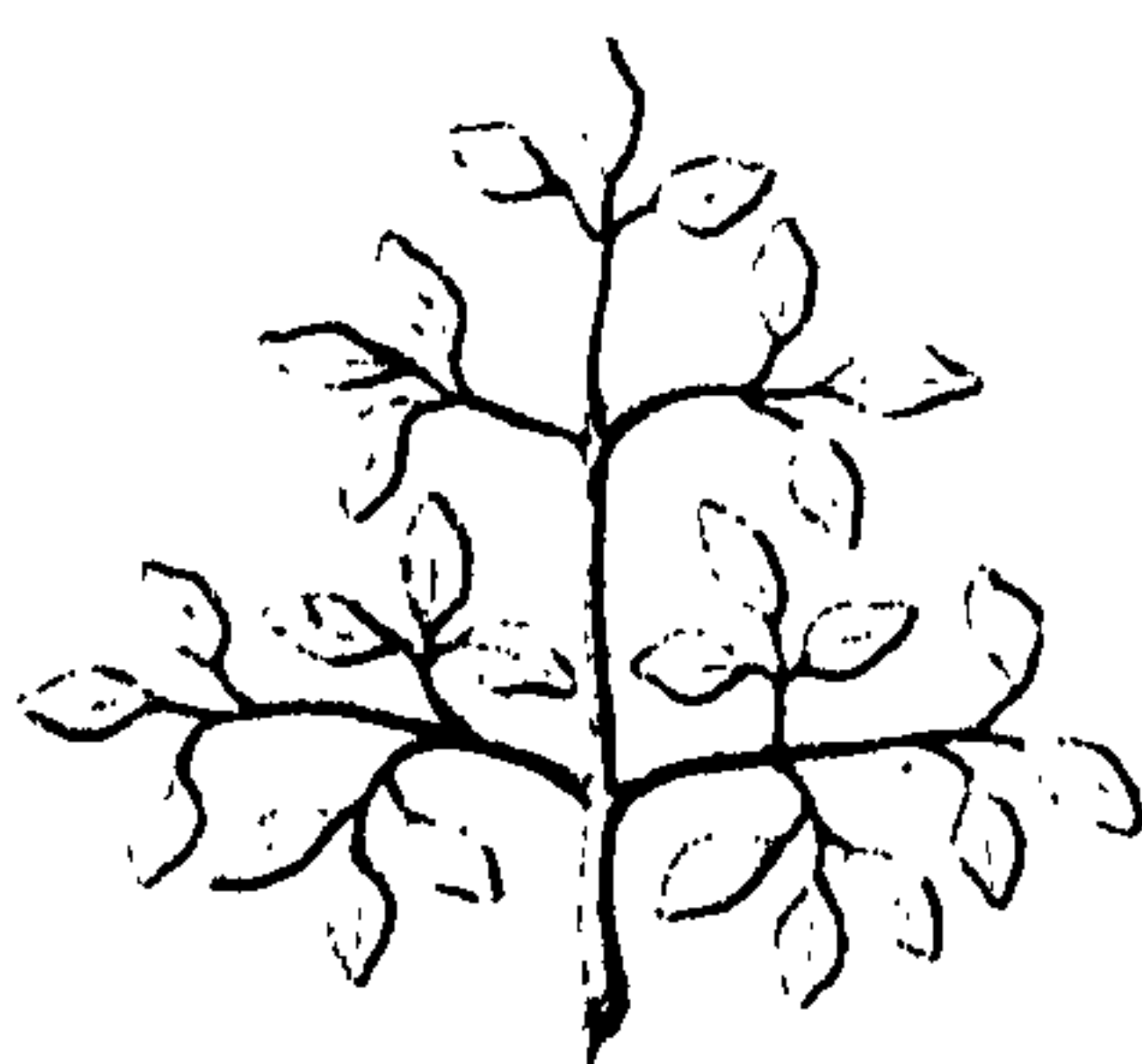
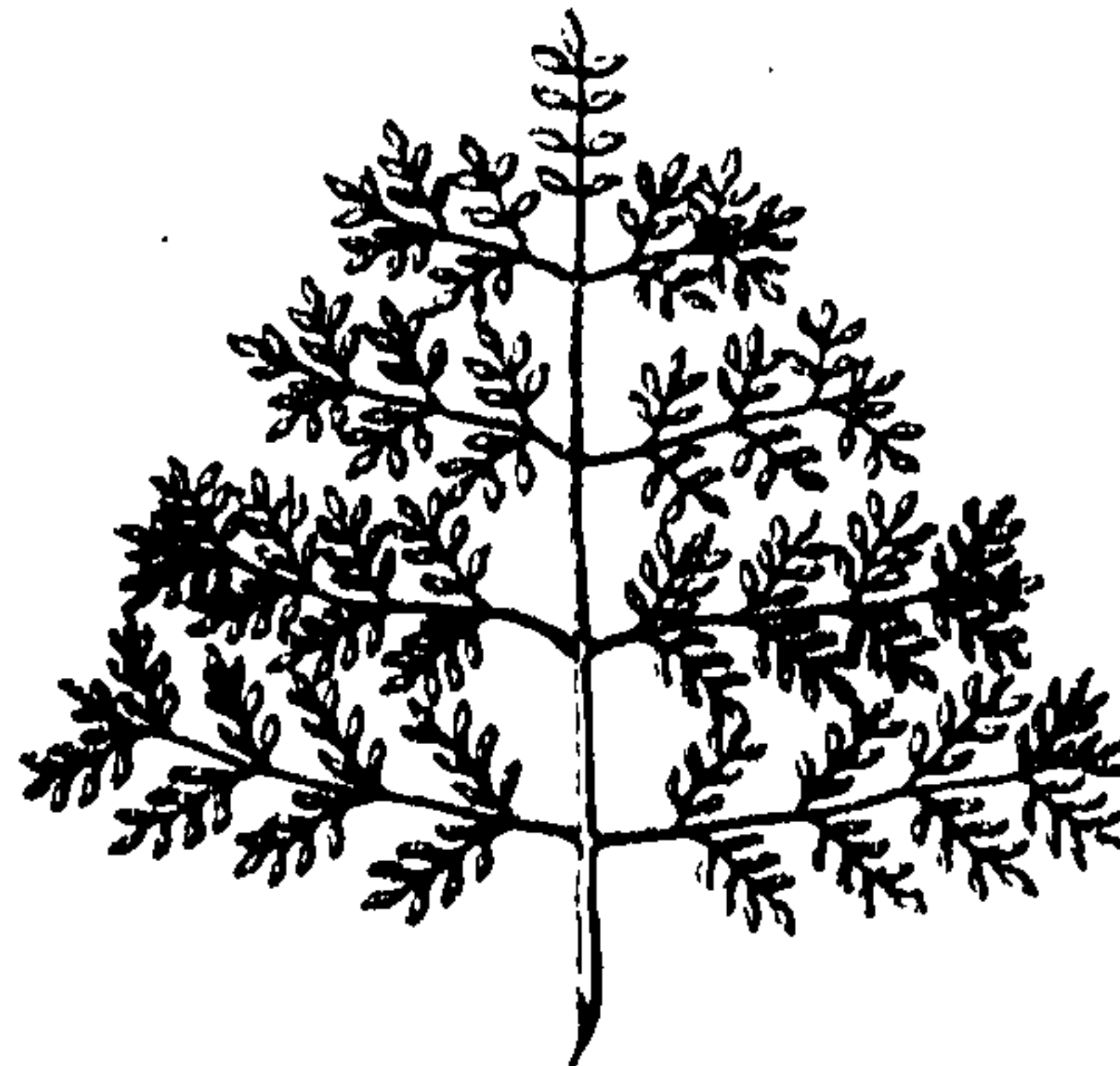
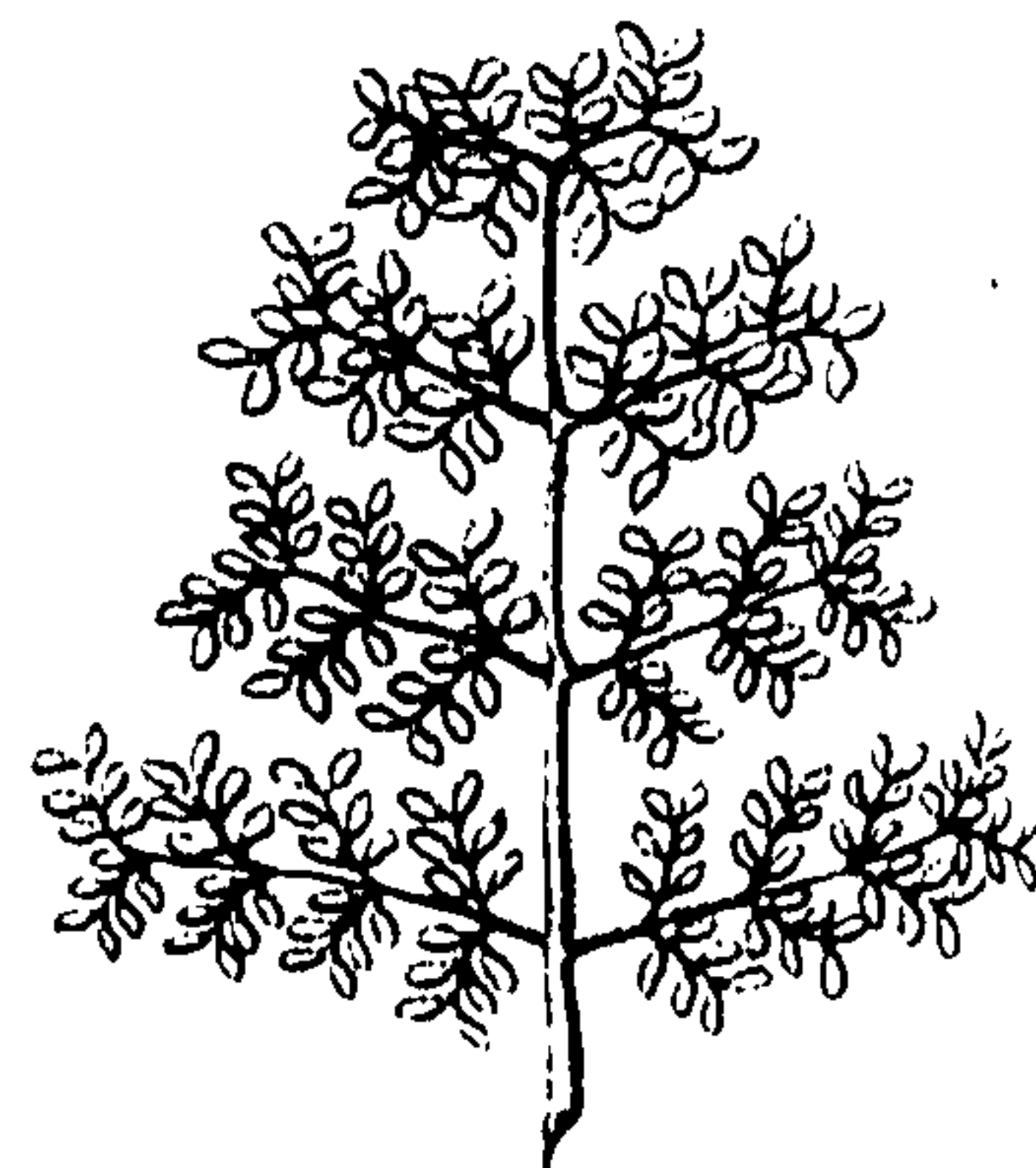
FLOSCULOSI, *Flosculous*, a term expressive of a compound flower, composed of many small florets, all flosculous, or formed each of one hollow funnel-shaped petal, termed separately flosculi; and which kind of compound flower is exemplified in blue-bottle, artichoke, thistle, &c. and in all the plants of the class *Syngenesia*.

FOLIOLA,

Simple Leaves.



COMPOUND LEAVES

Binate*Terminate sessile**Terminate petiolate**Diginate**Quinate**Pinnate**D° abrupt**D° Alternate**D° Interrupted**D° Curvose**D° Conjugate**Articulate**Decursive**Biternate**Bipinnate**Pedate**Biternate**Triternate**Tripinnate**Abrupt Tripinnate*

FOLIOLA, Folioles, the lesser Leaves or lobes of a compound Leaf.

FOLIUM, a Leaf, or Leaves, defined to be the organs of vegetation, and principal ornament of plants.

Leaves are such useful and necessary organs, that they attract and transpire the air for the vegetable support and life of the plants, as well as promote the growth of the flowers, fruits, and seeds of every sort. Trees perish when totally divested of them at an improper season; witness those which have undergone the depredations of insects and blights; likewise the practice of stripping off some leaves from plants, when we would suspend their growth; and sometimes in cold years, to admit the sun to accelerate the ripening of choice wall fruit; but in this case, it should not be practised till the fruit have acquired nearly their full bulk, and then only just thin out some where they too closely shade the fruit; for the leaves contribute greatly to their growth.

Far the greater number of plants are furnished with Leaves, though in some they are totally wanting, as in the *fungi* or mushroom tribe, shrubby horse-tail, and several kinds of fleshy succulent plants.

All foliated plants and trees, however, are not always adorned with Leaves; as for example, all the deciduous tribe are totally divested of them during the winter; but most sorts, both deciduous and ever-greens, produce new Leaves every year.

Leaves are of various figures, but generally extended into a plane membranaceous or skinny substance, and formed by the expansions of the vessels of the foot stalk, which divide into many ramifications or branches, crossing each other, form a kind of net, the meshes or interstices of which are filled up with a tender pulp or pith; this pulpy substance being sometimes consumed by certain insects, whilst the net-work remaining, exhibits the skeleton of the Leaf.

All Leaves have one side very distinguishable from the other, an upper and under surface, the former turned towards heaven, the latter downward; and this disposition is so essential to the vegetable economy, that if a branch is overturned in such a manner as to destroy the natural direction of the Leaves, they will of themselves, in about a week or little more or less time, resume their former position, and that as often as a branch is overturned; it is also observable, that from the time the Leaves are turned into a contrary direction, till they have recovered the natural position, the fruit makes hardly any progress

in growth; which shows how necessary it is to preserve all the branches of wall and espalier-trees firmly in their proper places; and when any is overturned by wind or other accidents, no time should be lost in fastening them up again, before the Leaves take a wrong direction.

Leaves, considered with respect to their form and disposition, may be divided into three classes, Simple, Compound, and Determinate.

Simple Leaves.

Simple Leaves are such as grow singly on a foot-stalk, or a foot-stalk terminated by a single expansion only, either entire or divided; that however deep the divisions, if they do not reach the middle rib, it is still a simple leaf; and as their different shapes, both entire and divided, are numerous, we will here exhibit the most material, each according to the botanic term or name.

Acerosum, chaffy; such as are very narrow and ever-green, as yew, pine, fir, and cedar.

Acinaciforme, scymitar-shaped; being fleshy, spear-pointed, having one edge narrow and convex, the other broad, as in *Mesembryanthemum Acinaciforme*.

Aculeatum, aculeate or prickly; as in some of the thistles.

Acutum, acute; terminated by a sharp point.

Acuminatum, acuminate; having the extremity sharp, like the point of an awl.

Anceps, two-edged.

Bullatum, bullated; blistered, or studded.

Bifidum, bifid; divided into two parts.

Canaliculatum, channelled or fluted.

Carinatum, carinate, or keel-shaped; as in keel-shaped aloë.

Carnosum, carnosose, or fleshy.

Cartilagineum, cartilaginous; having a gristly, thick, fleshy edge, different from the other part of the Leaf.

Ciliatum, ciliated or eye-lashed; having the edge surrounded longitudinally with parallel hairs.

Cirrhosum, cirrhous; ending with cirrhi, tendrils, or claspers.

Coloratum, coloured; as in *Amaranthus tricolor*.

Compressum, compressed; having a mark of impression equally on both sides.

Concavum, concave, hollow; the surface hollow in the middle, opposed to convex.

Convexum, convex; the middle rising higher than the sides.

Cordatum, } cordated, cordiform, or heart-
Cordiforme, } shaped, as in the lime-tree.

Cordatum-obversum, obversely cordated, or heart-shaped reverse.

Crenatum, crenated or notched; having the border

border indented or notched, that the indentings turn neither towards the top nor base, and are termed

Crenatum, acutum, when acutely or sharply crenated; having the indentures sharp at the ends.

——— *obtusum*, obtuse or bluntly crenated; having the ends of the indentures rounded.

——— *duplicatum*, doubly crenated; having small notches on the larger crenatures.

Crispum, crisped, curled; as in curled-mallow, curled-parsley, &c.

Cuneiforme, wedge-shaped; being much longer than broad, narrowing gradually from the top.

Deltoides, a deltoid leaf; formed like the Greek letter Delta, a triangle; but this does not exactly answer the character usually given of a deltoid leaf, which is described to be a quadrangular, having four angles, those at the extremities more distant from the centre than those of the sides, as in *Mesembryanthemum deltoides*, and *atriplex Halimus*.

Dentatum, indented; toothed, or having the borders ending in horizontal points.

Depressum, depressed; having a mark of impression on one side.

Delabrisforme, hatchet-shaped; roundish at top, compressed, projecting outward with a sharp edge.

Emarginatum, emarginated; notched at the top, and are termed

——— *acutum*, when acutely emarginated; having the parts on each side ending in sharp points.

——— *obtusum*, obtusely emarginated; having the two sides ending in blunt points.

Integrum, entire or undivided.

Integerrimum, very entire; having the borders quite entire, or free from all indentings or notches.

Ensiforme, sword-shaped; being compressed and edged like a sword.

Erosum, erose, gnawed; the border seems to be gnawed.

Fissum, cloven, or cut into two, three, four, or many segments.

Gibbum, gibbous, swollen; both surfaces swelling to a convexity.

Glabrum, glabrous, smooth.

Glaucum, glaucous, grey, or of a sea-green colour.

Hastatum, halberd-shaped; triangular, extended wide at the base, narrowing to a long sharp point at top.

Hirsutum, hairy, and bristly; having the surface covered with hairs like shag.

Hispidum, stinging; being covered with hairs, which strike into the flesh.

Laceratum, lacerate, or with a rent or ragged, irregular border.

Lanatum, woolly.

Lanceolatum, lanceolate, lancet-shaped, or spear-shaped; narrowing gradually from the middle to each end.

Laciniatum, lacinate, or jagged; having sinuses or cuts down to the middle, divided, as it were, into segments, which are jagged on the edges.

Linare, very narrow, and equally broad; as in rosemary, pine, fir, and the grasses.

Linguiforme, tongue-shaped; being commonly fleshy and compressed.

Lobatum, lobed; divided into two, three, or more lobes, termed,

——— *bilobum*, two-lobed.

——— *trilobum*, three-lobed.

——— *quadrilobum*, four-lobed.

——— *quinelobum*, five-lobed, &c.

Lunulatum, lunulate or moon-shaped; being shaped like a half moon.

Lyratum, lyre-shaped; divided into transverse segments, the upper ones the largest.

Membranaceum, membranous; without pulp between the two surfaces.

Nervosum, nervose; having nerves or vessels extending singly from the base to the extremity.

Nitidum, shining and glossy.

Nudum, naked; without any kind of hair or pubescence.

Oblongum, oblong; twice as long as broad.

Obtusum, obtuse; blunt, rounded at the extremity.

Orbiculatum, orbicular, round; being orbicularly round, as in *Crassula orbiculata*.

Ovale, oval, or elliptic.

Ovatum, egg-shaped.

——— *obversum*, obversely egg-shaped, by the small end being affixed to the stalk.

Palmatum, palmated, or hand-shaped; being deeply divided longitudinally down to the base into several parts, spreading out like an open hand.

Panduriforme, fiddle-shaped.

Papillosum, papillose, covered with pimples or vesicles, as in *Mesembryanthemum crystallinum*, or diamond ficoides.

Parabolicum, parabolical; half egg-shaped.

Partitum, partite; being divided down to the base, which is into two, three, four, five, or many parts, are termed

——— *bipartitum*, divided into two parts.

——— *tripartitum*, divided into three parts.

——— *quadripartitum*, divided into four parts.

——— *quinquepartitum*, divided into five parts.

Partitum

Partitum multipartitum, divided into many parts.

Peltatum, peltate, target-shaped; having the foot-stalk inserted into the centre of the lower surface, and not into the base, or margin, exemplified in *Palma Christi* and water-lily.

Pentangulare, pentangular, or five-angled.

Pentagonum, five-sided; having five flat sides.

Pilosum, pilose; covered with distinct hairs.

Pinnatifidum, pinnatifid; being divided horizontally into many long segments, resembling a pinnated, or winged leaf.

Pinnatum, pinnated. See *Compound Leaves*.

Planum, plane, flat; having an even plane surface.

Plicatum, plicate, plaited, or appearing like folds, by the surface rising and falling in angles, as in *Alchemilla*.

Punctatum, punctate; dotted, or set with hollow points.

Quadrangulare, quadrangular; four-edged, or four-angled.

Quinquangulare, five-angled; the same as pentangular.

Reniforme, kidney-shaped; as in common *Asarabacca*.

Repandum, repand, or serpentine; having the edges sinuated in a serpentine manner.

Retusum, retuse; blunted at the end.

Rugosum, wrinkled, having the veins sunk, so that the surface appears uneven.

Sagittatum, sagittate, arrow-shaped; being shaped like the head of an arrow.

Scabrum, rough, rugged; having the surface covered with little irregular tubercles.

Serratum, serrated, or sawed; having the edges notched like a saw, the indentings bending towards the top of the leaf: there are also,

—— *retrorsum*, sawed backward.

—— *obtusum*, obtusely sawed; having the indentings obtuse and weak.

—— *duplicatum*, doubly sawed; having small serratures upon the greater.

Sessile, sitting close.

Sinuatum, sinuated; having sinuses or hollows along the border or margin.

Spatulatum, spatula-shaped; being oblong, widening and rounded upward, but narrow below.

Striatum, streaked, or with many slight longitudinal furrows or stripes on its surface.

Spinosum, spinous or thorny; as *Acanthus spinosus*, &c.

Sulcatum, furrowed or ridged; having a number of longitudinal ridges.

Subrotundum, roundish; almost orbicular,

only being a little broader or larger in some part or other.

Subulatum, subulate, awl-shaped; being broadest at the base, contracting gradually to the extremity, into a sharp point.

Succulentum, succulent; generally thick, fleshy, and full of moisture, as in *Aloe*, *Cotyledon*, &c.

Teres, cylindric, and tapering.

Tomentosum, tomentose; downy, closely covered with fine velvety down.

Trilobatum, trilobed, or three-lobed; divided into three lobes or segments.

Triangulare, triangular; forming three angles, the two lowest being level with the base.

Trigonum, trigonal, three-sided, or three-edged; having three sides, and as many sharp edges, and grow narrow from the base to the extremity.

Triquetrum, three-sided like the former, but the sides are flatter, and the edges not so prominent.

Tetragonum, four-sided.

Truncatum, truncate; when the point seems to be cut off transversely, as in *Liriodendron Tulipifera*, tulip-tree.

Tubulosum, tubulose, or hollow within; as in *Allium Cepa*, the onion.

Venosum, venose, veined; having many branched vessels, like veins, running through the surface.

Viscidum, viscid; viscous, clammy or glutinous.

Undulatum, undulate, waved; rising and falling in convexities towards the margin.

Compound Leaves.

A compound Leaf, is that which is composed of two, three, or many smaller leaves or *foliola*, supported on one common foot-stalk; which assemblage of folioles or lobes, if ever so large or numerous, on one petiole, or general foot-stalk, constitute but one compound leaf, *folium compositum*; these smaller leaves or folioles constituting the compound, are, singly of themselves, small simple leaves, varying in their form, according to the distinction already given, and are sometimes furnished with short foot-stalks (*petioli*) issuing from the main one, sometimes seated close (*sessile*) to the middle rib, without any proper foot-stalk of their own.

Compound leaves may be divided into three classes or divisions—1. The compound properly so called, being only once compounded, the *foliola* being supported immediately on the main foot-stalk.—2. Decompound, twice compounded; the foot-stalk dividing into lesser, and on which the *foliola* are supported.—3. Supradecompound, several times

times compounded; the main foot-stalk dividing into others, these subdividing into smaller, and on which are supported the folioles; each of which three classes of compound admit of a variety of modifications, which give rise to as great a variety of terms, viz.

Binatum, binate; two, formed of two folioles on one foot-stalk.

Ternatum, ternate; three, having three folioles.

Digitatum, digitate, fingered; having several long lobes attached to the top of the foot-stalk, and spread out like the fingers of a hand.

Quinatum, quinate, five-lobed.

Pinnatum, pinnated or winged; having many folioles arranged along each side of the rib, or prolongation of the common foot-stalk, like wings, as in Acacia, Sumach, and hence called pinnated or winged leaves, of which are the following modifications.

———— *cum impari*, completely pinnated; a winged-leaf terminated by an odd foliole, proceeding from the extremity of the middle rib.

Pinnatum abruptum, abruptly pinnated; not terminated by an odd lobe.

———— *oppositum*, oppositely pinnated; the folioles standing opposite to each other.

———— *alternum*, alternately pinnated; the lobes placed alternately.

———— *interruptum*, interruptedly winged; the folioles being alternately larger and smaller.

———— *cirrhosum*, cirrhose pinnated; the extremity terminated by a *cirrus*, or clasper.

———— *decurrens*, decurrently pinnated; having the base of the folioles running along the mid-rib from one to the other.

———— *conjugatum*, conjugate pinnated; paired, the winged-leaf composed of one pair of folioles only.

Decompositum, decompound-leaves, or twice compound; having the main foot-stalk divided into smaller; and these smaller ones support the lobes.—And of this kind of compound leaves are:

Biternatum, or *ternatum-duplicatum*, doubly three-lobed; the foot-stalk dividing into three smaller, each supporting three *foliola*.

———— *pinnatum duplicatum*, doubly pinnated; the main foot-stalk having smaller ones arranged on each side, and on these are arranged the folioles.

———— *bipinnatum*, doubly-winged, as the former.

———— *pedatum*, pedate, or foot-shaped. the foot-stalk divides, and has the folioles ranged on the inside.

Supradecompositum, supradecomposed, or several times compounded; the main foot-stalk, dividing into others, these subdividing into smaller, and upon which are supported the lobes or *foliola*. And admits of the following varieties:

———— *ternatum triplicatum*, triple three-leaved; the foot-stalk divides into three smaller, each of these into three others, and each of which support three lobes or *foliola*.

———— *pinnatum triplicatum*, triple-pinnated, or triple-winged; the main foot-stalk supporting smaller petioles along each side, these also have smaller ones issuing from both sides, and upon each side of these latter are ranged the *foliola*.

Determinate Leaves.

By *Determinate Leaves*, whether simple or compound, is not considered their figure, or structure, but their place, situation, and insertion on the parts of the plant, and their direction.

Adpressum, appressed; laid close to the stem.

Adversum, adverse; turns its side towards the south, not upward.

Alternatum, alternate; the reverse of opposite, being placed singly one above another, gradually on each side of the stem.

Amplexicaule, its base embraces the stem quite round.

Axillare, axillary; arising from the angle between the branch and the stem, or that between the greater and smaller branches.

Articulatum, articulate, or jointed; one leaf growing on the top of another.

Caulinum, cauline, or stem leaves; such as grow immediately on the stalk or stem.

Confertum, confert; growing in clusters.

Connatum, connate; leaves growing opposite, connecting at their base, appearing as one, as in some species of honeysuckle.

Decurrens, a decurrent or running leaf; having the base running along the stem, as in some thistles.

Demersum, demerse; sunk under water.

Dependens, dependent; pointing downward to the earth.

Distichum, distich, two-rowed; being ranged along two sides of the branches only.

Erectum, erect; upright, so as to make an acute angle with the stem.

Fasciculatum, fasciculate; in bundles from the same point, as in the larch-tree.

Florale, floral; placed near the flower.

Horizontale, extended flat or parallel to the horizon; forming an exact right-angle with the perpendicular.

Imbricatum, imbricate; growing over one another like tiles, or scales of fishes.

Inflexum,

Inflexum, inflex; turning the point towards the plant.

Natans, natant; floating on the surface of the water.

Obliquum, oblique; the base rising upward, and the point toward the horizon.

Oppositum, opposite leaves; the reverse of alternate; being such as grow in pairs exactly opposite.

Patens, patent, spreading; recedes from the stem so as to form an acute angle therewith.

Perfoliatum, perfoliate; the base surrounds the stem or branch, without touching it with its margin or border, appearing as if perforated by the stem running through its disk or middle.

Peltatum, peltate, shield-shaped; having the foot-stalk attached to the middle of its disk, not to the edge; resembling the form of a shield, or target.

Petiolatum, petiolate, foot-stalked; having a foot-stalk.

Quaternatum, four surrounding the stalk at a joint.

Quinternatum, five surrounding the stalk at a joint.

Radicale, radical; arising directly from the root.

Radicans, radican, rooting; strikes root in the ground.

Rameum, rameous, a branch leaf; placed on the branches.

Reclinatum, reclined, bending downward; the extremity lower than the base.

Revolutum, revolute; rolled back.

Semi-amplexicaule, half embracing the stalk or branch, with its base.

Seminale, seminal, or seed-leaf; springing directly from the seed.

Sessile, sessile; sitting close to the stem or branch, without any foot-stalk.

Sparsum, sparsed, scattered; placed irregular, without any order.

Stellatum, stellate, starry; several surrounding the stalk at each joint, expanding in a star-like manner.

Ternatum, ternate; three surrounding the stem at a joint.

Vaginans, vaginant, sheath-like; surrounding the stalk like a sheath, as in the grasses and many liliaceous plants.

Verticillatum, verticillate, whorled; many leaves placed round the stalk at the joints, in whorls or whirls.

The foregoing list of the botanic terms, and short descriptions of the various kinds of Leaves, will assist in conveying an idea of their forms and determination, &c. according to the terms used in describing them in the various species and varieties in each genus.

The Leaves furnish very elegant and natural marks in discriminating the species of plants; in no part is nature more various than in the structure of the Leaves, by which very numerous species are determined, and ought always to be studied by the young botanist.

FORCING FRAME, a sort of glass-case, or light building fronted with glass Frames, in which to force flowers and fruits to early perfection, by aid of artificial heat, either of dung, tanner's-bark, or actual fire.

The general acceptation or meaning of a Forcing Frame is, a fixed erection full to the south sun; the length may be from ten to fifty or one hundred feet; the width from five to fifteen, and from five to ten high; having an upright back wall, of wood or brick; and a front of glass-work, made sometimes in one continued range of slope to the top of the back wall; and sometimes with upright glass-work, head high, ranging immediately along the front, and from the top of which a glass roof is carried to the top of the back or main wall; either of which may be for general use, for the reception of various sorts of flower-plants, small flowering shrubs, esculents, and dwarf fruit-trees, &c. occasionally, to force into bloom or fruit, &c. in winter, or early in spring and summer; whereby many sorts of the more curious flowers and fruits may be obtained some months before their natural season, which will be a great curiosity, and which is effected, as aforesaid, by aid of dung, bark, or fire heat; the former (dung heat) both by applying the dung principally against the outside of the back wall, and by forming it into a bed internally; the second (bark heat) by forming it into a bed, in a pit within-side; and the third (fire heat) by having several returns of flues against the inside of the back wall, and that of the front and both ends, for the heat to pass along; each of which hereafter described: for these kind of Frames are of different construction, according to the sorts of plants chiefly intended to be forced; and the materials of heat, as dung, bark, or fuel, most convenient to be obtained for forcing them; so that the construction of each kind of Frame is separately exhibited.

Many of these Frames are employed in the vicinity of London, for forcing various plants early for market, particularly for Covent-garden, where, in early spring, in March, April, and May, we shall see exhibited for sale various sorts of flowers, fruits, and other esculents, that would not, in their natural state of growth, have appeared till June or July.

But, for private use, where there is a roomy

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Demersum, demerse; sunk under water.

Dependens, dependent; pointing downward to the earth.

Distichum, distich, two-rowed; being ranged along two sides of the branches only.

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Inflexum, inflex; turning the point towards the plant.

Natans, natant; floating on the surface of the water.

Obliquum, oblique; the base rising upward, and the point toward the horizon.

Oppositum, opposite leaves; the reverse of alternate; being such as grow in pairs exactly opposite.

Patens, patent, spreading; recedes from the stem so as to form an acute angle therewith.

Perfoliatum, perfoliate; the base surrounds the stem or branch, without touching it with its margin or border, appearing as if perforated by the stem running through its disk or middle.

Peltatum, peltate, shield-shaped; having the foot-stalk attached to the middle of its disk, not to the edge; resembling the form of a shield, or target.

Petiolatum, petiolate, foot-stalked; having a foot-stalk.

Quaternatum, four surrounding the stalk at a joint.

Quinternatum, five surrounding the stalk at a joint.

Radicale, radical; arising directly from the root.

Radicans, radican, rooting; strikes root in the ground.

Rameum, rameous, a branch leaf; placed on the branches.

Reclinatum, reclined, bending downward; the extremity lower than the base.

Revolutum, revolute; rolled back.

Semi-amplexicaule, half embracing the stalk or branch, with its base.

Seminale, seminal, or seed-leaf; springing directly from the seed.

Sessile, sessile; sitting close to the stem or branch, without any foot-stalk.

Sparsum, sparsed, scattered; placed irregular, without any order.

Stellatum, stellate, starry; several surrounding the stalk at each joint, expanding in a star-like manner.

Ternatum, ternate; three surrounding the stem at a joint.

Vaginans, vaginant, sheath-like; surrounding the stalk like a sheath, as in the grasses and many liliaceous plants.

Verticillatum, verticillate, whorled; many leaves placed round the stalk at the joints, in whorls or whirls.

The foregoing list of the botanic terms, and short descriptions of the various kinds of Leaves, will assist in conveying an idea of their forms and determination, &c. according to the terms used in describing them in the various species and varieties in each genus.

The Leaves furnish very elegant and natural marks in discriminating the species of plants; in no part is nature more various than in the structure of the Leaves, by which very numerous species are determined, and ought always to be studied by the young botanist.

FORCING FRAME, a sort of glass-case, or light building fronted with glass Frames, in which to force flowers and fruits to early perfection, by aid of artificial heat, either of dung, tanner's-bark, or actual fire.

The general acceptation or meaning of a Forcing Frame is, a fixed erection full to the south sun; the length may be from ten to fifty or one hundred feet; the width from five to fifteen, and from five to ten high; having an upright back wall, of wood or brick; and a front of glass-work, made sometimes in one continued range of slope to the top of the back wall; and sometimes with upright glass-work, head high, ranging immediately along the front, and from the top of which a glass roof is carried to the top of the back or main wall; either of which may be for general use, for the reception of various sorts of flower-plants, small flowering shrubs, esculents, and dwarf fruit-trees, &c. occasionally, to force into bloom or fruit, &c. in winter, or early in spring and summer; whereby many sorts of the more curious flowers and fruits may be obtained some months before their natural season, which will be a great curiosity, and which is effected, as aforesaid, by aid of dung, bark, or fire heat; the former (dung heat) both by applying the dung principally against the outside of the back wall, and by forming it into a bed internally; the second (bark heat) by forming it into a bed, in a pit within-side; and the third (fire heat) by having several returns of flues against the inside of the back wall, and that of the front and both ends, for the heat to pass along; each of which hereafter described: for these kind of Frames are of different construction, according to the sorts of plants chiefly intended to be forced; and the materials of heat, as dung, bark, or fuel, most convenient to be obtained for forcing them; so that the construction of each kind of Frame is separately exhibited.

Many of these Frames are employed in the vicinity of London, for forcing various plants early for market, particularly for Covent-garden, where, in early spring, in March, April, and May, we shall see exhibited for sale various sorts of flowers, fruits, and other esculents, that would not, in their natural state of growth, have appeared till June or July.

But, for private use, where there is a roomy

pine-apple stove, it may also be used occasionally, for forcing many sorts of plants, flowers, and some sorts of fruits, with equal success, sufficient for the supply of a family.

However, where considerable supply is required, a Forcing Frame distinct from the pine-stove would be more convenient.

In either of these departments may be introduced for forcing, pots of strawberries, kidney-beans, roses, honeysuckles, jasmines, and any other flowering shrubs; likewise carnations, pinks, sweet-williams, wall-flowers, stock-gilliflowers, narcissuses, jonquils, and early dwarf tulips, and any other desirable flower-plants or roots, that may be required early for curiosity; also several kinds of curious annuals, as balsamines, gomphrenas, &c. and may likewise have several sorts of dwarf fruit-trees, as early May and May-duke cherries, peaches, nectarines, apricots, figs, grapes, gooseberries, currants, raspberries, &c.

The general construction of each sort of these Frames is exhibited under separate heads, according to the materials of heat used in forcing them, viz. by dung-heat, bark-bed heat, and by fire-heat.

By Dung-heat.

By Dung-heat.—This is not only the most simple and cheapest kind of Forcing Frame in its construction, but also considerably the cheapest in working, with respect to the article heat, as it may be forced effectually by substantial linings of hot dung against the back and ends.

This Frame is formed with an upright back and ends of deal planking, and a sloping front of movable glass-lights; the length may be ten, twenty, or thirty feet, or more; the width, from three to five, and five or six high; the Frame work be of inch and half deal planking, tongued, and closely joined, that no steam from the dung may penetrate into the Frame; raised five, six, or seven feet high behind, and but ten or twelve inches high in front, raising both ends answerable to the front and back; the glass-work to range, from the upright in front, sloping upward towards the back wall, to about a foot width at top, there resting the ends upon proper Frame-work of wood; and bars or bearers, three inches width, must range sloping from the back to front, for the support of the lights, as in common hot-bed frames, and the top of all to be boarded wind and water tight; within-side may be two or three ranges of narrow shelves along the back and ends, for pots of small plants, and the bottom levelled, on which to place pots of larger kinds; or you may have shelves rising one behind another quite from the front half way up the back wall,

so may place the lowest plants in front, the others in order behind them, rising gradually to the tallest in the back row.

From the above general sketch, you will easily form an idea of the proper construction of a dung-heat Forcing Frame; which you may improve as you shall see convenient.

This kind of Frame may be used with good success where dung is plenty, and easily obtained; particularly for forcing roses, or any other small flowering plants, whose flowers have merit in beauty or fragrance:—may also try pots of dwarf-cherries, peaches, &c. also pots of gooseberries, currants, and strawberries, carnations, pinks, and the like; having all the sorts in pots separately, and in which they are to be placed in the Frame.

The season to begin to work this Frame is January and February, and may be continued occasionally till May; but for any kind of fruit trees, the beginning of February is time enough, though those plants of any kind that are designed to be forced, may be placed in the Frame a month or two before forcing time, to be occasionally protected with the glasses in hard frosts; but at other times, let them enjoy the full air till you begin forcing.

The method of working this Frame is thus: after having placed the pots of plants in regular order, the tallest behind, and the lowest in front, &c. then put on the lights, and having a sufficient quantity of fresh stable-dung, full of heat, prepared as for common dung hot-beds, let it be piled up close against the outside of the back and ends a yard wide at bottom, drawing it gradually into a foot width at top of the Frame, finishing it somewhat sloping, to throw off wet; observing, that according as the dung settles or sinks down, a fresh supply must be added at top, to maintain the lining to the full height of the Frame.

This lining will effectually throw in a fine growing heat, and soon set all the plants in motion; observing to give air in the middle of fine days, by sliding one or more of the lights a little down; especially when the plants begin to push; give also moderate watering occasionally in mild sunny weather, and cover the glasses in cold nights with mats.

In three or four weeks, when the heat begins to decrease considerably, it must be renewed; either by entire fresh dung, or if new dung is scarce, by shaking up the old, taking the worst away, and mix the remainder with a due quantity of new, working the whole again in a pile close against the back and ends as before; which work must be repeated every three weeks or month, or as often as you shall see occasion; for the heat must be constantly

stantly preserved to a regular brisk temperature.

A Frame of the above construction may be appropriated entirely for fruit trees, planting them in a border prepared within the Frame against the back wall, and trained in the manner of wall-trees to a treillis, ranged five or six inches from the back erection; in which may be planted early dwarf-cherries, peaches, nectarines, apricots, grapes, figs, currants, &c. so may be worked by dung-heat against the back of the Frame as above directed; beginning in February, and continuing the glasses on, as well as support the dung-heat until May; and there is no doubt, with good management, but that the different sorts of fruit may be brought to perfection early.

But a dung-heat Forcing Frame may be constructed of more capacious dimensions, to admit of making a substantial hot-bed of dung internally, both to produce an increased degree of heat, and wherein to plunge pots of several sorts of flowering and esculent plants to bring them forwarder in growth, being assisted also with a lining of hot dung applied to the exterior of the back part of the Frame, as explained in the foregoing: and for the internal hot-bed, should form a bottom pit of proper width, length, and depth, making the bed therein a yard deep in good hot dung, covering the top with light dry earth, or old or new tan-bark, six or eight inches thick, in which to plunge the pots of flowers, or those of early esculents, such as kidney-beans, peas, strawberries, fallading, &c.

By Bark-bed heat.

By Bark-bed heat.—This kind of Forcing Frame is worked by aid of a tanner's bark hot-bed, formed in a pit within-side the whole length. See BARK-BED and BARK-PIT.

This Frame may be formed either of wood or brick-work, and fronted, &c. with sashes of glass like the former; the length may be ten, twenty, or thirty feet, or more; eight or ten wide, and six or eight high: and may be constructed either nearly like the dung-heat Frame, six or eight feet high behind, and one in front, the ends conformable, and sloping Frames of glass-work raised from the front, sloping either quite to the top of the back wall, or to incline only about one half towards that part, meeting a tiled roof at top half way, which should be raised high enough in front to throw the water off behind, as well as to admit as much sun as possible to every part of the Frame; or it may be constructed with an upright front of glass, head high, and a sloping roof of glass-work, ranging from the upright front to the

top of the back wall, which is rather the most eligible form, both for convenience and benefit of the plants; either of which constructions may be erected detached, or against a south wall already built, which will serve for the back, and save some expense; the ends may either be of wood or brick, but would be much better if glazed like the front, &c. and the glass-work in every part should be made to move on and off, as well as to slide backward and forward to give air, and to do other necessary work; and at one end, near the back wall, may be a door to enter occasionally; and within-side must be a pit for the bark-bed, three feet deep, part sunk, the greater part raised, continued the whole length and width, except about a foot and half alley to go in to perform the necessary culture, as well as to view and gather the produce of different plants.

The pit within is to be filled with new tan any time in winter or spring, you intend to begin forcing, though January is soon enough, and the beginning of February is not too late; the bark will support a growing heat three months, and if then stirred up to the bottom, will renew its heat, and continue it two months longer.

In this Frame may plunge in the bark-bed pots of roses, or any other choice flowering shrubs you would force into an early bloom; likewise may place pots of strawberries towards the front and top glass; and pots of kidney-beans and early dwarf peas may be placed in any part of the Frame; also pots of dwarf fruit-trees, before mentioned, pots of double pinks, carnations, and any other moderate-growing fibrous-rooted perennials, as well as any sorts of bulbous or tuberous-rooted flowers, as narcissuses, jonquils, tulips, anemones, ranunculuses, and various other sorts.

The heat of the bark-bed will effectually warm the earth and internal air sufficiently to forward any sorts of hardy flowers and fruits to perfection at an early season; observing, that, although they do not always flower and fruit so abundantly as in the full ground, yet, if there is but a few of any sort, a month or two before their natural season, they, if for sale, will sufficiently pay; and if for private use, they will always be acceptable as a rarity and curiosity in the family.

Fresh air must be admitted in fine sunny days at all opportunities, by sliding some of the glasses more or less open, keeping all close on nights.

Give water also occasionally in moderate quantities.

When the heat of the bark declines considerably, do not omit forking it over to the

bottom; which will revive the decaying heat six or eight weeks longer.

A bark-heat Forcing Frame, nearly of the above dimensions, might be contrived entirely for forcing fruit-trees, having a border within-side along the back wall three or four feet wide: there plant young bearing dwarf fruit trees of any sorts before mentioned, at six or eight feet distance, in the manner of wall or espalier-trees, training them also in the same manner as directed for the respective sorts in their natural state of growth. The bark-pit should here be almost half sunk; and in the beginning of February fill the pit with new tan-bark, which will soon set the trees into bloom, and will ripen their fruit early; and the late sorts of fine grapes, which do not ripen kindly here in the full ground, may by this assistance be brought to perfection.

But the most eligible general Forcing Frame for various sorts of plants is one of the above-mentioned construction, having also flues for fire-heat; the walls must be of brick-work, having two or three returns of flues formed of the same materials, running the whole length of the back wall within, and one or two along the front and ends, by which to convey fire-heat occasionally in severe frosts, cold nights, and in all very cold and intemperate weather; which will be a great improvement in very early forcing, so that this kind of Frame will be nearly of the plan of a stove or hot-house. See HOT-HOUSE.

In default, however, of any of the above kinds of bark-heat Forcing Frames, one might be effected by a common bark-pit (see BARK-PIT), filling it a yard deep with tan, and in which may plunge pots of roses, or any other shrubs, any sort of low, herbaceous, flowering plants, fibrous or bulbous-rooted, kidney-beans, strawberries, &c.

By Fire-heat.

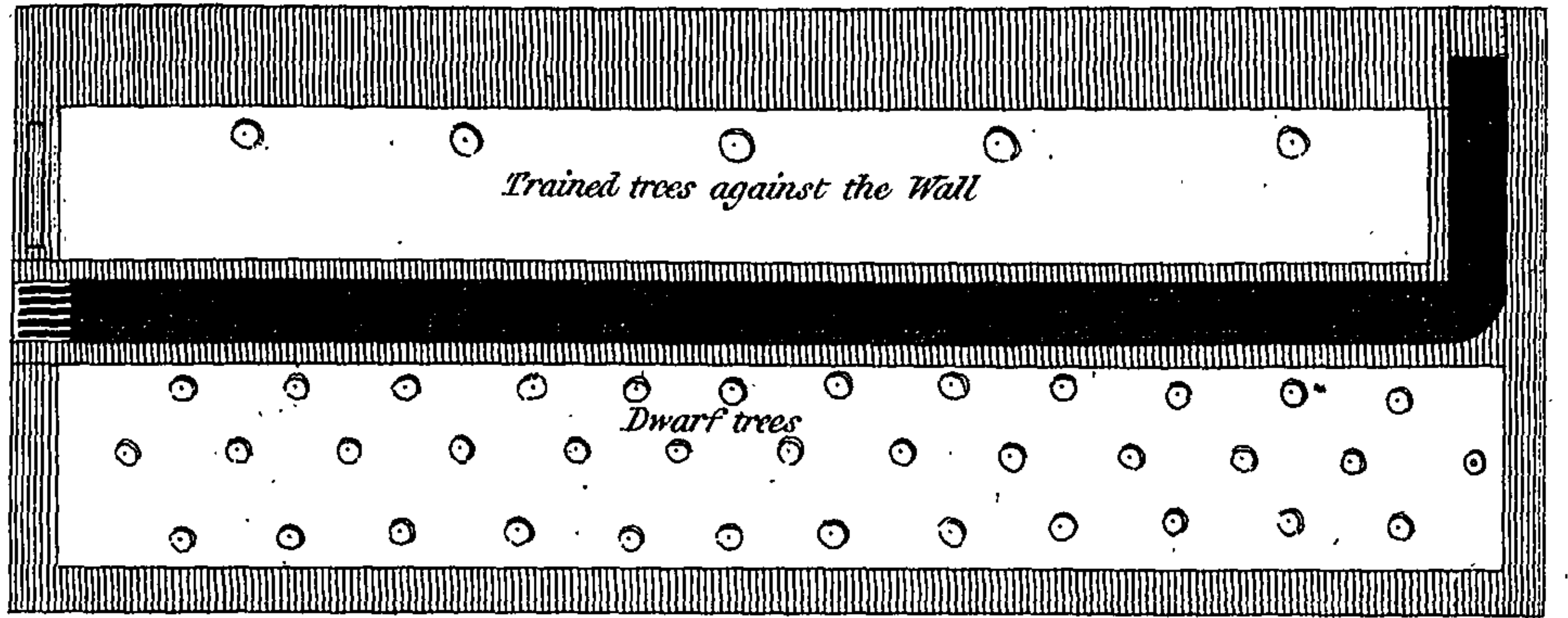
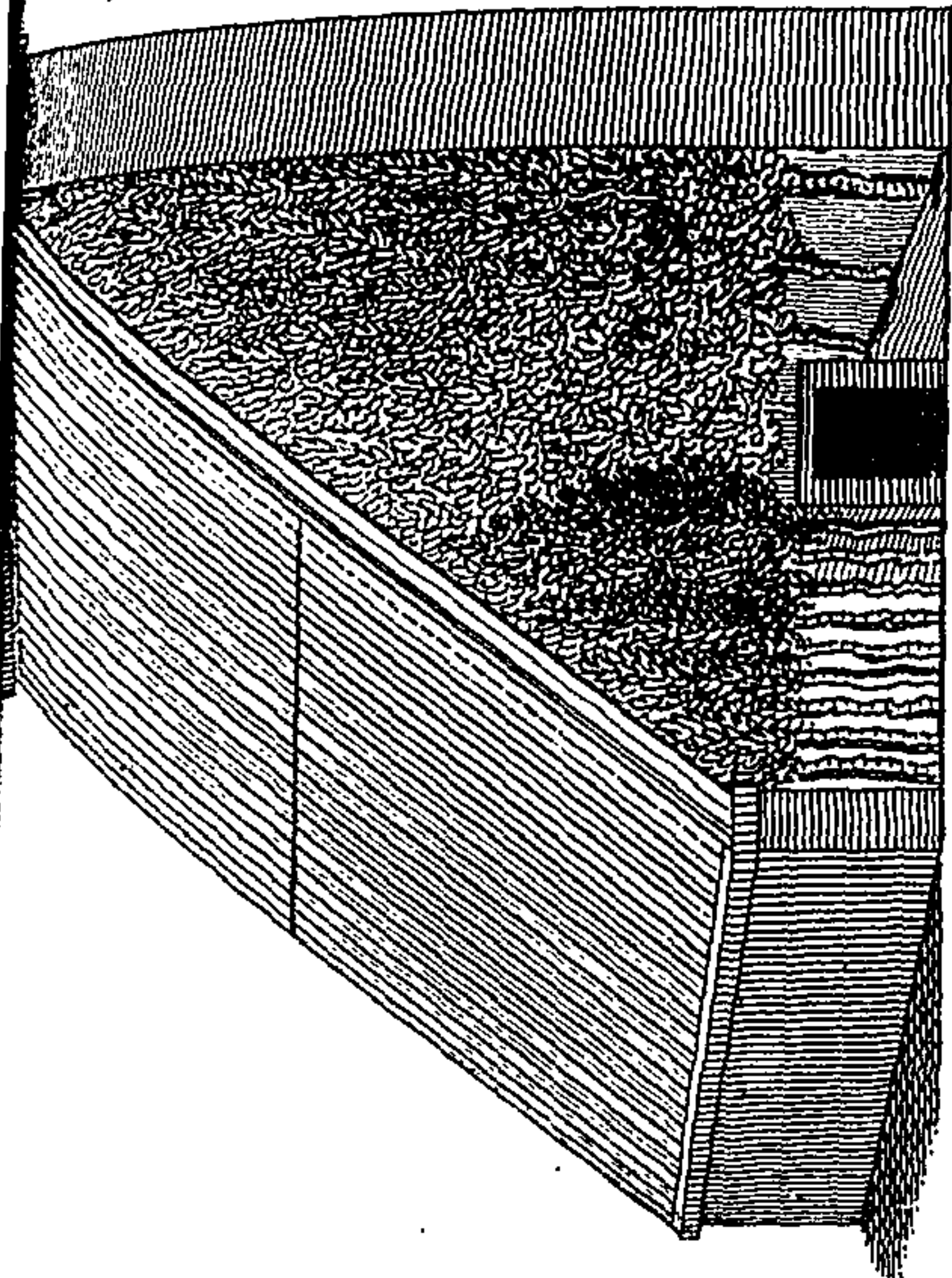
By Fire-heat.—This kind of Forcing Frame is worked by actual fire, burned in a furnace behind at one end or middle, from thence communicating the heat by internal flues or funnels running the whole length of the back wall in three or four returns one above another, and continued in one or two flues in the front, and the frame thus constructed, is often employed for ripening several of the more valuable tree-fruits at an early season; or for forwarding such to perfection, which do not ripen freely in our climate without such artificial aids, particularly some sorts of grapes; and in which Frame the whole bottom space must be good earth two spades deep, for the reception of the trees, &c. for they are to be planted fully in the ground.

This Frame must be formed of brick-work, at least the back or main wall, for the convenience of having fire and flues, and the whole front, &c. must be glass like the other sorts; the length may be from twenty to forty or fifty feet, or more, though one fire will not warm more than that length; the width may be from five or six to twelve or fifteen feet, and eight or ten high. It may be contrived either of moderate width for one row of trees only, to range against the back wall, or may be capacious enough to have a range of trained wall-trees behind, as just mentioned, and some small half or full standards, ranging also from the back to the front, or entirely for standards, especially those of cherries.

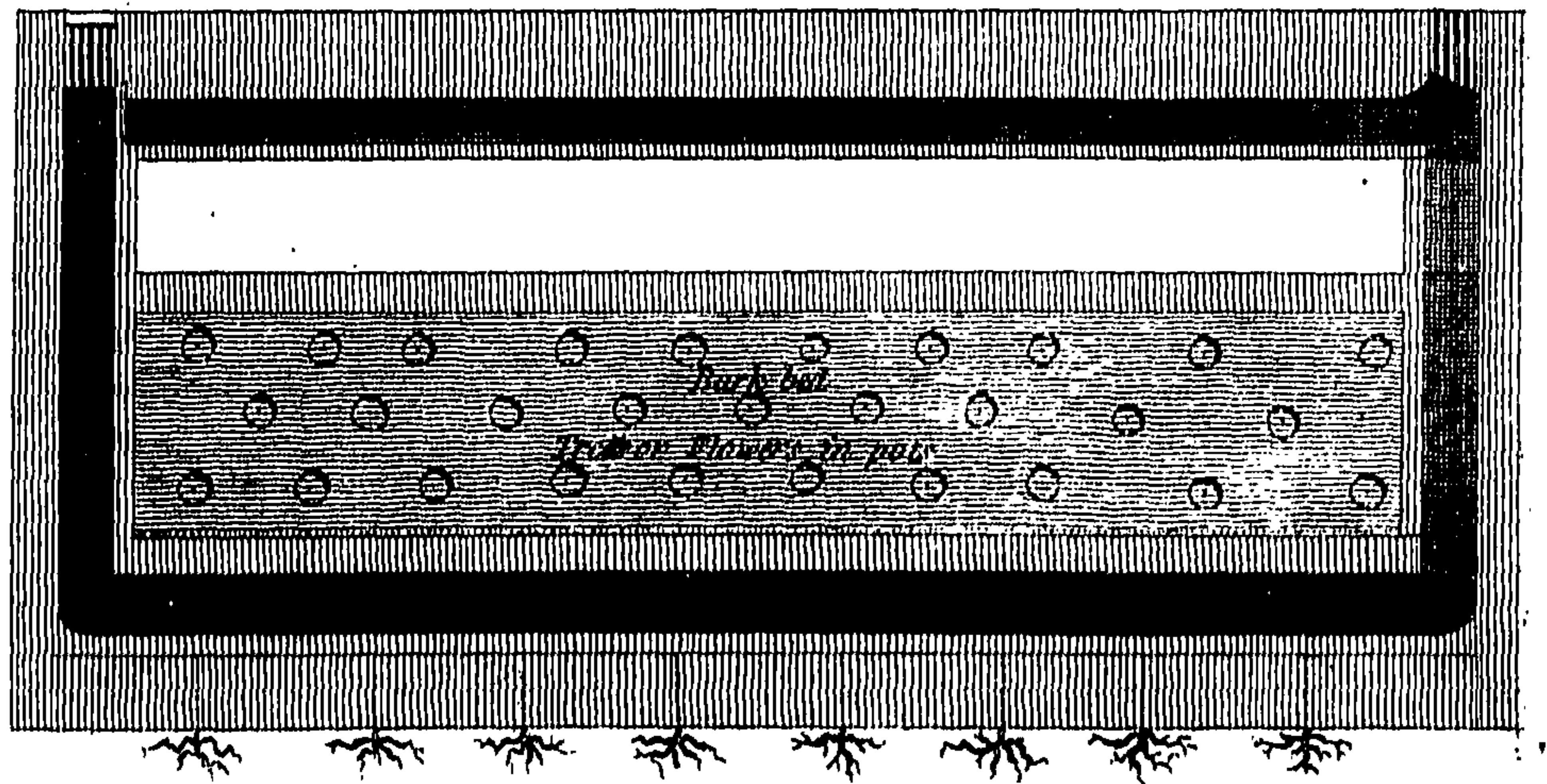
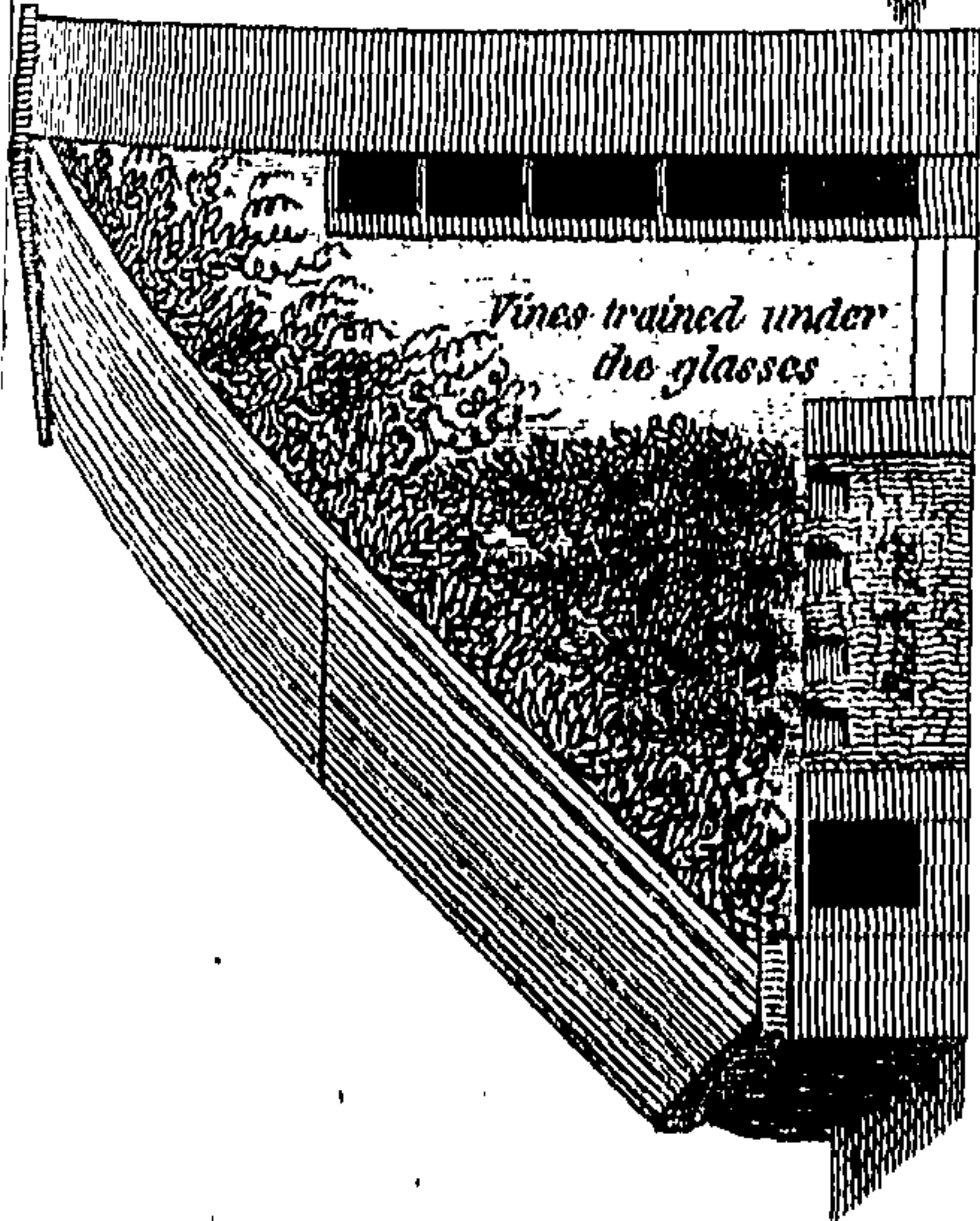
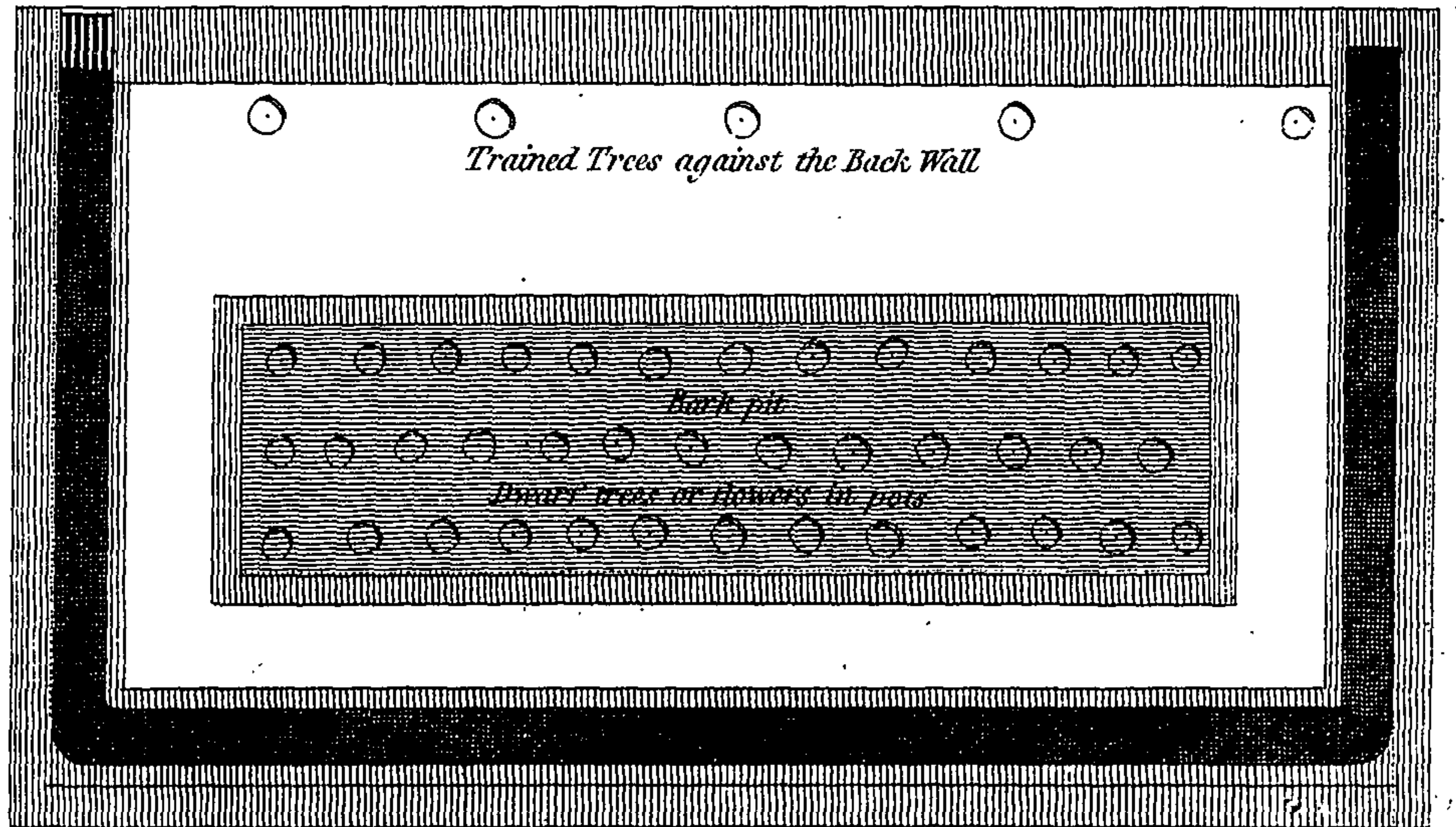
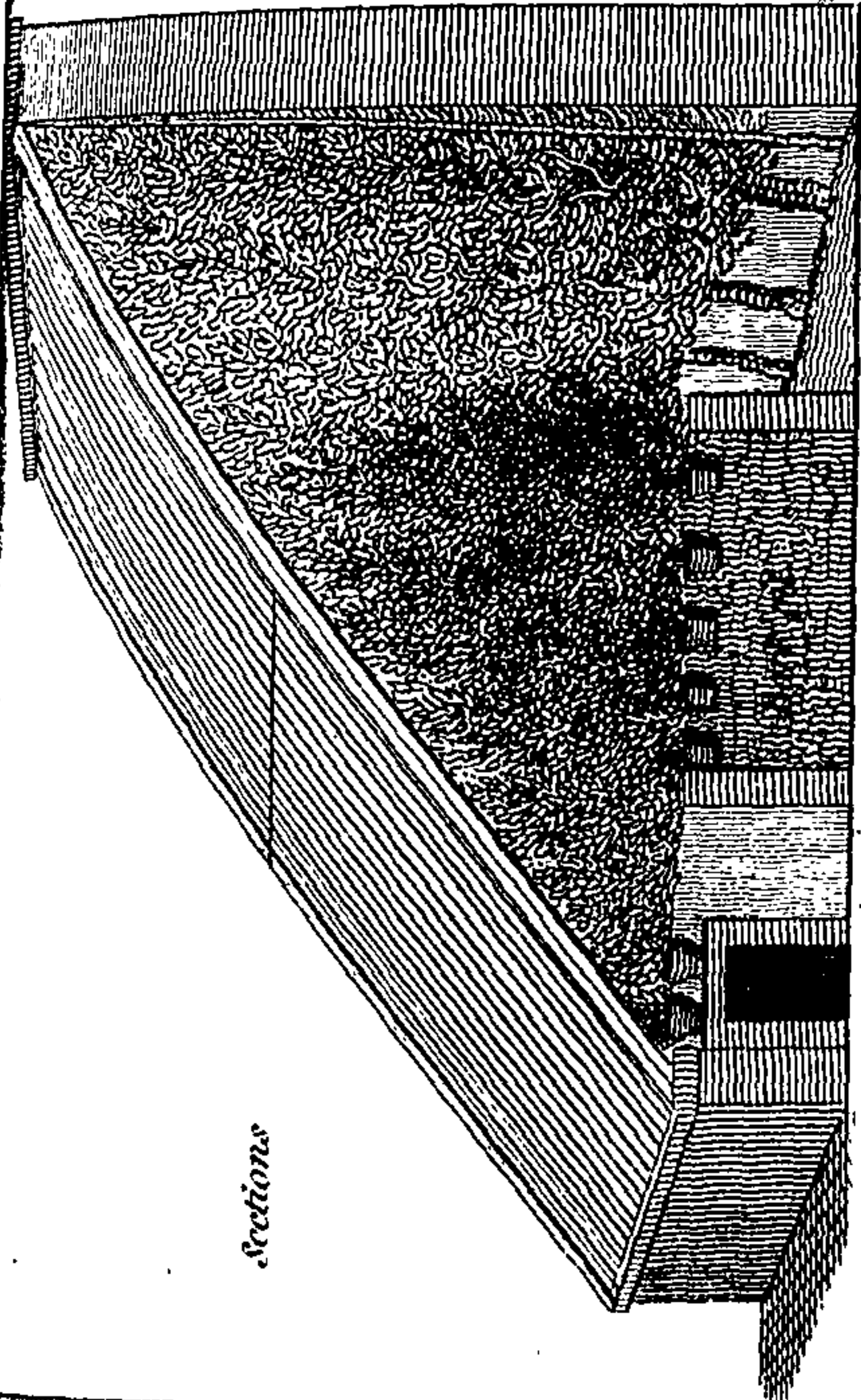
If it is therefore intended to have a narrow Frame for only a row of trained trees behind, the width from four to five or six feet is sufficient, having the back or main wall formed of brick or stone, as aforesaid, eight or ten feet high, with several flues within-side, returned over each other, running the whole length of the wall; in the front must be a low wall a foot high, on which to lay a plate of timber, and from which are ranged glass frames or lights in one continued slope to the top of the back wall, there received into proper frame-work; but for the greater convenience, the lights may be in two tiers or ranges, an under and upper tier, the upper range made to slide up and down over the others, but so as all the glass-work can be moved away occasionally, to admit the full air to the trees after the work of Forcing; the whole bottom-space within this Frame must be of good loamy earth, or any good garden mould, two spades deep, which must be dug or trenched in the common way; then plant a range of trees behind, towards the wall, and two or three yards asunder, erecting a treillis behind them, upon which to train the branches as against a wall or espalier; besides these trees, there may be other inferior plants set in the border or in pots, in front of the trees, as strawberries, dwarf kidney-beans, dwarf peas, mazagan beans, &c. dwarf roses, or the like, that will not rise high enough to shade the fruit-trees in the back range.

A frame of this construction, forty or fifty feet long, may be worked by one fire; but if longer, two furnaces for fires will be requisite. For flues, &c. see HOT-HOUSE.

But to have a more capacious Frame both for trained trees and standards, may be of any length from twenty to fifty feet or more, but must be ten or fifteen feet wide, having an upright back wall of brick ten feet high, with flues as above directed, and a low wall in



Ground Plans



in front one or two feet high, on which is erected upright glass-work, four or five feet perpendicular, and from the top of these, a sloping roof of glass frames, continued to the top of the back wall, supported upon proper bearers three feet six inches distance, having the top glasses in two ranges, an under and upper range, as before advised, both of which, and those of the upright in front, made to slide, and move away occasionally; in this Frame there will be room to walk under the glass-work in any part, and there will be also due room for the trees, both dwarfs and standards; and then having the whole ground-space within of loamy, or other good earth, as in the other Frame, you may plant your trees, some in one range against the back wall, as peaches, nectarines, apricots, grapes, figs, &c. six or eight feet asunder, erecting a treillis for training them upon; and in front of these may be planted rows of young cherries, both in small standards, half standards, and dwarfs; the full standards to have five or six feet stems, the half standards three or four, and the dwarfs one or two foot stems; each sort, both trained trees and standards, to be planted when about from three to four or five years old, as soon as they acquire a bearing state, having regular heads of two or three feet extent at first planting. Having procured the trees, and the ground ready for their reception, may then plant one range of the choicest sorts as before noticed, next the back wall, two or three yards asunder, the others in rows from back to front, at six or eight feet distance, the tallest behind and the lowest in front, at three or four feet distance in each row, making each row range against the intervals of the trained trees behind; or if they are all standards and half standards, there will be more room for several sorts of smaller plants under them; and as their branches will be nearer the top glasses, may be of particular advantage; and in the intervals may be planted some low currants, gooseberries, raspberries, strawberries, dwarf-beans, kidney-beans, &c. But a frame of these dimensions is sometimes planted entirely with standards, more particularly cherries, as being more moderate shooters and soonest arrive to a bearing state, so as to bear any tolerable quantity of fruit; planting them five or six feet distance: sometimes standard plums, apricots, peaches, and nectarines are also planted, and vines to train up under the glasses.

A Frame of these dimensions, twenty-five feet long, may be worked by one fire; but if much more than thirty feet in length, two furnaces for fires, with each its set of flues, will be necessary

With respect to the age of the trees for both the above kinds of fire-heat Forcing Frames, they should be from three to four or five years old, with regular heads of branches, two or three feet extent, and just arrived at a tolerable bearing state; no very vigorous shooters must be admitted, but such only that assume a moderate regular growth, and are trained in the nursery until they have acquired a proper size, each as directed under their respective genera, whether as wall trees or standards; or trees proper for the purpose may be had at all the public nurseries: they are to be transplanted into the Frame in October or November to remain for forcing; but should be permitted to have a year or two's growth here before you begin forcing them, that they may be firmly rooted; during which time all the glasses should be entirely away, that the trees may have the full air till forcing time is nearly arrived; or may occasionally have trained bearing trees, of small sizes, in pots, if they have been in good growth for one season at least, and so removed in their said pots into the frame at the proper season, as above.

In both the above kinds of Forcing Frames, may also plant some grape-vines on the outside of the front glasses in the full ground, and their stems trained through holes, and conduct the shoots along up the inside towards the glass-work to a sort of slight treillis, keeping the branches quite thin; and they will ripen early fruit in great perfection.

It should however be remarked with respect to grapes, that when intended to have in your Forcing Frame any of the large, late kinds, which do not ripen here without the aid of shelter and artificial heat, it will be more advisable to have some in a department by themselves, because they often do not ripen till late in autumn, so often require the glasses to be continued over them occasionally all summer, especially in wet and cold weather; and sometimes, if the autumn proves wet and cold, they require the aid again of gentle fires made on nights, to promote their ripening perfectly; in which cases, were other trees, whose fruit are ripe and gone in summer, planted in the same department, it would force them at an untimely season, and greatly weaken them.

The season for beginning to make the fires for forcing the trees in either of the above described fire-heat frames, is any time in January, though about the middle, or towards the latter end of that month, or beginning of February, is, for the general part, rather the most successful time to begin the general forcing.

ing, to have a good crop; for if the trees are forced very early, there will be some danger of their miscarrying; as, if they should come into blossom, when severe weather prevails, that air cannot be freely admitted, they seldom set any tolerable crop of fruit; therefore, by beginning to make the fires about the time above directed, the trees will be in blossom about the middle of February, when we may expect some fine sunny days for the admission of a moderate portion of fresh air, which is essentially necessary to promote the natural impregnation of the fruit, and improves its free growth; for if kept too close, they are apt to drop off in their infant state.

The fires are to be lighted in the furnace every evening about four or five o'clock, and if kept burning till ten or twelve, it will sufficiently heat the flues to warm the internal air of the house till next day morning, when, if very cold, frosty, or cloudy damp weather, a moderate fire may also be made occasionally; and by no means force the trees too much, for a moderate warmth will prove the most successful; and thus continue the fires occasionally till April or May, but less in proportion as the weather grows warmer.

Fresh air must be occasionally admitted in fine days, by sliding some of the glasses a little open, and, as the trees advance to blossom and fruit, the days grow longer, and the power of the sun greater, allow a greater proportion of air accordingly. Likewise give frequent waterings to the borders.

Thus your trees will be in full blossom in February, and some will ripen fruit in April, and early in May, particularly cherries, and strawberries; you may also expect early apricots, peaches, and nectarines in May and June, plums and grapes in June and July; but the curious large late sorts of grapes, which do not ripen in this country without shelter and artificial heat, will not be ripe till August or September.

After the fruit of the different sorts are all gathered, the glasses should be taken entirely away, that the trees may have the full air during summer; and in December they should be placed upon the Frame again, ready for forcing in January.

With respect to pruning the trained trees, i. e. such that are trained as wall-trees against the treillis, &c. they are to be pruned and trained every summer and autumn, each sort according to its kind, as other wall-trees, and as directed under all their respective articles; and as to the standards, their requisite pruning is principally in autumn, to cut out any irregular growth, and thinning out any crowd-

ing shoots, for the branches must be kept thin and regular, clear of each other, six or eight inches distance; and any stragglers which extend in length considerably, should be reduced to order; and as the branches in general become so long, as to press against the glasses, or spread too much, they should also be reduced a little, to preserve them within due compass; observing always, when shortening the standards, it is necessary to cut to a bud situated on the outside of the shoot or branch, making the cut on the inside; but for particulars in pruning both the trained trees and standards, see their respective genera.

Every autumn, after pruning the trees, the borders must be digged carefully one spade deep.

It must be remarked, that the trees in these Frames, if annually forced, are not so durable nor plentiful bearers, as those in the full air; therefore, when you shall see any become weak, sickly, or bad bearers, others should be ready in training, or procured from the nurseries, to plant in their stead; and in this no time should be lost.

But to continue the same trees more effectually in health, and in a bearing state, some have a double portion of walling and framing planted, but more particularly that of the first described fire-heat Frame, which is sometimes contrived to move or slide along from one place to another, for one Frame-work and glasses to serve two portions of walling, so that being alternately worked, one part one year, the other the year after, each portion of trees will have a year of rest in their natural growth, and will succeed each other in due order for forcing, whereby the health and vigour of the trees will be better supported, and each year a greater crop of fruit may be expected, than if the same trees were successively forced every year.

FOREST TREES, such large trees, both deciduous and ever-green, that grow in woods and forests, either naturally or cultivated, and arrive to timber, and whose wood is proper for any economical purposes.

Of the Forest Tree kind there are twenty or thirty different sorts of deciduous and ever-greens, which may be employed as such, some to grow to large timber for building, others to compose coppices of underwood, to fell every ten, fifteen, or twenty years for various smaller purposes in husbandry, building, and many other trades, as exhibited in the culture of the respective sorts, each under its proper genus; but we have collected under this head a list of all the sorts that may be employed in forming woods and other profitable

able plantations as timber trees, by which any one may see at once the sorts proper for such purposes; and all of which here exhibited are very hardy, and easily raised in the open ground, mostly by seeds, and some by layers and cuttings; and all of them succeed in any open exposure; and as, in the compass of an estate, the situations and soils may be very variable, some parts level, some mountainous, others low, some boggy, some light and sandy, and others loamy, or of a stiff clayey nature, it will be easy to suit any sort according to the soil in which they succeed best, which is always mentioned in their culture; and as such plantations are in general great ornaments as well as improvements to estates, no ground, however barren or unfavourably situated, need lie waste, since there are trees will suit all sorts, and of easy culture; observing, however, we only give the lists here of the proper sorts; and as to their general culture, see each in its respective genus.

We shall exhibit them under two heads, viz. deciduous and ever-green kinds.

Deciduous kinds.

ACER, the *Maple-tree*—common-maple, greater-maple, or sycamore-tree—Norway-maple—ash-leaved-maple.

ÆSCULUS, *Horse-chestnut*—common horse-chestnut.

BETULA, the *Birch-tree*—common birch-tree—*betula alnus*, or alder-tree.

CARPINUS, *Horn-beam*—common horn-beam—flowering horn-beam.

CELTIS, *Nettle-tree*—common black-fruited nettle-tree—purple-fruited nettle-tree.

CORYLUS, *Hazle-nut-tree*—common hazle-tree.

CRATÆGUS, *Wild Service-tree*—maple-leaved service-tree.

CUPRESSUS, *Deciduous Cypress*.

FAGUS, *Beech-tree*—common beech-tree—*fagus castanea*, or Spanish chestnut-tree.

FRAXINUS, *Ash-tree*—common ash-tree.

JUGLANS, *Walnut-tree*—common walnut-tree—black Virginia walnut-tree.

PINUS, *Pine-tree*—*pinus larix*, or larch-tree.

PLATANUS, *Plane-tree*—oriental plane-tree—occidental plane-tree—Spanish plane-tree.

POPULUS, *Poplar-tree*—white poplar, or aspen-tree—black poplar—trembling poplar, or aspen-tree—Lombardy poplar.

PRUNUS, *Plum-tree*, including the *prunus cerasus*, or cherry-tree—wild black-cherry-tree—wild red-cherry-tree—*prunus padus*, or bird cherry-tree.

QUERCUS, *Oak-tree*—common English

oak—willow-leaved oak—chestnut-leaved oak.

SALIX, *Willow-tree*—common white willow—red willow—broad-leaved sweet-scented willow—yellow cultivated willow—pendulous, or weeping-willow—sallow, or oval rough-leaved willow—osier, or long-shooting willow, and several others. See SALIX.

SORBUS, *Service-tree*, *Mountain-ash*—common mountain-ash, or wild *forbus*—sweet or eatable-fruited service-tree.

TILIA, *Lime or Linden-tree*—common green-twiggged lime-tree—red-twiggged lime-tree.

ULMUS, *Elm-tree*—common upright English elm—broad-leaved wych-elm—narrow-leaved wych-elm—Cornish small-leaved elm. See ULMUS.

Ever-green kinds.

BUXUS, *Box-tree*—common broad-leaved tree box—narrow-leaved tree box.

CUPRESSUS, *Cypress-tree*—spreading-cypress.

ILEX, *Holly-tree*—common green holly.

JUNIPERUS, *Juniper-tree*—red Virginia cedar.

LAURUS, *Bay-tree*—common bay-tree, and varieties.

PINUS, *Pine and Fir-tree*—wild pine, commonly called Scotch fir—pineaster, or great wild-pine—stone-pine—swamp-pine—Weymouth-pine—spruce fir-tree—silver fir-tree, and cedar of Lebanon. See PINUS.

PRUNUS, *Plum-tree*—*prunus lauro-cerasus*, cherry-bay or laurel tree.

QUERCUS, *Oak-tree*—ever-green oak—cork-tree.

TAXUS, *Yew-tree*.

THUYA, the tree of life, or *arbor vitæ*—common *arbor vitæ*.

For more species and varieties of some of the different families in the above two lists, see their respective genera.

Of the above list of forest-trees, the principal and most valuable sorts here as timber are the oak, elm, beech, and chestnut, ash, maple, birch and alder, poplar, plane-tree, larch, and the pine and fir-trees; but, as most of the other sorts will grow in any exposure, they might be introduced among the others here and there in composing woods and other plantations for profit: which will assist both in beautifying the estate, and increase the value, as they become fit for the several uses for which they are calculated; some to stand for timber, others for under-wood: among the rest, the willow and hazel should not be omitted; they will grow any where, and will yield no inconsiderable profit; but the oak, elm, ash,

ash, and beech, are the most valuable of all timber-trees in this country.

Most of the above sorts are easily raised from seed in any common ground in the nursery, some also by layers, others principally by cuttings, as alder, poplar, willow, and laurel.

The seed may be sown in autumn, in October, or November, and some in spring, as mentioned under their respective articles; though all the sorts, if the seeds are properly secured till February, may then be sown with good success; when the plants are two years old, plant them either where they are to remain, or in nursery rows, to stand until they are three or four feet high or more, and may then be transplanted for good in autumn or winter into the places where they are to remain, to form a wood, &c. observing, it is advisable to have the deciduous and ever-green kinds principally in separate plantations; and that if designed to have under-wood, for felling occasionally, between the trees allotted to stand for timber, the deciduous kinds are chiefly to be used for this purpose; because the stools of each felling in most sorts, shoot forth again much freer than ever-greens; they may therefore be planted at four or five feet distance, and after eight or ten years' growth, some will be ready to thin for the first felling: ever-green kinds in different plantations may also be planted at the same distance, and as they advance in growth as above, may be thinned out also as under-wood, being careful in the thinning of both kinds, deciduous and ever-greens, to leave enough of the most promising plants to grow up to timber.

But where, in a large extent of ground intended for plantations, to save expense in planting, the seeds are sometimes sown at once where the trees are to remain to compose the woods, having the ground prepared by proper ploughing, drills are drawn two or three inches deep, and three or four feet asunder, the seeds are scattered in the drills, and immediately covered over; then in spring and autumn following, great care must be exerted to hoe down weeds between the rows as the plants come up.

Another method of expeditious planting is, to raise the young plants in the nursery; and after two or three years' growth in the seed-bed, plant them out in rows a yard or four feet asunder, and two feet distance in the rows.

In all large plantations there should be left spacious opens for ridings, to different parts of

the wood, as well as to admit a larger circulation of air to the trees.

In these plantations by either method, great attention is requisite to keep up good fences, and destroy large weeds, by hoeing, &c. till the trees are advanced in growth, and almost ready for the first fall or thinning.

The first fall or thinning for underwood must be determined by the size, intended uses, and demand for the materials; as for example, if for poles or such like purposes, or for faggot wood, &c. they will probably be ready in seven, eight, or ten years, when part may be then cut down; another part the following year; so go on annually, till the whole plantation is cut; by which time the first fall will be grown up and ready to cut again, especially of the deciduous kinds; observing, at each fall, to leave the most vigorous and thriving trees for timber, which may be left pretty close at first, and thinned as they increase in bulk, leaving at least a full crop to grow to large timber-trees, still preserving the stools between them to cut occasionally for underwood, every seven, ten, fifteen, or twenty years, according to the demand, or purposes for which they are intended.

It should be remarked, if intended to plant any boggy or marshy grounds, that alder, poplar, and willow, are the proper sorts; which will grow very fast either by small cuttings, or by large truncheons; elder will also grow freely this way.

FOSSE, a sort of ha-ha, or sunk fence, ditch-like, five or six feet deep, and ten, twenty, or more wide, formed at the termination of particular parts of pleasure-grounds, parks, &c. to extend the prospect.

These kind of fences are often formed at the termination of spacious lawns, grand walks, avenues, and other principal parts of pleasure gardens and parks, both to extend the prospect into the adjacent fields and country, and give the particular parts of a garden an air of larger extent than it really has, as at a distance nothing of the fence is seen, so that the adjacent park, fields, &c. appear to be connected with the garden.

When a pleasure-ground is situated in a park, or paddock, or adjoins to one, or any spacious field open to any agreeable prospects, the Fosse is often continued quite round, as far as the prospect is agreeable, either to the adjacent fields, plantation, water, or any other object appearing to view from the walks of the garden.

These Fosses are formed upon two different plans, both however serving the purpose of a fence,

a fence, and to render the prospect open and airy.

One fort is formed with an upright side next the garden, five, six, or seven feet deep, faced with a wall of brick, stone, or strong post and planking; the other side is made sloping outward from the bottom of the upright wall, &c. gradually with an easy slope to fifteen or twenty feet distance, or if more the better, so as to render the declivity as easy and imperceptible as possible, both to take off all stiff and ditch-like appearance, and that if in a field or park, no ground will be lost, as it may be converted into grass; observing, that the top of the upright side should be nearly upon a level with the adjacent ground of the garden, and always a little higher than the top of the slope on the opposite side, and which should be laid with grass corresponding to the adjoining garden-ground, unless it is thought convenient to continue a gravel walk that way; in which case, always preserve a proper verge of grass between the walk and the edge of the Fosse; the sloped side should also have its top always nearly on a level with the adjacent ground of the field, park, or part where it is formed; and that the side being finished with a regular slope from top to bottom, it should also be sown or laid down in grass, which will preserve the slope always in due form, and at all times appear decent and agreeable to the sight.

In forming this kind of Fosse, if, by reason of wet you cannot go deep enough to form the upright sufficiently fenceable against men and beasts, a *chevaù-de-frise* of wood-work may be erected along the top, projecting outward in a nearly horizontal position, or as much so as to rise but very little above the level of the top of the perpendicular side on which it is fixed, that it may not obstruct the view, or be very perceptible from the garden.

The next sort of Fosse is formed with both sides sloping, and in perpendicular depth from four to five or six feet, having a fence near that height arranged along the bottom; the sides may be sloped gradually from the bottom to ten or twenty feet width, or more, at top; for, the more easy and imperceptible the slope, the better, but more particularly on the field side, for the reasons before given; and the sides to be also sown or layed with grass. In this kind of Fosse, as both sides being sloped, consequently a fence along the bottom is necessary as a defence against cattle, &c. which may be either strong paling, or any kind of palisado-work, the height in proportion to the perpendicular depth of the Fosse,

for the top should not be higher than that of slopes.

The method of forming both these kinds of fences is as follows:

If it be designed to have the first described Fosse, i.e. one side perpendicular, the other sloping, proceed thus: set out the intended width by two ranges of short stakes, then level in the stakes by notching, according to the intended height of the top on each side, corresponding with the adjacent ground as aforesaid; and then make up both the top lines with earth firmly, according to the line of level marked on the stakes; this done, then close along the side of the line of the intended upright side, proceed to dig a trench three feet wide, perpendicularly to the intended depth of the Fosse; as you go on, work also the sloping side gradually down, still continue digging the trench perpendicularly next the garden, &c. till arrived at the proper depth; then level the bottom equally along according to the lines of level at top, and having proceeded so far, then, according to the line of level at top and bottom, trim and finish off the sloping side regularly, so as to form an even slope from the outside line at top, to that at bottom: as to the upright side, a wall must be erected to the height of the line of level at top; making good the ground behind the wall, firmly, as the building advances; and finish the top with a coat of turf level with the adjoining ground; at the same time finish also the slope, either by sowing it with grass-seed, or laying it with turf as shall be most convenient.

To form the other sort of Fosse with both sides sloping, set out the width by two lines of stakes, level them in, and make up the ground of each line according to the mark of level, as directed before in the former; then exactly along the middle, between the two lines of stakes, dig a trench two or three feet wide, to the intended depth of the fence, sloping each side a little as you go on, still continuing the trench perpendicularly, till arrived at the due depth; then, as in the former, level the bottom an equal depth, by stakes, agreeable to the lines of level at top: when this is effected, finish off both slopes evenly from each line of level at top, to that at bottom, and sow each slope with grass, or lay them with turf, as you shall think proper; and with respect to the fence along the bottom, it may be either close paling, rails, or palisadoes, as is most convenient, the height proportionable to the depth of the Fosse, but not to be higher, or at least but very little above the line of level at top of the Fosse.

FOTHERGILLA, a genus consisting of a low-growing, under-shrub, with oval leaves, and polyandrious flowers.

Class and order, *Polyandria Digynia*.

Characters.] **CALYX**, a short, monophyllous, bell-shaped, permanent cup. No **COROLLA**. **STAMINA**, many long, slender filaments, topped with small, erect, quadrangular antheræ. **PISTILLUM**, an oval, bifid germen, two awl-shaped styles, and simple stigmas. **PERICARPIUM**, a hard, bilobate capsule, with two cells, containing bony seeds.

The species is,

FOTHERGILLA alnifolia.

Alder-leaved Fothergilla.] Hath very spreading roots, sending up numerous slender stalks, ten or twelve inches high, oval, obtuse, or indented leaves, hoary underneath, on short foot-stalks, placed alternately, and at the ends of the stalk small, whitish flowers growing in spikes, coming out in May and June.

Varieties.] Broad-leaved Fothergilla—narrow-leaved Fothergilla—acute-pointed.

These are hardy plants, and ornamental for the front of the shrubbery among other low growers. Their propagation is easily effected by parting the roots in autumn or spring.

FRAGARIA, the strawberry plant.

The plants are low, herbaceous, hardy perennials, growing in large leafy tufts, close to the ground, producing slender annual stalks a few inches high, crowned by many beautiful fruit of admirable fragrance: hence it derives the generical title *Fragaria*.

Class and order, *Icosandria Polygynia*.

Characters.] **CALYX** is monophyllous, plane, and ten-parted at top. **COROLLA**, five roundish, spreading petals, attached to the calyx. **STAMINA**, twenty or more short awl-shaped filaments, and moon-shaped antheræ. **PISTILLUM**, numerous germina, collected into a head, and many styles, having simple stigmas. **PERICARPIUM**, none, but a roundish large soft receptacle, or fruit, having numerous small sharp-pointed seeds scattered over its superficies.

There is but one real species of the common strawberry, which is comprehensive in many varieties of its fruit.

The species are,

I. **FRAGARIA Vesca**.

Eatable, or Common cultivated Strawberry.]

Fragaria with a thick fibry root, crowned by a large cluster of three-foliod, oval-lobed leaves, many trailing strings or runners rooting and forming plants at every joint; and amidst the leaves several slender flower-stalks, six or eight inches high, crowned by a clus-

ter of small white flowers, succeeded by large roundish berries of different sizes and colours in the varieties.

The principal *Varieties* are:

Wood Strawberry (Sylvestris). Having oval sawed-leaves and small round fruit, and of which there are—red-fruited wood-strawberry—white wood-strawberry—greenish pineapple-tasted wood-strawberry—double-blossomed wood-strawberry—and with gold striped-leaves—silver-striped leaves.

Scarlet, or Virginia Strawberry (Virginiana). Having oblong-oval, sawed-leaves, hoaryish underneath, and a roundish scarlet fruit; and of which there are—common scarlet strawberry—roundish-leaved large scarlet-strawberry—striped-leaved scarlet-strawberry.

Hautboy, or Musky Strawberry (Moschata). Having larger, thicker, hairyish, oval-lanceolate, rough leaves, and large, pale-red fruit; of which there are—oval-fruited hautboy-strawberry—globular-fruited hautboy—pine-shaped hautboy—green-fruited hautboy—red-blossomed hautboy—white-striped-leaved hautboy—yellow-striped-leaved hautboy.

Chili Strawberry (Chiloensis). Having largest, thickest, hairy leaves, large flowers, and very large firm fruit; of which there are—round, pale-red Chili strawberry—globular pale-red fruited—oblong-oval pale-red fruited—deeper-red fruited—Carolina scarlet-fruited—white-fruited—royal large red—large Dutch—Bath Chili Strawberry—Devonshire Chili Strawberry.—All of which are remarkably large, firm, fleshy fruit, of paler and deeper reds, &c. in the different varieties, beautiful and fine-flavoured, when produced in the full sun; the plants of these Chili strawberries were first introduced into Europe from Chili in America; they are considerably the largest fruit of all the strawberry kind, though not always good bearers; but I have sometimes had them bear wonderful great crops, even superior to the scarlet kind; and for the singularity of their large beautiful fruit, should never be omitted in the strawberry collection.

Alpine, or Monthly Strawberry (Alpina). Having small oval leaves, small flowers, and moderately-sized, oblong, pointed fruit, of which there are—scarlet Alpine strawberry—red Alpine strawberry—white Alpine strawberry—scarlet blossomed strawberry. These varieties grow naturally on the Alps; they possess this singular property more than the other sorts, that all the young plants, formed every summer upon their runners, shoot up into flower and fruit the same year, whereby a fresh crop of fruit is continued monthly in the old and new plants, from June until October,

or

or November; the plants are always great bearers, and prosper any where, and the fruit is of a fine poignant agreeable flavour.

Pine Apple Strawberry (Ananassa). A middle-sized, somewhat pyramidal fruit, pine-apple-tasted; consisting of the green-fruited—red-fruited — hautboy-fruited — chili pine-apple strawberry.

All the above varieties of *Fragaria* are hardy low perennials, durable in root, but the leaves and fruit-stalks are renewed annually in spring; the leaves of all the sorts are trifoliate, or of three folioles, growing in a large tuft immediately from the root, and between them the flower-stalks six or eight to ten or twelve inches high: shooting up to flower in May and June, and their fruit arrive to perfection in June, July, and August, and which, in the Alpine kind as aforesaid, continue till the beginning of winter. They all prosper in any common garden soil, producing abundant crops annually, without much trouble, and increase exceedingly every summer, both by off-sets or suckers from the sides of the plants, and by the runners or strings which are produced numerously, extending two or three feet along the surface of the earth, rooting therein and forming new plants at every joint; and in both of which (the suckers and runners) may be detached for planting either the same summer or autumn, or ensuing spring; but those planted early the same season will have a better chance of bearing some tolerable fruit the succeeding summer, especially some of the first formed runners or strong sucker off-sets; however, the whole, both of the runner and off-set plants, will produce fruit in some tolerable abundance the second year, and arrive to a full bearing growth in great perfection the third season, and continue in an improved bearing state several years: though young plants of the Alpine strawberry, planted out soon after they are formed, bear fruit the same season, as will also the runners of them; for this sort is the most prolific of all the varieties of *Fragaria* yet known, as not only its runners form plants at all the joints as they advance in length, like the other sorts, but the same young plants, as before observed, shoot up into flower and fruit, and the fruit also attains good perfection the same season; but in all the other sorts, the young plants rarely produce fruit until they are one year old, and sometimes not till they have two years' growth.

Strawberries being desirable summer fruit of the earliest maturity of the berry kind, and the plants easy of culture, plentiful bearers, and propagate and multiply most abundantly,

a collection of the approved principal varieties of different sorts highly merit culture in some plentiful degree in every garden, both kitchen and pleasure-ground, &c. planted in any common fertile soil and free situation, or principally in a sunny exposure, to ripen the fruit in the richest full flavour; and generally arranged in beds and borders in rows lengthways, twelve to fifteen or eighteen inches asunder by the same distance in the lines; or some disposed also in a single row, along the edge of particular borders or other compartments; in which they will effect an agreeable variety, and bear abundantly in excellent perfection; likewise may have patches dispersed in the flower-borders and front of some shrubby clumps, &c. where their flowering and production of fruit will show a pleasing diversity, as well as profitable for the fruit to gather; and some sorts may be planted in shady situations, particularly a portion of the wood Strawberry, which, being naturally a wood plant, will succeed in shadyish places near the umbrage of trees, shrubs, and bushes: but it is also proper to have a principal assortment, both of these, and more particularly of all the other varieties, planted in more open sunny exposures, or aspects, whereby to ripen their fruit earlier and full flavoured.

For it may be observed, that although all the varieties of Strawberry plants will prosper in growth in any common situation, they are always more superiorly fruitful, and ripen the fruit earlier in the best perfection and richest flavour in a free exposure open to the full sun: so that some may be disposed in south borders, or any good sunny aspect, for earlier production; a principal supply in any open compartments in beds or borders for the main crops; and some planted in west and easterly aspects in beds, borders, &c. to ripen fruit later in regular succession.

And generally, in the different orders of planting Strawberries, it would be most advisable to keep the plants mostly stringed or divested of the rankest part of the runners, thereby to continue each stool separate, or singly in a distinct bunch, as it were; in which they will both have a better appearance of good culture, and the fruit will always be superior: or having any planted as an edging, they should be constantly divested of all runners in summer, that they may not over-run the adjoining walks, paths, or alleys, and borders, &c.

As all the varieties of Strawberries furnish an abundant off-spring in young plants annually, proper for any intended plantations as above, increasing exceedingly in summer, both

by runners extending along the earth, forming a new plant at every joint, and also by off-sets round the sides of the mother plants; they may be detached for planting the same year in summer or autumn, or spring following; but those planted off early the same year will bear a few fruit the following summer; all of them in tolerable plenty the second, and in full perfection the third season.

A plantation of Strawberries will support a good, plentiful bearing state several years; they generally begin bearing tolerably in two years' growth after planting; but in considerable abundance and perfection the third season; and continue fruiting plentifully four or five years, or more; though after that period they sometimes begin to decline in some degree, both in the quantity, size, and goodness of the fruit; for although plants of much longer standing may appear in a free-growing state, and blossom in tolerable plenty, those of very old growth often become sterile, i. e. the flowers blind, as expressed by the gardeners, in being deficient in some of the generative parts, either the stamina or styles, or the antheræ or stigmas thereof, being the male and female fructifications, whence no complete impregnation in the latter is effected, and consequently but a small production of fruit succeeds, and that generally much inferior in size, regularity of growth, and flavour; therefore on these appearances a fresh plantation should be made in proper time, according as you shall see occasion, agreeably to the above intimations.

And in making any fresh plantation, we should be careful not to have the young plants for that purpose taken from any very old stools of considerable long standing, in which the plants may be of a declined unprolific state, but always, if possible, from younger plants of a full-bearing growth; as those taken from worn-out old plants will, in some degree, inherit the deficiency or sterility of the parent, and never become good bearers.

In all the varieties of Strawberries, the plants are perennial, and of hardy growth to succeed in the full ground and open air in all seasons; and although they are sometimes a little deranged in winter by rigorous frosts, they recover effectually in the spring, and produce fruit in perfection in summer.

Respecting the properties of the different varieties of Strawberry, the wood Strawberry is the smallest fruit, the plants free-bearers, and the fruit is in estimation for its peculiar tartness of flavour, particularly to eat with cream, &c. the scarlet is a larger fine fruit, ripens earlier, and of a richer flavour; the

hautboy is much larger than the scarlet sort, firmer fleshed, and musky flavoured; the Chili kind is considerably largest of all the sorts, beautiful and fine-flavoured, if produced in the full sun; the Alpine sort is a smallish fruit, but has peculiar merit, both as a fine tartish-eating strawberry, and for being obtained in longest succession; the plants surpassing all the others in their long continuance in bearing, generally from June till September or October, effected by the young runner plants of the year, fruiting, as they are formed on the advancing runners the same season; and the pine-apple Strawberry is nearly the size of the scarlet, but more tapering pyramidally, and pointed at top; the plants very prolific, and the fruit of a rich vinous taste; somewhat resembling that of a pine-apple.

In their order of production, the scarlet and Alpine sorts ripen earliest, the hautboy and wood Strawberries next in succession, and the chili and pine-apple kinds ripen immediately after; but all the sorts attain perfection in June and July till August; and the Alpines continue in succession long after all the others.

But ripe Strawberries are also obtained at a much earlier season by means of artificial heat of hot-beds, hot-houses, and forcing-houses, &c. in which, the plants being introduced in January and February, they produce ripe fruit in March, April, and May, continued in succession till those in the natural ground are produced and arrive at maturity. See their culture in HOT-BEDS and HOT-HOUSES.

Propagation and Planting, &c.

The propagation of strawberries may be effected by seed, to obtain new varieties; but the common method of propagation is by young plants which all the sorts furnish abundantly, both by off-sets from their sides, and runners or strings, which rooting as they extend along the surface of the earth, form plants at each joint, and those, both of the off-sets and runners, become proper plants the same year, fit for forming a new plantation, either the same season, in summer if required, or in autumn, or the following spring, as may be convenient; always making choice in the off-sets, of those young suckers which grow on the outside of the mother plants; and of the runners, generally prefer those which are first formed near the mother stool, as being strongest; and as these runner plants are always very abundant, they commonly furnish a principal supply for plants, though the off-sets or suckers are equally eligible for that occasion; all principally of the same summer, or not more than the second summer's growth; and

those first formed in that season are excellent for planting the same year, and next spring; or if a quantity is planted off in summer in a shady border in a nursery way, they will make fine strong plants for final transplanting in September or October; and will produce some fruit the following summer.

The season for this work of planting strawberries is spring, summer, and autumn; the spring planting may be performed in February, March, or April, or as soon as the plants have recovered themselves a little after the casual ravages of winter, and the last summer's progeny of runner and off-set young plants have made some progress in their top growth: or the summer planting may be effected in June, July, or early in August, of the young runner and off-set plants of the present or last year; planted either in a shady border till autumn, as before suggested, or at once where they are finally to remain; and the autumn planting may be performed in August, September, or not later than October, that the plants may have time to strike good root before winter; but the sooner in the season the autumn planting is completed, the better, as it will make a material advantage in the growth of the plants.

However, if omitted performing a summer or autumn planting, it may be done in spring; but I greatly prefer an early autumn planting; for the plants will be much stronger and better prepared to produce fruit the following year, which is rarely the case with the spring-made plantation; but to have a supply of as good plants as possible, it is proper, in June, July, or beginning of August, to take off a quantity of the first-formed runner young plants, particularly those formed nearest the parent in the first two or three joints of the runners, raising them up carefully with fibres, and trim off all the strings or running part, then plant them in a shady border by way of nursery, six inches apart, give a good watering, and repeat it often in dry weather; and by September or October they will be strong and form fine stocky plants, in much finer order for planting out for good, than those that remain till that time in the beds. If you however should omit the above method, I would advise, if possible, in August or September, to take opportunity of showery weather, and make a plantation at once in the places where they are to remain; but by no means be later than October, otherwise the plants will not take root sufficiently before winter, and, in that case, will be liable, some to be thrown out, others forced into the ground during that season, by the weather and vermin; and at

any rate will be so weakly in spring, as not to produce any fruit the ensuing summer. As to a spring plantation, it may be performed, if thought convenient, when omitted in autumn; but the plants will scarce produce fruit that year; they however will have the summer before them to acquire strength before winter, so as to be able to produce a tolerable crop of fruit the next season.

In the choice of the plants for making your plantation, by no means take them from very old beds, but such that are in the second, third, or fourth year of their bearing, and that are remarkable for bearing plentifully, because, as before noticed, some old plants may appear very healthful, and flower strong, yet produce but very little fruit, occasioned by most of the flowers being deprived of great part of the generative organs; observing likewise, in taking off the young plants of suckers or off-sets growing immediately close about the mother stools, to chuse those situated quite on the outside, and that are only of one or two summers' growth, rejecting such that have knobby hard roots; and of plants produced from the runners, chuse principally those robust ones which grow next the parent plant; those at a distance toward the extreme part of the runner are not near so proper; being careful to raise them up with as much root as possible, trim off all stringy parts, broken leaves, and straggling rooted fibres; and they are ready for planting.

A free situation open to the full sun is rather necessary for these plants, principally to give the fruit flavour; though, for the sake of continuing a longer succession, some of the wood, scarlet, and Alpine kinds may be planted in different exposures, to have more or less sun.

With respect to soil and its preparation, all the sorts will succeed in any common garden earth, as before observed; but if it is inclinable to a loamy nature, it will be a particular advantage; however, be in no great anxiety about soil: take what your garden affords, either in one of the main quarters of the kitchen garden and formed into beds, or in any of the borders thereof; or occasionally in the pleasure-ground for variety, or as required; and in either of which, if the soil is rather poor, apply a good portion of rotten dung, and dig the whole one spade deep.

Then, if intended to plant in beds, divide the ground accordingly into beds four feet wide, with two feet wide alleys between bed and bed, for the convenience of having always sufficient room to go in to hoe, dig, weed, water, and gather the fruit; but do not form the

the alleys deep, only just tread them out by line, then rake the beds over, and line the edges straight.

But it would also be proper to prepare for planting some in borders, adjoining some principal walks, or where convenient, or some in a south border under a wall for earliest fruit; others on a westerly or east border, or some to plant in any detached borders both in the kitchen garden and pleasure-ground, and some to plant in a single row along the edge of some borders, or that of any interior main quarter or other compartment; and thus may have them in a varied order, in which they will be both profitable and ornamental in their productions.

Having the ground and plants ready, then proceed to plant them by line and dibble, in rows lengthways the bed or border, fifteen inches distance for the wood, eighteen for the scarlet strawberry, hautboys, and Chili kinds; I would also advise the rows of Alpine strawberries to be a foot and a half distance; for although the plants are of more humble growth than the three last mentioned, yet, as they send forth many runners, and as these are prolific the same season, let them have room, that their runners may have full scope to root and fruit as they advance; and thus by allowing all the sorts proper extent of room, you will find your account in the size, quantity, and quality of the fruit; and to give them still greater scope, let each sort be planted in the quincunx order; and if intended to have any in the manner of an edging, plant them in a single row along the edge of the allotted border or other compartment, twelve or fifteen inches distance in the row.

As soon as planted, let them all have a plentiful watering, to settle the earth close about the roots, which repeat occasionally in dry weather for a week or two, till they have taken good root.

The first season of planting requires nothing material to be done, more than lightly hoeing between the plants to destroy any advancing weeds, in summer and autumn, clearing away also all the rank crowding runners from the plants, giving the whole a general clearing in the same manner in September or October, to remain in neat good order all winter; then, in spring following, in February, March, or April, go over all the ground with a hoe, both to cut up all weeds, and to loosen the surface about the plants; and as in April, May, and June, and during the summer, all the sorts increase considerably by off-sets, as also by their numerous strings or runners, advancing a considerable distance, rooting

and forming plants at every joint, so as to overspread the ground, and greatly crowd the principal plants if not displaced; therefore, according as these runners are produced, it would be of particular advantage to divest the plants of the grossest of them, which will greatly strengthen the crop, and promote fruitfulness both in quantity and size, and the fruit will ripen in greater perfection; let them, however, at any rate, be cleared from all runners in autumn, cutting them away close to the plants; hoeing and loosening the ground between them, and clear off also all weeds, and then they will remain clean and decent until the return of spring again, when the work of hoeing the beds and stringing the plants must be occasionally repeated during summer and autumn; which operation should be performed every year; and if, in every autumn after the first, the alleys of those in beds are dug, and some earth spread between the plants, it will prove very beneficial, as hereafter directed.

They will sometimes produce a few fruit the first summer after planting; but in the second and third year of their growth you may expect a general blossom and full crop of fruit.

Every summer, when the plants are in blossom, if the weather should then prove dry, good watering occasionally will prove very beneficial in promoting a plentiful production of fruit in good perfection; but when a showery season happens at that period, it both saves the trouble of watering, and an abundant crop generally succeeds; though in the full growth of the fruit, dry weather, and no watering, is the most favourable for ripening the berries firm and high flavoured.

The ripening of the fruit advances gradually in June, July, and August, continuing in succession, in different sorts, six weeks or two months, though in the Alpine kinds, it is often continued from June till the beginning of winter.

In gathering the fruit, let it always be taken with about an inch of its stalk, pinching it off, and put it in small baskets, not in too great quantities, lest they bruise one another.

General Culture in the different Seasons.

In the general culture of strawberries, it would be advisable in some of the principal sorts, or as much as convenient in the whole, to keep the plants mostly to single or distinct bunches on each main stool; and in their general management will require a spring, summer, and autumn dressing, agreeable to the following directions.

Every

Every spring, in February, March, or early in April, clear off all remaining runners of the former year, with all weeds and decayed leaves; then, where the plants are continued single or in distinct bunches on each main stool, as before observed, it would be good culture to loosen the earth between, either by a good hoeing or lightly digging with a small spade; or also to those in beds, to dig the alleys between, and cast a small portion of the earth over the beds between the plants; and this in the whole will greatly encourage their future growth, and production of a good crop of fruit in the best perfection; or however, if the plants are not kept single, but permitted to run over the beds, clear off all rubbishy runner strings, weeds, and decayed leaves; and it would be of advantage to spread some loose earth thinly over the beds or borders, and lightly rake the surface even.

In summer clear off all advancing weeds constantly according as they appear, and where the plants stand distinct, hoe carefully between them in the early part of that season, just to loosen the earth, which will beneficially encourage the flowering and fruiting; and as, in this season, numerous runners will advance from all the plants, it is proper, in those intended to be continued single, to clear away all the rankest or the whole of the said runners, not wanted for future increase to plant; and it would be of advantage, where opportunity suited, to clear the grossest runners away in general, as much as possible, all the fore-part of summer, until the fruit has obtained its growth; though, in large plantations, this would not be always conveniently practicable; but in small crops, or especially if only in some principal sorts, it might be more easily accomplished, and will always show good culture, and prove beneficial to the increasing growth and superior maturity of the fruit.

But in the Alpine strawberry, which, as before observed, produces fruit on the same year's runner plants, the after runners may be permitted to continue in their growth to furnish a succession of autumnal fruit.

Likewise observe in this season, that in May and June, when the strawberry plants are in blossom, and the young fruit advancing in growth, if dry, hot weather, to give some good waterings occasionally; but when the fruit is nearly at full growth, water no more, that they may now ripen with all possible good flavour, which by much moisture at this time would be greatly diminished; so that if dry weather occurs when ripening, the fruit will be much superior in flavour than in a rainy

season, and not liable to rot, as in very wet weather.

In some of the more estimable sorts, or any curious large varieties, when ripening, it would be eligible either to tie up the stalks with the bunches of fruit thereon to sticks, or some the leaves and stalks together; so as, in either way, to elevate the fruit from the earth, more out of danger of rotting by wet if a rainy season, and it will more effectually enjoy the full sun to ripen with a good flavour, or sometimes may place flat tiles on the ground round each plant of a few particular sorts, for the fruit to rest upon, drier and more secure from rotting by the damp of the earth; and to ripen with an improved flavour.

According as the strawberries ripen in June, July, &c. they should be gathered daily; in which they should be plucked off by the stalk each in its calyx or cup, with about half an inch of the stalk adhering, as thereby they are not so liable to be bruised, appear more decent and agreeable when served to table, and at which can be more agreeably picked up out of the dish or basket for eating; though the wood strawberries, in particular, are very commonly gathered without any stalk part, generally picked clean out of their cups, especially when designed to eat them with cream.

In autumn, when the fruit in general is gone, any time in August or beginning of September, it would be proper to give the beds, &c. a last general dressing for the present year; cutting down all the old leaves close, and rake them away; then, where designed to continue the plants single, trim off all remaining runners, agreeable to the foregoing intimations, when not wanted for young plants, or occasionally in the Alpine kinds, part to remain for a production of late fruit; but, except in these particulars, clear the whole away, as also all weeds and rubbish from the beds or borders; and then, if the plants are in beds, with alleys between, dig each alley longways, burying all remaining weeds and rubbish in the bottom, and spread a little of the earth between the bunches of plants; or, if convenient, where the plants stand separate, may previously dig between them, or give a good deep hoeing to loosen the earth, so then digging the alleys as above; or to plants in borders, having no intervening alleys, may loosen the ground between them, as just observed; and in the whole this will prove a very beneficial dressing, as well as give an air of neatness; and the plants will soon after shoot up into fresh leaves in a close stocky growth before winter; and no further care is necessary till the return of spring; when, and in summer

mer and autumn, the same work must be repeated; and so proceed annually.

Observe however, that if the work of stringing the strawberry-beds as above, in summer and autumn, should be omitted at these seasons, do not fail to do it effectually in spring, in February or March, as above directed in the autumn dressing, digging the alleys, and earthing between the plants in the same manner.

Or in close-running plants, as above, in which the runners have been permitted to overspread the whole surface of the beds or borders, in two, three, or more years' growth, may now, in autumn, dig a spade width between all the rows of main plants, turning down all the intervening runners, and other superfluous plants in these spaces; and this will give room for the main stools, which, together with the digging and loosening the earth effectually about the roots, will greatly strengthen their growth for fruiting in superior perfection next summer.

Forcing them in Hot-houses, &c. for early crops.

Strawberries may be brought to early perfection by aid of a hot-house, forcing-frame, glass-cases against hot-walls, or in common dung hot-beds under frames and glasses, by which ripe fruit may be obtained in February, March, or April; the scarlet and Alpine kinds are the most eligible for this purpose.

For this purpose of forcing, you should be furnished with one or two-year old full-bearing plants, either taken from some principal beds or borders in the full ground, furnished with good plants of that growth, for immediate forcing in the proper season, or young plants of off-sets or runners before described, planted into pots or nursery-beds in summer or towards autumn, and suffered to take their growth in the open air till the following winter twelve-month: they will then be of proper bearing growth for forcing; therefore, in autumn, either pot some proper bearing plants immediately from beds, removing them, and replanting each with a small ball of earth about the roots; or, at the times directed for the natural crops, plant out a quantity of stout young plants either into nursery-beds a foot asunder, or into pots, thirty-twos, and place them in the shade, and watered till well rooted, which in November plunge to their rims in a warm border under a wall or hedge, to remain until April; then replunge them in a shady border for the summer, supplying them plentifully with water; do not omit this, and pull off all runners and flowers. In September transplant them with the balls of earth into larger pots,

twenty-fours, to remain to fruit; and some of those in beds in the open ground may also be now transplanted with balls into the same sized pots to remain for fruiting, giving still plenty of water during the dry warm weather; and towards the latter end of October remove them to a warm situation, or into a common frame, where they may be occasionally sheltered from the inclemency of hard weather till December, January, or February, to prepare them the better for forcing at these times.

Having the plants ready as above, then, towards the end of December, or in January, or February, according to the time the fruit is required, place some pots of plants into the stove or forcing-frame, and either plunge them in the front of the bark-bed, if you would have them as forward as possible, otherwise place them upon the shelves, &c. observing always to place them as near the front glasses as possible; for they rarely succeed so well in the back parts, unless placed upon high shelves near the top lights.

Their culture here is only regular watering twice or thrice a week, just to preserve the earth moderately moist; and you may expect fruit in February and March, or April, by beginning to force sooner or later accordingly.

If you have the convenience of forcing houses or hot-walls, covered with glass frames, for forcing fruit-trees, &c. some strawberry plants may in October be turned entirely out of the pots into the border between the trees, a foot asunder, where they will be firmly rooted by the time for beginning to force the trees; or at the time of forcing, may introduce some in the same manner, or in pots, and the same fires or bark-bed heat will do for the whole.

But where there is not the convenience of hot-houses, &c. the plants may be forced upon dung or tan hot-beds under common hot-bed frames, or in bark-pits, &c.

The hot-beds may be made in January or February, the width and length of the intended frames, and about three feet perpendicular in thickness, placing the frames, &c. on, and when the first flash of great heat is over, put in the plants, previously, if dung hot-beds, laying in some earth or old tan, in which to plunge the pots; but if tan or bark hot-beds, no earth is required, the pots plunged immediately into the bark; and in either of which placing them as close together as they can stand, filling up closely between all the pots; and as soon as done, put on the lights; every day admit fresh air by opening the upper ends of the glasses an inch or two, being careful to examine the heat; if too powerful, draw up the pots proportionably,

portionably, to prevent scorching their roots; and when the heat is much decreased, line the bed, if of dung, as directed for cucumbers, &c. when the plants come into blossom, they may be moved in their pots to fresh hot-beds, to bring them forwarder; or where this is not convenient, they may be retained in the same bed, by supporting a proper heat, by lining both sides occasionally with substantial linings of hot dung, covering the glasses on nights with mats; still admitting fresh air daily at all opportunities, and give due supplies of water; and thus you may have plenty of strawberries towards the end of March and in April.

FRAMES, hot-bed Frames, and other movable Frames furnished with glass covers or lights at top, used in gardens for protecting and forwarding tender and early plants.

These Frames are formed of inch or inch and quarter deal-board, made about three yards and half long, and one and a half wide, as high again in the back as in front, to give the top a due slope to the sun, and proper declivity to carry off the wet, when covered with glass lights to move on and off occasionally.

But with respect to particular dimensions, they are different according to the sorts of plants they are intended to protect; but generally from ten to twelve feet long, four and half wide, and from eighteen inches to three feet six high in the back, and from nine to eighteen inches in front, the ends made sloping answerably from the back to the forepart; each Frame is furnished with three glass sashes at top, commonly called lights, to move on and off, and slide up and down occasionally; but besides these three-light Frames, one or more two-light, and a one-light Frame of proportionable size, may also be necessary for smaller purposes, such as for seed and young seedling plants, to nurse them till large enough for the larger Frames; but as the most common Frames for general use are those used in kitchen gardens, in the culture of cucumbers and melons, which also serve occasionally for various other plants, both esculents and flowers, we shall first exhibit the particular dimensions of such kind of Frames, then describe the others for particular uses.

The common kitchen-garden Frames may be of three different sizes, i. e. for one light, two lights, and three lights; the latter of which however are the most material, and which are employed for general use: but it is necessary also to have one or more one-light and two-light Frames, especially in private gardens, the former as a seed Frame, for a small hot-bed, particularly for the seeds of cucumbers and melons for the early crops, and other ten-

der plants; and the two-light one as a nursery Frame to the young plants of the same kinds, &c. to forward them to a due size for the three-light Frame.

The one-light Frame therefore may be about four feet and a half width from back to front, and three feet six the other way, fifteen or eighteen inches high in the back, and nine to twelve inches high in front, with a glass sash or light, made to fit the top completely, to slide up and down, and move away occasionally.

The two-light Frame may be seven feet long, four and half wide, and fifteen or eighteen inches high in the back, and nine to twelve in front, having one cross bar, three inches width, ranging from the middle of the back at top, to that of the front, serving both to strengthen the Frame, and help to support the lights; the two lights to be each three feet six wide, made to fit the top of the Frame exactly.

The three-light Frames should be ten feet six inches long, four and a half wide, and from eighteen inches to two feet high in the back, and from nine to twelve or fifteen inches in front; observing that those designed principally for the culture of melons may be rather deeper than for cucumbers, because they generally require a greater depth of mould or earth on the beds, though Frames eighteen or twenty inches in the back, and from nine to twelve in front, are often made to serve occasionally, both for cucumbers and melons; each Frame to have two cross bars ranging from the top of the back to that of the front, at three feet six inches distance, to strengthen the Frame, and support the lights; and the three lights to be each three feet six inches wide; the whole together being made to fit the top of the Frame exactly every way in length and width.

Sometimes the above sort of Frames are made of larger dimensions than before specified; but in respect to this, it should be observed, that if larger, they are very inconvenient to move to different parts where they may be occasionally wanted, and require more heat to warm the internal air; and in respect to depth particularly, that if they are but just deep enough to contain a due depth of mould and for the plants to have moderate room to grow, they will be better than if deeper, as the plants will be then always near the glasses, which is an essential consideration in early work; and the internal air will be more effectually supported in a due temperature of warmth; for, the deeper the Frame, the heat of the internal air will be less in proportion; and the plants being farther from the glasses, will

be some disadvantage in their early growth; for which reason the London kitchen gardeners have many of their Frames not more than fourteen or fifteen inches high behind, and eight or nine in front, especially those which are intended to winter the more tender young plants, such as cauliflower, lettuce, and for raising early small salad-herbs, radishes, &c.

But Frames designed for the protection of taller plants should be deeper in proportion, as for example, if designed as a nursery Frame for young pine-apple plants, three feet six by fifteen or eighteen inches, will be the proper depth; arranging the largest plants behind, the young yearling ones more forward, and the crowns and suckers of the year in the front of all; a Frame of this dimension may serve also for any of the hardier kinds of low green-house plants, as myrtles, &c. either in default of a proper green-house, or as an easement to one when too much crowded; likewise a similar Frame is useful as an occasional winter shelter to many sorts of curious young plants of evergreens, and others of the full ground, which being tenderish in their younger growth, require protection from frost for two, three, or more years, till they increase in strength, and are hardened to the full air by degrees.

A drawing Frame for annuals, i. e. for drawing the larger sorts to a tall stature, such as the *Celosia cristata*, or cock's-comb, and the *Amaranthus tricolor*, &c. The Frame for this purpose is sometimes made as deep as it is intended to draw the plants in height, and is sometimes composed of three or more different Frames of equal width and length, to place upon one another occasionally, as the plants advance in stature; the former is sometimes made four, five, or six feet high in the back, and three, four, or five, in front; but the front should be glazed to admit the light and heat of the sun; otherwise the Frame would form a kind of deep pit, which would draw the plants up too fast into small weak stems, and they would also be apt to lose all their lower leaves: that part should also be made to open occasionally, for giving water, or a larger portion of air in hot weather;—but as the general description of this kind of Frame is already given under the articles ANNUAL PLANTS and DRAWING FRAME, the further particulars thereof may be seen under those heads.

In all the sorts of Frames of every dimension here specified, the wood work of the back, ends, and front, should be of inch or inch and quarter deal, as before observed, which should be all neatly planed even and smooth on both sides; and the joints, in framing them toge-

ther, should be so close that no wet nor air can enter; the cross-bars or bearers at top, for the support of the glasses, should be about three inches broad and one thick, and neatly dove-tailed in at back and front even with both edges, that the lights may shut down close, each having a groove or channel along the middle to conduct off all wet falling between the lights: at the end of each Frame at top, should be a thin slip of board four inches broad, arranged from back to front, joining close up to the outside of the lights, which being necessary to guard against cutting winds, rushing in at that part immediately upon the plants, when the lights are occasionally tilted behind for the necessary admission of fresh air, &c.

With respect to the lights, the wood-work of the Frame of each should be inch and half thick, and two and half broad; and the bars for the immediate support of the glass-work should be about an inch broad, and not more than inch and half thick; for if too broad and thick, they would intercept the rays of the sun, so should be only just sufficient to support the glass-work without bending, and should be ranged from the back part to the front, eight or nine inches asunder.

All the wood-work, both of the Frames and lights, should be painted in oil, to preserve them from decay; a lead colour will be the most eligible, and if done three times over, outside and in, will preserve the wood exceedingly from the injuries of weather, and from the moisture of the earth and dung.

The glass work of the lights may either be laid in lead and well trimmed with cement, air and water tight; or may be laid in the bars of wood in putty, *imbricatum*, i. e. overlaid, or lapping at the ends; the latter method is by some preferred, as being more effectual for the discharge of wet, and the imbricatures or lapping of the panes being left open or unputtied at bottom, that the rancid vapour naturally arising in hot-beds, and all condensed drops against the glasses, may be discharged at these places, as well as admit a perpetual moderate current of fresh air, proves very beneficial to all plants: this mode, however, of leaving the lappings open, is by some objected against, especially for very early work, on account of the too free admission of air in cold weather; I however have used them with great success at all seasons; though, in the kitchen-gardens about London, where there are vast quantities of framing always at work, their lights are, for the general part, laid in lead, in panes about six or eight inches square: in either method of glazing the best sort of white

white glass should be used, and the greatest care exerted to make the whole perfectly water-tight.

FRAMING, a term in practical gardening, implying the general business of raising various tender and other plants to early perfection in Frames, by means of hot-beds.

FRAXINUS, the Ash-tree.

There are four principal species, and several varieties, all hardy deciduous trees, one of them a lofty forest tree, the others of lower growth, and used principally in ornamental plantations, all of them adorned with compound leaves of several pair of lobes or folioles, terminated by an odd one.

Class and order, *Polygamia Diœcia*.

Characters.] CALYX, hermaphrodite and female flowers on different trees, having sometimes small monophyllous cups, and sometimes none. COROLLA, either none, as in the common ash; or, as in some species, four narrow petals. STAMINA, two short filaments, and oblong antheræ. PISTILLUM, an oval germen, erect style, and bifid stigma. PERICARPIUM, a compressed fruit, having a single, spear-shaped, compressed seed.

The fruit of the ash are commonly called ash-keys.

The species are,

1. *FRAXINUS excelsior*.

More lofty or common ash-tree.] Fraxinus with a large upright grey stem, rising sixty or seventy feet high, branching upward into a full regular head, garnished with large compound leaves of five pair of sawed lobes, terminated by an odd one, and small greenish flowers without petals.

Varieties.] With silver-striped leaves—gold-striped leaves—various-leaved—entire-leaved—with pendulous branches, called pendulous ash.

2. *FRAXINUS Americana*.

American Ash. Varieties of this are;

Black American Ash.—Having an erect stem, branching twenty or thirty feet high, large very dark leaves, composed of three or four pair of lobes, and an odd one; small greenish flowers, and broad blackish fruit.

White American Ash.—Having an upright whitish stem and branches, growing twenty or thirty feet high, light green leaves, composed of about three pair of obtusely sawed lobes, placed far asunder, terminated by an odd one, ending in a very long point, decaying to a whitish colour in autumn.

Red American Ash.—Grows twenty or thirty feet high, having reddish shoots, large light green leaves, of about three pair of distinctly sawed lobes, terminated by an odd one, five

or six inches long, and three broad, decaying to a reddish hue in autumn.

3. *FRAXINUS rotundifolia*.

Round-leaved Calabrian Manna Ash—grows twenty feet high, leaves composed of four or five pair of lobes and an odd one; and small greenish flowers: from the exudation of the leaves is collected the manna of the shops.

4. *FRAXINUS Ornus*.

(Ornus)—or *flowering Ash*—grows twenty or thirty feet high; leaves composed of three or four pair of sawed lobes far asunder, terminated by an odd one; and large loose bunches of white flowers at the end of all the branches, furnished with petals.

Variety.] *Dwarf flowering Ash*—grows twelve or fifteen feet high; smallish dark green leaves of three or four pair of sawed lobes, and an odd one, and small bunches of flowers furnished with petals.

All these species and varieties of *Fraxinus* are very hardy deciduous trees: the first sort grows common in hedges and woods all over England, but all the others are principally of American growth; all the sorts flower in April and May; of which none but the *Fraxinus ornus* make any appearance, the others being small, apetalous, and greenish; the flowering ash, however, is very ornamental in blossom, the bunches being large, and terminate almost every branch, appearing extremely conspicuous; none however but the common ash produce seed in this country, which ripen in great abundance in autumn; but those of all the others are often procured from America by the seedsmen; which, as well as the common sort, grow freely here in any common earth.

The common Ash is generally considered as a forest or timber-tree, and as such is very valuable, the timber being excellent for many useful purposes, particularly for almost all sorts of husbandry implements, ploughs, harrows, waggons, carts, axle-trees, wheel-fellies, &c. and the poles of the under-wood are proper for hoops, hop-poles, and many other uses; and as the trees grow freely upon almost any soil, and of quick growth, they may be cultivated to great advantage, some to cut every seven, ten, or fifteen years for poles, others left to grow for timber; the loppings are excellent fuel, and burn well, green or dry, so that old pollards, for the purpose of lopping at proper intervals of time, will be very profitable.

But the other three species and varieties are esteemed principally to assist in forming variety in ornamental plantations; but the flowering kinds having the greatest merit for ornament, should be introduced in the most conspicuous parts of view.

Propagation of all the Sorts.

All the sorts may be raised plentifully from seed, which the common Ash furnish in abundance; but the other sorts rarely furnishing any seed in this country, it is procured from abroad, or when their seeds cannot be obtained, they are propagated by budding upon stocks of the common ash.

By seed.—The common sort should be sown in autumn, soon after they are ripe, and those of the others as soon as they can be obtained, which commonly arrive early in spring; and the sooner the better; prepare for all the sorts beds of common earth four feet wide, sow the seeds evenly on the surface, and cover them an inch deep; some of the plants will come up the spring following, and many not till the second spring: when they are a year or two old, prick them out into nursery rows, two feet asunder, and one foot in the lines, and here to remain till they are four, five, or six feet high or more, then transplant them where they are to remain.

By Budding and Grafting.—This is often practised in default of seeds, to propagate the second, third, and fourth species and varieties, as also to continue the variegated kinds, working all of them upon stocks of the common ash, at the usual season of budding and grafting.

FRITILLARIA, Fritillary, including also the *Corona Imperialis* and Persian Lily.

This genus furnishes a great variety of bulbous-rooted flowery perennials, proper to adorn the compartments of the pleasure-garden, producing annual stalks from about one foot to a yard or more high, terminated by large, bell-shaped, liliaceous flowers.

Class and order, *Hexandria Monogynia*.

Characters.] CALYX, none. COROLLA is large, composed of six oblong petals, bell-shaped, and spreading above. STAMINA, six filaments, and erect four-cornered antheræ. PISTILLUM, an oblong, three-cornered, germen, simple style, and triple stigma. PERICARPium, an oblong, trilobate, trilocular capsule, and numerous flat seeds.

The species are,

1. FRITILLARIA *Meleagris*.

(*Meleagris*) — or *Common alternate-leaved Fritillary*.] Fritillary with a depressed, fleshy, bulbous root, an erect flower-stalk a foot or fifteen inches high, garnished with long narrow leaves placed alternate, and the top terminated by one or more large bell-shaped flowers hanging downwards, of different properties in the varieties.—Some finely chequered in regular squares, others of plain colours, as described below.

2. FRITILLARIA *pyrenaica*.

Pyrean, opposite-leaved Fritillary.] Fritillary with a double, fleshy, bulbous root, an upright flower-stalk twelve or fifteen inches high, garnished with long narrow leaves by pairs opposite, and the top terminated by two or more large bell-shaped flowers hanging downward, of different colours and properties in the varieties.

Varieties of the above two species are—common chequered Fritillary, of which there are several varieties, having the flowers curiously chequered with purple, white, and other colours—dark-purple, yellow-spotted Fritillary—yellow-flowering—great yellow-flowering—variegated yellow-flowered—white-flowered—black-flowered—with red flowers—red spotted flowers—large double-flowering—spotted-flowered, different varieties—umbelliferous flowering—spiked-flowering—with narrow leaves—broad leaves. All these varieties have great merit in the diversity of their large bell-shaped pendulous flowers; and those of the chequered kinds have particular singularity, being finely chequered in regular squares in a very curious manner:—flowering principally in the latter end of March, in April, and some part of May, some late sorts also in June; all of them are succeeded by plenty of seed in autumn.

3. FRITILLARIA *persica*.

Persian Fritillary, commonly called *Persian Lily*.]—Varieties of this are,

Tall Persian Lily.—Hath a round, whitish, bulbous root, an upright firm stalk a yard high, closely garnished with long, narrow, obliquely-waved leaves, and the top terminated by a large pyramidal spike of deep-purple flowers spreading wide at their brims.

Dwarf Persian Lily.—Produces an erect stalk a foot and half high, small leaves, and somewhat branching spike of deep purple flowers.

4. FRITILLARIA *imperialis*.

Imperial Fritillaria, commonly called *Crown Imperial* (*Corona imperialis*.) Fritillary with a very large, round, scaly, bulbous, yellow root, an upright, thick, succulent stalk, two to three or four feet high, garnished with long narrow leaves; and crowned by a vast surrounding cluster of large, bell-shaped, pendulous flowers, these surmounted by a large tuft of leaves; flowering in different colours and properties in the varieties.

The root of this species and varieties is composed of numerous, thick, succulent scales, and is remarkable for imparting a very disagreeable rank odour.

Varieties of this are,] Crown imperial with dusky-

dusky-red flowers—with bright-red flowers—late red-flowering—double red flowers—golden-yellow flowers—pale-yellow flowers—yellow striped flowers—double yellow flowers—doubly-crowned, or crown upon crown, having two tier of flowers one above another—triply-crowned, having three tier of flowers—with gold-striped leaves—and with silver-striped leaves. All these varieties are fine majestic plants, of three or four feet stature, making a singularly fine appearance with their large noble crown of flowers, &c. and greatly ornament our gardens so early as April and May; all of them so hardy, of easy culture, and increase so plentifully by off-sets from the roots, that they might be obtained in abundance in every garden.

The flowers of all the four species of *Fritillaria*, and their varieties, have universally a campanulate, hexapetalous corolla, of the liliaceous kind, all remarkable for their pendulous or hanging position; those of the crown imperial considerably the largest; but all of them form a fine variety in the flower-garden.

All the species and respective varieties are very hardy bulbous-rooted perennials, the roots of great duration, but the flower-stalks are renewed annually in spring; which in the different sorts flower in March, April, May, and June, when, and in July, they ripen seeds, and the stalks then assume a state of decay, the bulbs become inactive for that season, and ripe for removal, if necessary, either for the purpose of increase by off-sets, or for transplantation into fresh digged earth, and some into other different compartments occasionally; and which operations may be proper every second or third year, for in that time they will have increased exceedingly by off-sets into large bunches, and should be divided, and being planted again in fresh-dug soil, will greatly improve their future bloom.

The different species, and all their varieties, are hardy to grow in any common garden earth, in beds and borders in any open situation, constantly to remain, except occasional transplanting as above.

They all form a fine variety, and are pretty ornaments for the principal flower-borders, beds, and other compartments of the flower-garden and pleasure-ground: the two common Fritillary kinds and their varieties show to good advantage when disposed in three or four roots together, in small patches towards the front of the borders, that is, if they are placed in assemblage with other flowers; but the Persian Fritillary or Lily should be stationed rather more backward in the border, and the

crown imperials should occupy the middle range behind both these, as being of larger growth, and should always be placed singly, and two or three yards distance:—disposing the whole in some varied order, to show a greater diversity; or may occasionally plant some of the different species in beds by themselves; set the Fritillary and Persian lily-kinds in rows nine inches or a foot asunder, and the same distance in each row, and three inches deep; and the crown imperials a foot distance each way, and four or five inches in depth.

The season for planting or transplanting all these bulbs is when the flower-stalks are decayed in June, or July, or beginning of August, though the bulbs taken up at that time, may be kept out of the ground two or three months, if necessary, by being laid in dry sand, or kept close and dry; but the Fritillary and Persian-lily are rather more impatient out of the earth than the crown imperial, and therefore should always be put in again as soon as convenient in autumn.

The planting may be performed in the borders, the large bulbs inserted by making apertures with a garden trowel, the smaller bulbs planted either by that method or with a thick blunt dibble; and in beds may either be planted by the same method, or by drills drawn a proper depth, or bedded in by trimming off a proper depth of earth from the beds into the alleys; place the roots in the bed at the allotted distances, thrusting the bottom of each into the earth, then cover the whole with the earth from the alleys, the depth abovementioned, and rake the surface even.

Observe, it is always proper to remove all these bulbs every second or third year, to separate the off-sets, and replant the whole in fresh-dug ground. See their *Propagation*.

Propagation of all the Sorts.

The general mode of propagation of all these plants is by off-sets, which they all furnish abundantly from the sides of their roots, and which may be separated every second or third year; the proper time is when their flower-stalks decay as aforesaid, taking the whole up entirely out of the earth, and separate them into distinct roots, planting the smaller off-sets by themselves in nursery beds, to remain a year or two, to acquire a flowering state; and the larger roots, plant where they are designed to remain for flowering.

They are also propagated by seed; but this is principally practised to gain new varieties, and the process is tedious; the Fritillary and Persian-lily will be three years, and the crown imperial

imperial sometimes six or seven, before they flower in perfection.

The seeds may be sown in August or September, in largish wide pots, or in boxes of similar width; either of which being filled with light mellow earth, sow the seed, each sort separate, cover them evenly with fine earth half an inch deep, placing the pots, &c. to have only the morning sun all summer, or during hot, dry weather, and in the full sun in winter and spring: the plants will come up in April and May, which, after the first or second year's growth, when the leaves decay in summer, may be all taken up, and the whole planted immediately in nursery-beds, in shallow drills four inches asunder, to remain till they flower; which, in some, will be in the third or fourth year; others, as the crown imperial, will sometimes be five or six years before they flower in tolerable strength; then all the sorts may be transplanted into the flower-borders, beds, &c.

FRUIT-TREES, comprehending such as produce eatable fruit, either for the dessert or culinary uses.

There are about twelve genera of Fruit-trees and fruit-bearing shrubs and shrubby plants that ripen their fruit perfectly in this country, each genus comprising several species, and each species numerous varieties, all of which are exhibited in their respective genera; so in this place we shall only give a list of the different genera, and the number of species in each, to show at one view the generic names under which they occur in this work, according to botanic arrangement.

AMYGDALUS, *Almond-tree*—three species, the almond, peach, and nectarine; of each of which are many varieties, especially of the peach and nectarine. See AMYGDALUS.

CORYLUS, *the Hazel, or Hazel-nut tree*—one species comprising the common hazel-nut of the woods — filbert-tree — Barcelona or Spanish nut—cob-nut, &c. See CORYLUS.

FAGUS, *Beech-tree*—comprising the *Fagus Castanea* or chestnut-tree.

FICUS, *the Fig-tree*—one species comprehending numerous varieties. See FICUS.

JUGLANS, *Walnut-tree*—one species of the common walnut, comprising several varieties. See JUGLANS.

MESPILUS, *Medlar* — comprising three principal sorts. See MESPILUS.

MORUS, *Mulberry-tree*—includes three principal sorts. See MORUS.

PRUNUS, *Plum-tree*—includes three principal species — the plum-tree — apricot — and cherry-tree, each comprising many varieties;

comprehends also the bullace-tree, and the sloe. See PRUNUS.

PYRUS, *Pear-tree*—comprises three species — the pear—apple—and quince, each having many varieties; particularly the pear and apple, whose varieties are without end. See PYRUS.

RIBES, *Current-tree*; and *Ribes Grossularia*, the gooseberry-bush; each comprising many varieties of the fruit. See RIBES.

RUBUS IDÆUS, *Raspberry*—one species comprising three or four principal varieties. See RUBUS.

VITIS, *the Vine*—one species comprising numerous varieties of the fruit. See VITIS.

Each of the above genera of fruit-trees, &c. is exhibited in its proper place, and under each are arranged its principal species, with that of the varieties of the fruit of each respective species, with their proper names and description, and the propagation, and general culture of the respective trees.

FRUTEX, a shrub, or sort of small-tree of inferior growth.

A shrub, like a tree, rises with a woody, durable stem, but which generally either divides low into many branches, or sometimes rising with several stems from or near the bottom, and these also dividing low into branches, forming a bushy head, growing to a height superior to under-shrubs, and inferior to that of common trees, and different too from what are commonly considered as trees, in that the latter always rise with a single stem or trunk, to a considerable altitude, and the shrubs terminate the stem at a small height, by dividing low, as aforesaid, into branches, assuming a bushy growth, four or five to eight or ten feet high, or but little more.

Though there are no particular stated limits of growth to distinguish a shrub from a tree, as, according to the above definition of a shrubby growth, they rise to different heights in that way in the head, from four or five to ten or fifteen feet, so that the principal distinction which can be given to such as come under the denomination of shrubs, is, the stem never attains any considerable upright stature, but divides at an inferior height as before observed, some near the ground, others at one or two, to three, four or five feet, and some rise with several dividing stems of branchy low growth as above.

Of the shrubby kind, there are shrubs and under-shrubs; the former are considered as of superior height, of four or five, to eight or ten feet or more, as in lilac, privet, althæa frutex, laurustinus, phillyrea, alaternus, &c. and under-shrubs are of six inches, to two, or three feet, in different sorts, as thyme, hyssop, sage,

sage, southernwood, lavender, dwarf-box, lavender-cotton, rue, &c.

Shrubs and under-shrubs are a very numerous tribe, consisting both of deciduous and ever-green kinds, and the greater part cultivated in our gardens principally for ornament and variety: very few are of the economical kind, as principally the currant and gooseberry shrubs for their production of fruit: but of the others many are very ornamental flowering shrubs, and some are beautiful ever-greens, and others of peculiar singularity for variety; and in the whole they have particular merit in forming and adorning our shrubbery plantations.

FUCHSIA, a genus of stove exotics of peculiar beauty.

Class and order, *Octandria Monogynia*.

Characters.] CALYX, monopetalous, funnel-shaped, coloured and deciduous, the tube oval at the base, with the border deeply cut into four oval, pointed spreading segments. COROLLA, four ovate small petals. STAMINA, eight slender, erect filaments, much longer than the cup, and topped with ovate antheræ. PISTILLUM, an oval germen, and a slender erect style, crowned with an oblong stigma. PERICARPIUM, an oblong-oval berry, with four cells, containing many small oval seeds affixed to a columnar receptacle.

The following species is worthy our notice.

FUCHSIA *coccinea*.

Scarlet Fuchsia.] Fuchsia with oval, denticulated leaves, placed opposite in pairs, and obovate, obtuse petals.

This beautiful plant rises from a fibrous root with several stems, garnished with oval, pointed leaves, about two inches long and one broad; the flowers, which are pendulous, and grow three or four together, have a most beautiful scarlet cup, involving four purple petals with long scarlet stamina; they are produced the greatest part of the summer, and the plant deserves a place in every stove. Though this plant will not succeed well in winter out of a stove, yet it may be kept in a greenhouse, is readily propagated both by layers, cuttings, or seeds, and frequently by suckers.

FUMARIA, Fumatory.

It furnishes some low, tuberous-bulbous-rooted, flowery perennials, for the flower-garden; producing annual stalks six or eight inches high, terminated by short spikes of ringent flowers.

Class and order, *Diadelphia Hexandria*.

Characters.] CALYX, two small deciduous leaves. COROLLA is tubular and ringent, having the lips plane, obtuse, emarginated and reflexed, having a nectarium at their base,

and the chops of the corolla four-cornered. STAMINA, six equal, broad filaments, each having three antheræ. PISTILLUM, an oblong germen, short style, and an orbicular compressed stigma. PERICARPIUM, a short unilocular pod, and roundish seeds.

The principal species are,

1. FUMARIA *cava*.

Hollow-rooted Fumatory.] Having a large fleshy root, hollow in the middle, crowned by branching leaves, dividing into many small parts, and upright stalks six inches high, adorned with leaves, and terminated by spikes of reddish-purple flowers, in April.

Varieties.] Red-flowered—purple-flowered—white-flowered.

2. FUMARIA *solida*.

Solid-rooted Fumatory.] Having a large, round, solid, yellow root; leaves like the former, and stalks four or five inches high, adorned with leaves, and terminated by spikes of purple flowers, in April.

3. FUMARIA *Cucullaria*.

(*Cucullaria*)—or *Naked-stalked Virginia Fumatory.*] Fumaria with a small, round, icaly root, crowned by leaves divided into three principal parts, each dividing into many smaller; upright leafless stalks, eight or nine inches high, terminated by a loose spike of dull white flowers, forked at their base; flowering in May.

4. FUMARIA *capnoides*.

(*Capnoides*)—or *Diffused-branching Fumatory.*] Fumaria with a fibrous root, sending out many slender tufty stalks, diffusely branching eight or nine inches high; finely-divided ever-green leaves, and all the branches terminated by loose panicles of bright-yellow flowers most part of summer.

Variety.] With a whitish flower.

5. FUMARIA *glauca*.

Glaucous Upright American Fumatory.] Fumaria with an upright stalk branching a foot and half high, garnished with branchy finely-divided glaucous leaves, and all the branches terminated by loose spikes of pale-purple flowers most part of summer, succeeded by narrow paniculated pods.

The flowers of all these plants are of the ringent or gaping kind, are small, but form a pretty variety.

All these plants may be employed to adorn the borders of the pleasure-gardens, placing them in small patches towards the fronts of the borders, where they will appear very ornamental.

The fourth and fifth species are also proper to dispose on the sides of rock-work, grottos, artificial ruins, &c.

Theis

dark-red flowers—with bright-red flowers—late red-flowering—double red flowers—golden-yellow flowers—pale-yellow flowers—yellow striped flowers—double yellow flowers—doubly-crowned, or crown upon crown, having two tier of flowers one above another—triply-crowned, having three tier of flowers—with gold-striped leaves—and with silver-striped leaves. All these varieties are fine majestic plants, of three or four feet stature, making a singularly fine appearance with their large noble crown of flowers, &c. and greatly ornament our gardens so early as April and May; all of them so hardy, of easy culture, and increase so plentifully by off-sets from the roots, that they might be obtained in abundance in every garden.

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imperial sometimes six or seven, before they flower in perfection.

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FRUIT-TREES, comprehending such as produce eatable fruit, either for the dessert or culinary uses.

There are about twelve genera of Fruit-trees and fruit-bearing shrubs and shrubby plants that ripen their fruit perfectly in this country, each genus comprising several species, and each species numerous varieties, all of which are exhibited in their respective genera; so in this place we shall only give a list of the different genera, and the number of species in each, to show at one view the generic names under which they occur in this work, according to botanic arrangement.

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MESPILUS, *Medlar*—comprising three principal sorts. See MESPILUS.

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comprehends also the bullace-tree, and the sloe. See PRUNUS.

PYRUS, *Pear-tree*—comprises three species—the pear—apple—and quince, each having many varieties; particularly the pear and apple, whose varieties are without end. See PYRUS.

RIBES, *Currant-tree*; and *Ribes Grossularia*, the gooseberry-bush; each comprising many varieties of the fruit. See RIBES.

RUBUS IDÆUS, *Raspberry*—one species comprising three or four principal varieties. See RUBUS.

VITIS, *the Vine*—one species comprising numerous varieties of the fruit. See VITIS.

Each of the above genera of fruit-trees, &c. is exhibited in its proper place, and under each are arranged its principal species, with that of the varieties of the fruit of each respective species, with their proper names and description, and the propagation, and general culture of the respective trees.

FRUTEX, a shrub, or sort of small-tree of inferior growth.

A shrub, like a tree, rises with a woody, durable stem, but which generally either divides low into many branches, or sometimes rising with several stems from or near the bottom, and these also dividing low into branches, forming a bushy head, growing to a height superior to under-shrubs, and inferior to that of common trees, and different too from what are commonly considered as trees, in that the latter always rise with a single stem or trunk, to a considerable altitude, and the shrubs terminate the stem at a small height, by dividing low, as aforesaid, into branches, assuming a bushy growth, four or five to eight or ten feet high, or but little more.

Though there are no particular stated limits of growth to distinguish a shrub from a tree, as, according to the above definition of a shrubby growth, they rise to different heights in that way in the head, from four or five to ten or fifteen feet, so that the principal distinction which can be given to such as come under the denomination of shrubs, is, the stem never attains any considerable upright stature, but divides at an inferior height as before observed, some near the ground, others at one or two, to three, four or five feet, and some rise with several dividing stems of branchy low growth as above.

Of the shrubby kind, there are shrubs and under-shrubs; the former are considered as of superior height, of four or five, to eight or ten feet or more, as in lilac, privet, althæa frutex, laurustinus, phillyrea, alaternus, &c. and under-shrubs are of six inches, to two, or three feet, in different sorts, as thyme, hyssop, sage,

sage, southernwood, lavender, dwarf-box, lavender-cotton, rue, &c.

Shrubs and under-shrubs are a very numerous tribe, consisting both of deciduous and ever-green kinds, and the greater part cultivated in our gardens principally for ornament and variety: very few are of the economical kind, as principally the currant and gooseberry shrubs for their production of fruit: but of the others many are very ornamental flowering shrubs, and some are beautiful ever-greens, and others of peculiar singularity for variety; and in the whole they have particular merit in forming and adorning our shrubbery plantations.

FUCHSIA, a genus of stove exotics of peculiar beauty.

Class and order, *Ostendria Monogynia*.

Characters.] CALYX, monopetalous, funnel-shaped, coloured and deciduous, the tube oval at the base, with the border deeply cut into four oval, pointed spreading segments. COROLLA, four ovate small petals. STAMINA, eight slender, erect filaments, much longer than the cup, and topped with ovate antheræ. PISTILLUM, an oval germen, and a slender erect style, crowned with an oblong stigma. PERICARPIUM, an oblong-oval berry, with four cells, containing many small oval seeds affixed to a columnar receptacle.

The following species is worthy our notice.

FUCHSIA *coccinea*.

Scarlet Fuchsia.] Fuschia with oval, denticulated leaves, placed opposite in pairs, and obovate, obtuse petals.

This beautiful plant rises from a fibrous root with several stems, garnished with oval, pointed leaves, about two inches long and one broad; the flowers, which are pendulous, and grow three or four together, have a most beautiful scarlet cup, involving four purple petals with long scarlet stamina; they are produced the greatest part of the summer, and the plant deserves a place in every stove. Though this plant will not succeed well in winter out of a stove, yet it may be kept in a greenhouse, is readily propagated both by layers, cuttings, or seeds, and frequently by suckers.

FUMARIA, Fumatory.

It furnishes some low, tuberous-bulbous-rooted, flowery perennials, for the flower-garden; producing annual stalks six or eight inches high, terminated by short spikes of ringent flowers.

Class and order, *Diadelphia Hexandria*.

Characters.] CALYX, two small deciduous leaves. COROLLA is tubular and ringent, having the lips plane, obtuse, emarginated and reflexed, having a nectarium at their base,

and the chops of the corolla four-cornered. STAMINA, six equal, broad filaments, each having three antheræ. PISTILLUM, an oblong germen, short style, and an orbicular compressed stigma. PERICARPIUM, a short unilocular pod, and roundish seeds.

The principal species are,

1. FUMARIA *cava*.

Hollow-rooted Fumatory.] Having a large fleshy root, hollow in the middle, crowned by branching leaves, dividing into many small parts, and upright stalks six inches high, adorned with leaves, and terminated by spikes of reddish-purple flowers, in April.

Varieties.] Red-flowered—purple-flowered—white-flowered.

2. FUMARIA *solida*.

Solid-rooted Fumatory.] Having a large, round, solid, yellow root; leaves like the former, and stalks four or five inches high, adorned with leaves, and terminated by spikes of purple flowers, in April.

3. FUMARIA *Cucullaria*.

(Cucullaria)—or *Naked-stalked Virginia Fumatory.*] Fumaria with a small, round, scaly root, crowned by leaves divided into three principal parts, each dividing into many smaller; upright leafless stalks, eight or nine inches high, terminated by a loose spike of dull white flowers, forked at their base; flowering in May.

4. FUMARIA *capnoides*.

(Capnoides)—or *Diffused-branching Fumatory.*] Fumaria with a fibrous root, sending out many slender tufty stalks, diffusely branching eight or nine inches high; finely-divided ever-green leaves, and all the branches terminated by loose panicles of bright-yellow flowers most part of summer.

Variety.] With a whitish flower.

5. FUMARIA *glauc*.

Glaucous Upright American Fumatory.] Fumaria with an upright stalk branching a foot and half high, garnished with branchy finely-divided glaucous leaves, and all the branches terminated by loose spikes of pale-purple flowers most part of summer, succeeded by narrow paniculated pods.

The flowers of all these plants are of the ringent or gaping kind, are small, but form a pretty variety.

All these plants may be employed to adorn the borders of the pleasure-gardens, placing them in small patches towards the fronts of the borders, where they will appear very ornamental.

The fourth and fifth species are also proper to dispose on the sides of rock-work, grottos, artificial ruins, &c.

The

F U M

Their Propagation.

The first three species and varieties are propagated by off-sets from their roots, in the manner as other bulbous-tuberous-rooted plants, when their leaves decay, any time from May till August, which may be performed every two or three years, or according as they multiply.

The fourth and fifth species are easily raised in abundance from seed sown soon after they ripen, or in spring, sowing them where they are to remain, or for transplanting.

F U N

FUNGI. Plants of the Mushroom tribe, of which there are numerous genera and species, which grow wild in fields, meadows, woods, and various uncultivated places, all considered of the tribe of imperfect plants belonging to the botanic class *Cryptogamia*, having concealed generative organs, or in the greater part imperfectly visible; and in the whole of this very numerous tribe, only one species come under our observation for garden culture, which is the *Agaricus campestris*, or Garden Mushroom. See **AGARICUS**.

G.

G A L

GALANTHUS, Snow-drop.

It consists of one low, bulbous-rooted, flowery perennial for the flower-borders, rising but a few inches high, adorned at top with small tripetalous flowers.

Class and order, *Hexandria Monogynia*.

Characters.] **CALYX**, an oblong spathe opening side-ways. **COROLLA**, three oblong, concave, spreading petals, and in the bottom, a three-leaved nectarium. **STAMINA**, six short filaments, and oblong, pointed, connivent antheræ. **PISTILLUM**, an oval germen under the corolla, slender style, and simple stigma. **PERICARPIUM**, a three-cornered, trilocular capsule, and numerous roundish seeds.

There is but one species, viz.

GALANTHUS nivalis.

Snow-drop.] Galanthus with a small, tuberculated, bulbous root, crowned with several long, narrow, bluish-green leaves, and amidst them small angular, naked flower-stalks, four or five inches high, terminated by a spathe, each protruding one small snow-white flower drooping downward.

Varieties.—Common single-flowered snow-drop—semi-double snow-drop—double snow-drop.

These are delightful little plants, considering the early appearance of their snow-white flowers, adorning our gardens often in January and February, when scarce any other flower is to be seen, and frequently bursting forth when the ground is covered with snow, continuing very often till the beginning of March, and make a very ornamental appearance, especially when disposed in clusters towards the fronts of borders, &c.

G A R

The single sort comes first into bloom, then the semi-double, and after that the double.

They should be employed to adorn the fronts of flower-borders, the edges of wilderness plantations, the borders of wood-walks, and the fronts of shrubbery-clumps, &c. for they will succeed any where, and multiply exceedingly by off-sets from the roots.

They effect considerably the best appearance when disposed in bunches of several roots together, placing some near the edge of the borders, other bunches a foot or more back, in which order they will form variety more eligibly than in straight rows; or when disposed singly, or by way of edgings to borders, as sometimes practised, in which they have a straggling appearance.

The roots should therefore be planted five or six together at least in a cluster, placing them two or three inches deep, and permit them to remain undisturbed four or five years to increase into large bunches; they will then form the best appearance.

Their propagation is by off-sets of the roots; the best season for which is June or July, though, they being so hardy, it may be done at almost any time after the bloom; but I would prefer summer for that work, when their leaves decay, and may either be planted directly, or kept out of the ground till October or November; but do not however retain them longer out of the ground than December, otherwise they will flower weak the first year. See **BULBUS**.

GARDENS. Gardens and plantations are grand, ornamental, and economical improvements to a country seat and estates in general, and

and may be divided into the following principal districts:—the pleasure-ground and flower-garden—kitchen-garden—orchard—nursery—and plantations. For a proper description of each, see PLEASURE-GARDEN, KITCHEN-GARDEN, &c.

GARCINIA, Mangostan.

An American tender exotic tree for the stove, garnished with spear-shaped leaves and rosaceous flowers.

Class and order, *Dodecandria Monogynia*.

Characters.] CALYX, a four-leaved cup, spreading and persistent corolla, four roundish concave spreading petals. STAMINA, ten upright filaments placed cylindrical, with roundish antheræ. PISTILLUM, a sub-oval germen, very short style, crowned with a flat, spreading, peltated stigma. PERICARPIUM, a globose, large, leathery berry, crowned with the stigma, containing eight fleshy villose seeds, convex on one side and angular on the other.

The species is,

GARCINIA *Mangostana*.

Garcinia, or Mangostan.] It rises with an upright stem many feet high, furnished with opposite branches which are grey coloured and smooth; these are garnished with spear-shaped leaves, of a shining green on their upper side and olive on their under: the flowers are rosaceous, consisting of four roundish, dark-red petals, and are succeeded by the fruit containing a soft juicy pulp of a rich flavour, in which the seeds are intermixed.

The propagation of this plant is by seeds from where they are natives, which should be sown in pots or boxes of light earth, and then imported here, and transplanted into single pots and plunged into the bark-bed, care being taken to shade them till fresh rooted, when they may be managed as other woody tender stove plants.

GARDENIA, Cape Jasmine.

This genus furnishes one species of particular note, an elegant evergreen flowering shrub, from the Cape of Good Hope, for the stove, singularly beautiful, floriferous, and fragrant, in its large, odorous, white flowers, which are monopetalous, five-parted, spreading.

Class and order, *Pentandria Monogynia*.

Characters.] CALYX is monophyllous, quinquangular, five-parted, and permanent.—COROLLA, a salver-shaped contorted petal, with a cylindric tube and limb deeply divided into five oval segments. STAMINA, no filaments, but five narrow antheræ. PISTILLUM, a germen under the corolla, slender style, and bilobed oval stigma. PERICARPIUM, a two or four-celled berry, and many seeds.

The species is,

GARDENIA *florida*.

Flowery Gardenia, or Cape Jasmine.] Gardenia with a woody stem, branching in pairs several feet high, spear-shaped, entire, shining green leaves, four or five inches long, and half as broad, growing by pairs opposite; and at the sides and ends of the branches large close-fitting spreading flowers, of great fragrance.

The flowers of this shrub, although in their characteristic state reckoned monopetalous, yet they are often semi-double, having two or three series of petals, and often as large as a middling rose.

This plant is a native of the Cape of Good Hope, China, and Japan; but will live here in the full air in summer, and in a greenhouse in winter, but flowers best in the hot-house.

It must always be kept in pots of light rich earth.

It is easily propagated by layers and cuttings. Lay down some young shoots in spring, in the earth of the pots; they will readily strike root: and cuttings of the shoots planted in pots in spring or summer, and plunged in a bark-bed, or any hot-bed under glasses, will be well rooted in two or three months, when they should be planted in separate pots.

GENISTA, Jointed-Broom.

This genus retains low, shrubby, deciduous, and ever-green plants for the pleasure-ground and greenhouse, growing from two to six or seven feet high, adorned with small simple leaves, and papilionaceous yellow flowers.

Class and order, *Diadelphina Decandria*.

Characters.] CALYX is monophyllous, tubulous, and bilabiate. COROLLA is papilionaceous; the vexillum, oval, acute, and wholly reflexed; the wings oblong, short, and loose; and the keel long and erect. STAMINA, ten diadelphous filaments, and simple antheræ. PISTILLUM, an oblong germen, an ascending style, and acute involute stigma. PERICARPIUM, a roundish, bivalvate, unilocular pod, and kidney-shaped seed.

Hardy Kinds.

1. GENISTA *sagittalis*.

Arrow-shaped, Jointed-Broom.] Genista with trailing, two-edged, green, shrubby stalks, dividing into many trailing, flat-jointed branches, garnished with small oval-lanceolate leaves, singly at each joint, and close spikes of yellow flowers at the ends of the branches.

2. GENISTA *tinctoria*.

Dyer's Broom.] Genista with upright, shrubby stalks, branching erectly two or three feet high, having taper, striated branches, garnished with spear-shaped, alternate leaves, and from the sides and ends of the branches numerous small yellow flowers.

Variety.] Dyer's-broom with spreading branches.

The name *Tinctoria*, or dyer's-broom, to this species is derived from its use in dying; it grows naturally in several parts of Britain, &c.

3. GENISTA *anglica*.

Dwarf English Broom, or Petty Whin.] Genista with shrubby stalks branching two or three feet high, armed with long single spines below, and garnished with small, spear-shaped, alternate leaves, and clusters of yellow flowers at the ends of the branches.

This species grows wild on heaths and other barren places in many parts of England, but is often admitted into gardens for variety.

4. GENISTA *tridentata*.

Tridented-leaved Portugal Broom.] Genista with upright shrubby stalks, dividing into many three-cornered branches, rising three or four feet high, garnished with three-pointed leaves, and large yellow flowers, singly from the sides and ends of the branches.

Variety. — Low, narrow-leaved Portugal Broom.

5. GENISTA *candicans*.

Upright Montpellier Genista, or Cytisus of Montpellier.] Genista with an upright shrubby striated stem, branching four or five feet high; garnished with trifoliolate-leaves, hoary underneath, and bright yellow flowers from the sides of the branches.

6. GENISTA *florida*.

Flowery Spanish Dyer's Broom.] With round taper striated branches, silky leaves, and many clusters of flowers.

7. GENISTA *pilosa*.

Hairy tuberculated Trailing Broom.] With procumbent tuberculated stalks, and spear-shaped, obtuse leaves.

Variety.] With white flowers.

Green-house Kind.

8. GENISTA, *canariensis*.

Canary Broom, or Ever-green Cytisus, from the Canary Islands.] Genista with upright, woody, flexible stalks, branching six or eight feet high, into many angular branches, garnished with trifoliolate, hairy, ever-green leaves, and spikes of bright-yellow flowers from the ends of the branches.

They flower principally in May and June, and furnish plenty of seeds in autumn.

Of the above species, the first seven are har-

dy, deciduous, shrubby plants for the shrubbery, and the eighth, a tender ever-green for the green-house; they all possess merit as flowery plants, being very floriferous in May and June; and as to the hardy sorts, they are choice furniture for the fronts of the shrubbery clumps contiguous to the principal lawns and walks; and the sixth is a beautiful plant for the green-house collection, which must always be retained in pots for moving to the green-house in winter.

Propagation, &c.

All the hardy sorts are easily raised from seeds in a bed of common earth in autumn, i. e. September, October, or November, or in the spring, covering them with earth near an inch deep; they will rise in spring; and in spring following, when the plants are a year old, transplant them in nursery-rows; or if some are planted at once where they are to remain, they will succeed better, because, having long tough roots, they do not thrive well by removal when old; the green-house sort may also be raised abundantly by seed in spring, by aid of a moderate hot-bed, sowing the seed in pots; and plunge them in the hot-bed: when the plants are three or four inches high, prick them into separate small pots, and manage them as other green-house kinds.

GENTIANA, Gentian, and *Gentianella*.

The plants are principally hardy, herbaceous perennials, of the flowery and medical kind, of different growths, from three or four inches to three or four feet stature, ornamented with oblong, simple leaves, and largish, monopetalous, tubular, four or five-parted flowers.

Class and order, *Pentandria Digynia*.

Characters.] CALYX is oblong, quinquefid, and permanent. COROLLA is monopetalous, tubular at the base, and four or five-parted at the top. STAMINA, five short filaments and simple antheræ. PISTILLUM, a cylindric germen, no style, the germen crowned by two oval stigmas. PERICARPIUM, an oblong, bivalvate, unilocular capsule, and numerous seeds.

The principal species are,

1. GENTIANA *acaulis*.

Acaulous, or Short-stalked blue Gentian, commonly called Gentianella.] Gentian with thick fibry roots, crowned by oblong leaves, many flower-stalks but two or three inches high, exceeded by the corolla, garnished with spear-shaped, close-fitting, opposite leaves; and at top, large, bell-shaped, five-parted, erect, azure-blue flowers, of great beauty, appearing in May.

2. GENTIANA *asclepiadea*.

Asclepias-

Asclepias-leaved Gentian.] *Gentiana* with thick fibry roots, crowned by oval-lanceolate leaves, flower-stalks a foot high, garnished with oval, spear-shaped, amplexicaulous opposite leaves, and from each side largish, bell-shaped, blue flowers by pairs, appearing in June and July.

3. *GENTIANA Cruciata.*

(*Cruciata*)—or *Cross-wort Gentian.*] *Gentiana* with creeping fibry roots, weak flower-stalks six inches long, garnished with spear-shaped, opposite leaves by pairs, each pair crossing the other; and four-parted, light-blue flowers, in whorls below, and in clusters at top, appearing in May.

4. *GENTIANA lutea.*

Yellow Gentian Major, or Great Yellow Gentian.] *Gentiana* with thick, carrot-yellow roots, crowned by large, oval-oblong, pointed, veined, stiff leaves; strong flower-stalks three or four feet high, garnished with smaller, opposite, amplexicaulous leaves; and wheel-shaped, deeply five-parted, yellow flowers, in whorls at the upper parts, appearing very ornamental in July and August: it is also a valuable medical plant, and the root is the useful part.

5. *GENTIANA punctata.*

Dotted-flowered Gentian.] With flowers bell-shaped, mostly five-parted and dotted.

The plants are all perennial in root, but annual in stalk, which rise in spring, flower in summer, produce abundance of seed in autumn, and soon after die to the ground.

All the species, considered as flowery plants, are very ornamental; the low sorts are elegant furniture for the fronts of borders and other flower compartments, and the large yellow kind should be stationed more backward, among the taller class of plants, where it will exhibit a noble appearance; and as all the sorts prosper in any common soil, affording plenty of seed for propagation, several of them also increase by off-sets, they may be obtained plentifully in every garden.

All the sorts are easily raised from seed in the full ground, the first three sorts also by off-sets from the roots.

By seed.—Sow the seed in autumn, soon after it is ripe, or early in spring, in a bed or border of light rich ground, either by broad-cast on the surface, and rake it in lightly, or in shallow flat drills six inches asunder, covering it near half an inch deep; the plants will rise in April or May; give moderate watering in dry weather, and clear out weeds; and in summer and towards autumn, prick out a quantity of the best into beds, in rows six inches asunder, where let them re-

main a year to gather strength; then in autumn or spring transplant them into the places where they are to remain to flower.

By roots.—The first three species increase by off-sets of the roots in tolerable plenty; and autumn or spring is the time to separate or divide them; and the slips or off-sets, if small, may either be planted in nursery-beds for a year, or, if not divided too small, may place them at once in the flower compartments.

GENUS, a fraternity, race, or kind; being an assemblage of different species of plants, resembling each other in the flower and fruit, or parts of fructification.

The characteristical mark of every Genus is the whole of the flower or fructification; and all plants agreeing exactly therein are species of the same family or Genus; a Genus, therefore, may in some measure be compared to a family, all the relations of which bear the same surname, although every individual is distinguished by a particular specific name; and that by arranging under one generic name a collection of different species of plants, which although often ultimately different in their general growth, external port or habit, yet are all found invariably to possess certain relations in the generical characters of their essential parts, the fructification or flower and fruit, that declare them all plants of the same family or Genus.

A Genus of plants, therefore, however numerous the species, and different in their general growth, external habit, and duration, are such as agree in all the parts of the flower, which being the only generical characters, a principle now universally established by the Linnæan botany, in no case to be departed from (see CHARACTERS). For the *characters* of every Genus contain a description of each particular part of the flower, as the *Calyx*, *Corolla*, *Stamina*, *Pistillum*, *Pericarpium*, *Semen*, and *Receptaculum*; which being the seven parts of fructification, and the most essential and invariable parts of plants, and consequently the only parts that can determine the generical characters; and the striking singular mark of each of the above parts of the flower must run through all the species of each respective Genus, according to the descriptive *characters* in the beginning of every Genus throughout this work; whereby, as afore-mentioned, every such assemblage or plants, however few or numerous, so agreeing in their fructification, form a Genus.

By arranging every assemblage of plants agreeing in their fructification, under one denomination or generical name, renders botany

more simple and easy, which by the ancients was but little understood; as with them, almost every species was a Genus, and they had no conception of giving one common or general name to a number of plants, which, although agreeing in their flower, they could not discover possessed any thing in common; for the minute parts of the fructification which lay the foundation of our present systems, were then but little known, and as little attended to; as in fact the root, port or external habit of plants, their duration, mode, and times of flowering, and their uses, both medicinal and oeconomic, formerly furnished the sole characteristic distinction; all of which however, are vague and indeterminate; but as the fructification is constantly the same in the respective Genera, nothing but these parts can with certainty be employed in determining each separate Genus.

Plants and trees of the same Genus generally possess like medicinal powers. As for example, garlick, onion, and leek, belong to the Genus *allium*; cinnamon, camphire, and saffraus belong to the Genus *laurus*; southernwood, wormwood, mugwort, &c. belong to the Genus *artemisia*.

Trees which belong to the same Genus will also all take by grafting or budding upon each other: as for instance, pear, apple, and quince, being all of the Genus *pyrus*, take freely upon one another; plum, apricot, cherry, and bird-cherry, &c. being all of the Genus *prunus*, also grow upon stocks of each other; almond, peach, and nectarine, belonging to the Genus *amygdalus*, grow by budding upon one another, currant and gooseberry belong to the Genus *ribes*, and all the varieties will grow upon each other; though these are seldom grafted or budded; so that most generally all sorts of trees of the same family or genus will grow by grafting or budding upon each other: and some particular sorts, though not immediately under the same genus, but very nearly allied in relationship, will also take upon each other by grafting and budding, such as peaches, nectarines, and almonds, by budding upon plum stocks; but, except in some similar cases, trees of different genera never succeed either by grafting or budding upon one another.

The number of known Genera is upwards of twelve hundred, and above twenty-thousand different species, besides varieties; all of which are found growing in their natural state of wildness in some part of the globe or other; and most of them may be naturalised in our gardens, some in the open ground, others in the green-house and stove; but the gardener is not to be intimidated at the sight of that

great number, as if the care of so great a family was to fall to his lot; since our real valuable cultivated species fall vastly short of that number, yet sufficient to furnish our gardens most amply, both for oeconomic and ornamental purposes.

GERANIUM, Crane's-bill, but commonly called *Geranium*.

It comprises herbaceous and perennial and annual plants for the pleasure-ground, &c. obtaining different statures from one to two feet high, adorned with broad simple leaves, in some roundish, others heart-shaped and oval, some entire, and some divided, and clusters of small pentapetalous flowers.

Class and order, *Monadelphia Decandria*.

Characters.] CALYX, five oval permanent leaves. COROLLA, five oval, or else heart-shaped, spreading petals. STAMINA, ten monadelphous filaments alternately longer, and oblong, versatile antheræ. PISTILLUM, a five-cornered germen, long permanent style, and five-reflexed stigmas. PERICARPIUM, a long fruit, shaped like a crane's beak or bill, is quinquelocular, and contains five seeds.

There are many species in this genus; the following are the sorts principally cultivated in the British gardens, which are hardy and herbaceous; the other species, heretofore in this genus, consisting principally of shrubby kinds for the green-house, &c. the modern botanists, by late improvements in the botanic arrangements, have separated, and placed them in other genera; for which see ERODIUM, and PELARGONIUM.

1. GERANIUM *pratense*.

Meadow Crow-foot Geranium.] Geranium with many branchy stalks, two or three feet high, garnished with divided, target-shaped leaves of six or seven lobes, cut into many wing-like acute parts; and at the top of the stalks large blue flowers, two upon each foot-stalk.

Varieties.] With white flowers—variegated flowers.

2. GERANIUM *sanguineum*.

Bloody Geranium.] Geranium with thick, fleshy, fibry roots; weak, branchy stalks, a foot or more high, garnished with orbicular-divided leaves of five trifid lobes; and deep red or purple flowers from the side of the branches, one upon each foot-stalk.

Varieties.] With erect stalks—with deeply jagged leaves—and with variegated flowers.

3. GERANIUM *phaeum*.

Black-flowered Geranium.] Geranium with upright, branchy stalks, ten or twelve inches high, divided leaves, of five or six lacinated lobes,

lobes, and the branches terminated by blackish purple flowers, two upon each foot-stalk.

4. *GERANIUM nodosum.*

Knotty Geranium.] Geranium with-jointed, branchy stalks, six or eight inches high, garnished with divided leaves of three serrated lobes, those below having foot-stalks, the upper ones sit close, and at the ends of the branches, pale purple flowers by twos upon each foot-stalk.

5. *GERANIUM macrorrhizum.*

Long-rooted, Sweet-smelling Geranium.] Geranium with a long, thick, fleshy root; branchy stalks a foot high, garnished with five-lobed, smooth leaves, the lobes divided into many short, crenated segments, and the branches terminated by bunches of purple flowers, two upon each foot-stalk, and with inflated or bladder-like cups, and very long style.

6. *GERANIUM striatum.*

Striated Geranium.] Geranium with many branchy stalks, near two feet high, garnished with five-lobed leaves below, and three-lobed ones above, and white flowers beautifully striated with purple, two upon each foot-stalk.

7. *GERANIUM angulatum.*

Angular-stalked Geranium.] Geranium with many branching, erect, angular stalks, about two feet high, with seven-parted, palmate-lobed leaves below, and five-lobed, indented ones above; the flowers are flesh-coloured and marked with veins of a deeper red two or three on each foot-stalk.

8. *GERANIUM sibericum.*

Siberian Geranium.] Geranium with branching stalks, garnished with leaves acutely divided into five parts, and flowers growing from the side of the branches, each foot-stalk bearing a single flower.

The above eight species are very hardy fibrous perennials, durable in root, but annual in stalks, &c. which rise from the root in spring; flower in May, June, and July, producing a great profusion of flowers, each composed of five smallish spreading petals (see the *Characters*); and their number renders them very conspicuous; and are succeeded by plenty of seed in August and September, which if permitted to scatter on the ground, a crop of young plants will naturally rise in abundance.

Several of them grow naturally in many parts of England, particularly the first, second, third, and fourth sorts; the others are chiefly of foreign growth.

All the sorts prosper in any common soil of a garden.

They may all be employed as ornamental

plants for the embellishment of the different compartments of the pleasure-ground, and to increase the variety of the herbaceous collection: and as to their culture, they require only the common care of keeping clean from weeds, cutting down their decayed stalks, and digging between them annually in autumn, or any time in winter or spring.

They may all be propagated plentifully by seed, and by parting their roots.

By Seed.—Sow it in autumn soon after it is ripe, or in spring in a shady border, and rake it in lightly; when the young plants are about three inches high, prick them out in beds five or six inches asunder, giving occasional waterings; and in autumn or spring after, transplant them where they are to remain.

By Parting the Roots.—This may be performed any time from October till March, in open weather; do not divide them into too small slips; and may plant them at once where they are to remain.

African Geranium. See PELARGONIUM.

Pentandrious Geranium. See ERODIUM.

GERMEN, the seed-bud, i. e. the base of the pistillum, situated in the bottom of the flower, and containing the rudiments of the seed, and in progress of vegetation swells, and becomes the seed-vessel.

The Germen in most plants is situated in the bottom of the flower; in some however, within the corolla, and in others, under its base, and which always supports the style and stigma, the female organs of generation: wherefore modern botanists denominate the seed-bud or Germen, the *Ovarium* or *Uterus* of plants, which, after its impregnation by the male dust of the antheræ or male organ falling upon the stigma, it becomes a seed-vessel, gradually ripening to maturity, together with the seeds contained therein.

GERMINATIO, the Germination or sprouting of seeds, after being committed to the earth.

Different sorts of seeds are longer or shorter in germinating, and rising according to their nature, and heat requisite for each; several of the grasses often rise in one day; cresses, mustard, radish, rape, and turnep, in from three to six or eight days; cucumber, melon, gourd, cabbage, favoy, cauliflower, broccoli, beet, spinach, lettuce, purslane, dill, orach, bean, kidney-bean, pea, &c. in from about three or four, to ten or fifteen days; onion, leek, carrot, parsnep, celery, in from about ten or twelve, to eighteen or twenty days; parsley, from about fifteen or twenty, to forty or fifty days; hawthorn, medlar, holly, and several other hard, bony seeds, and nuts, are often

often two years before they germinate; and some of the liliaceous plants never rise at all; observing, that in respect to the above observations of the germination of seed, it is principally to be understood of seeds sown in spring and summer; and the more advanced and warm the season, the sooner may the seed be expected to rise.

Seeds also preserve their germinating property shorter or longer according to their kinds; some do not retain it scarcely a year, others for a series of years; particularly many of the papilionaceous tribe: and it is asserted, that the sensitive plant retains its germinating faculty for thirty or forty years.

Most seeds germinate the most freely when sown in spring and summer; some however require to be sown in autumn, soon after they are ripe, otherwise they will not sprout in less than a year or two; which sorts are always hinted in the course of the work, under their respective articles.

As air and moisture are the agents of vegetation, it is for want of air that seeds which are buried at a very great depth in the earth, either rise but indifferently or not at all; they frequently however preserve their germinating property for many years within the bowels of the earth; and it is not unusual, upon a piece of ground being dug up to a considerable depth, to see it covered with several plants, which probably have not been seen there in the memory of man. Seeds will also retain their vegetative virtue for years in the bottom of wells, ditches, ponds, &c. which when cleared out, and the mud exposed to the air, various sorts of plants have risen therein, that had not appeared thereabouts for a great number of years; by which circumstances, certain species of plants, regarded as lost, have been accidentally recovered.

GEUM, Avens, or Herb-bennet.

The plants are hardy, herbaceous perennials for the pleasure-ground, rising with annual stalks about a foot high, terminated by pentapetalous flowers.

Class and order, *Icosandria Polygynia*.

Characters.] CALYX is monophyllous, cut into ten segments, alternately smaller. COROLLA, five roundish petals, long and narrow toward the base. STAMINA, twenty, or numerous filaments, and broad obtuse antheræ. PISTILLUM, numerous germina collected into a head, and many long, hairy styles, and simple stigmas.—PERICARPUM, none, numerous seeds sitting on the oblong receptacle placed on the calyx.

The principal species are;

1. *GEUM urbanum*.

Urbanous Common Avens or Herb-bennet.] Geum with thick, fibry, aromatic roots, crowned by large, lyre-shaped, rough, serrated leaves, and upright, round, hairy stalks, a foot high, terminated by largish yellow flowers, succeeded by globular fruit.

This grows wild in woods and by hedge sides in England, &c. the root is used in medicine, and the young leaves often as a pot-herb.

2. *GEUM rivale*.

River, or Marsh nodding-flowered Avens.] Geum with a thick, fleshy, very fibry root, crowned with large lyrate, hairy leaves, and upright stalks ten or twelve inches high, terminated by purple flowers nodding on one side.

Varieties.] With red flowers—large yellow flowers.

3. *GEUM virginianum*.

Virginia ternate-leaved Avens.] Geum with upright stalks a foot and a half high, ternate leaves below, those above simple, and the stalks terminated by small white flowers.

4. *GEUM montanum*.

Mountain Avens of the Alps.] Geum with a thick, fleshy, fibrated, creeping root, crowned with leaves composed of several small irregular lobes terminated by a broad roundish one, and slender stalks near a foot high, garnished with narrow sharp-pointed leaves, and terminated by solitary yellow flowers.

Variety.] Dwarf Alpine Avens, with a large golden flower.

All these plants have perennial roots and annual stalks, which rise in spring, flower in May and June, and ripen seeds in July and August. The plants are hardy, and succeed almost any where.

They may be introduced in the pleasure-ground here and there towards the fronts of the flower and shrubbery compartments, to increase the variety.

Their propagation is both by seed, and by parting the roots. Sow the seed in September in a bed or border, and the plants will rise in spring. By parting the roots, it may be done any time in open weather, from September till March.

GLADIOLUS, Gladiolus, Sword-lily, or Corn-flag.

The plants are tuberous-rooted, herbaceous, flowery perennials, of the liliaceous tribe, for the pleasure-garden, and green-house; having sword-shaped leaves, and erect annual stalks two feet high, adorned with hexapetalous, lily-like flowers.

Class and order, *Triandria Monogynia*.

Characters.] CALYX, a spathe to each flower. COROLLA, six oblong petals united at their base, the three upper ones inclining together,

together, and the under ones spread open. STAMINA, three filaments, inserted into every other petal, and oblong antheræ. PISTIL-LUM, a germen under the corolla, single style, and trifid concave stigma. PERICARPUM, an oblong, ventricose, trigonal, trilocular capsule, and roundish seeds.

There is but one hardy species common to the English gardens, out of which are many eminent varieties.

1. GLADIOLUS *Communis*.

Common Gladiole.] Gladiolus with a round, depressed, tuberous, bulb-like root, sending up long sword-shaped leaves, embracing each other at the base; between them an erect flower-stalk two or three feet high, the top garnished with several largish flowers at a distance, of different colours in the varieties, and in some ranged all on one side of the stalk, and in others in two ranges, &c.

Varieties.] Common red Gladiolus, with flowers ranged on one side of the stalk—purple flowers on one side of the stalk—white flowers on one side of the stalk—crimson flowers on one side of the stalk—red flowers ranged in a double series—white flowers in a double series—broad leaved, tall Gladiole, with large purple flowers—broad leaves, and large crimson flowers. All of which are varieties of one species, as the seed saved from one plant often produces them all. They all flower in the end of May; and in June; are very conspicuous and ornamental, and are succeeded by plenty of seed in August, and their stalks and leaves decay soon after.

2. GLADIOLUS *imbricatus*.

Imbricated flowered Russian Gladiole.] Gladiole with sword-formed leaves, and flowers imbricated over one another.

The plants are very hardy, and will flourish almost any where, and increase greatly by their roots, especially the common red sort, so as often to become troublesome.

They are proper furniture for the common flower borders, &c. intermixed with other perennials of similar growth, where they will exhibit a very fine appearance when in flower.

The time to plant them is September, October, and November, or early in the spring. They should be taken up every two or three years at the decay of the leaves, to separate the off-sets, &c.

All the varieties are propagated plentifully by off-sets from the roots, which they emit in abundance every year like tulips and other bulbs. July and the beginning of August, when the stalks and leaves decay, is the time to take up the roots to separate the off-sets, or to transplant the roots from one place to another;

though, if taken up at the proper time, they may be kept out of the ground till October or November, or longer if necessary.

They may also be propagated by seed. Sow it in autumn in a bed or border of light earth; the plants will come up in the spring, and when their leaves decay in summer, transplant them into nursery-beds to remain a year or two, till of due size to flower; then transplant them where they are to remain.

The principal green-house species are,

3. GLADIOLUS *cardinalis*.

Scarlet Superb Gladiolus.] Gladiolus with a bulbous root, many-nerved, sword-shaped leaves, and an erect large scarlet corolla, with a bell-shaped border.

4. GLADIOLUS *angustus*.

Narrow-leaved Gladiolus.] Gladiolus with a round bulbous root, linear leaves, and flowers distant on the spikes.

5. GLADIOLUS *tristis*.

Sad-flowered Gladiolus.] Gladiolus with an oval bulbous root, linear cross-shaped leaves, and dull-purple, and cream-coloured campanulated flowers.

These species are propagated as the *Gladiolus communis*, but require the protection of the green-house in winter.

GLASS-CASE, in gardening, is a light airy erection of glass sashes, in proper framework, upright in the front and ends, and sloping at top from a back wall, north, to the front, southward; the front, top, and both ends being all glass-work framing; and is useful wherein to protect many sorts of curious or tenderish plants in winter; which want only occasional protection from severe frost, and for other similar purposes—and some other occasions.

This Glass-Case erection is constructed occasionally, either against some ready-built commodious south wall, which serves for the back, all the other parts forward being wood-work and glass, or erected detached in a similar situation, so as the whole front stands southwards, the back being formed of brick-work, &c. or of wood double planked; but the former is preferable; and the whole generally ranged longways, nearly east and west, with the front southward to the full sun; in dimensions five or six, to eight or ten feet wide, by ten, fifteen, or twenty feet long, or more, as may be required; six or eight, to ten feet high behind, by five or six, to seven or eight in the front, both ends in proportion with the top, sloping from the back-wall to the front erection, having an entrance door in front, or one end: the front, both ends, and top, being all glass-work, as before intimated,

are

are made to slide open; and if some fire flues are carried along the back and front internally, proceeding from an external furnace, for occasional fire heat in winter, it would be more effectual to serve particular purposes.

A Glass-Case, as above, is occasionally used as a preservatory department in which to winter many sorts of curious exotics, both of the hardier green-house kinds, which only want protection from severe cold, as also many choice kinds of the open ground which are rather tenderish in their minor growth, or any other particular or curious hardy plants, both of flowers, shrubs, and young trees, especially some principal choice evergreen kinds, to protect them more effectually from the ravages of rigorous frosts or cutting blasts in winter and early spring; and at the same time, when mild open weather, can enjoy the full air by opening the glasses accordingly; all which, intended for such occasional protection, being in pots, can be readily placed in this preservatory at the approach of severe weather, and be thus preserved in good condition till settled weather in spring, &c. then removed into the full air: and the said Glass-Case, in summer and autumn, when unoccupied on the above occasion, will be of utility, in which to place some kinds of curious tender plants when in flower for seeding, to guard them from heavy or incessant rain or cold night dews in autumn, which, in many sorts, would retard, or sometimes wholly frustrate their production of good seed, as in some sorts of curious tender annuals, particularly the fine double balsamines, cock's-combs, tricolors, double stramoniums, diamond ficoides, &c.

Likewise a Glass-Case, as above, is occasionally used in spring and early part of summer, April, May, and June, as a kind of drawing-frame, in which to draw some particular sorts of curious annuals to a tall growth where required, such as the large or giant cock's-combs, tricolors, double-stramoniums, double-striped balsams, egg-plants, &c. the plants being first raised in hot-beds under garden-frames, till of twelve or fifteen inches growth, then a hot-bed being made in the Glass-Case, earthed at top, and the plants in pots singly, are then plunged into the earth of the hot-bed—the glasses shut close, only giving necessary admission of fresh air every day, they will here run up to a tall stature, in the best perfection of strength and flowering.—See *Annual Plants*, also *Celosia cristata*, or cock's-comb, and *Amaranthus tricolor*, &c.

A Glass-Case is also sometimes adopted as an appurtenance to a hot-house or stove, but detached therefrom, having internal flues for

fire-heat in winter, and to serve as a preservatory residence for many sorts of exotics, which being rather tenderer than common green-house plants, yet do not require the constant full heat as the more tender kinds, which need the temperature of a pine-apple stove or hot-house, but only to have the assistance of moderate fire-heat in winter, in cold nights, and when very damp, cloudy, foggy weather, and in severe frosts, &c. and that in mild temperate weather require only a very moderate aid of fire-heat.

Sometimes a kind of similar Glass-Case is used in the business of forcing several kinds of flowering plants and esculents, either by means of an internal bark-bed, or flues for fire-heat; or that, when intended for this purpose, it is eligible to have both an internal pit for a bark-bed aforesaid, and flues for fire, to use either of them separately, or sometimes both on particular occasions.

GLEDITSIA, Three-thorned Acacia.

There is but one species, a large deciduous tree for ornamental plantations, adorned with beautiful pinnated foliage, and amentaceous male and hermaphrodite flowers on the same plant, and females on separate trees.

Class and order, *Polygamia Diœcia*.

Characters.] CALYX, male flowers collected in a long compact cylindric catkin, terminated by the hermaphrodites, each having a three-leaved cup, and female flowers on separate plants, having a five-parted calyx. COROLLA, three roundish petals in the males and hermaphrodites, and five long acute ones in the females. STAMINA, six filaments and oblong antheræ. PISTILLUM, a broad germen longer than the corolla, short reflexed style, and thick stigma. PERICARPIUM, a large flat pod, having transverse partitions, each division replete with pulp, and one hard round seed.

The species is,

GLEDITSIA *triacanthos*.

Three-thorned Acacia.] Gleditsia with an upright trunk, rising thirty or forty feet high, branching out regularly, and having the stem and branches armed with many long triple thorns, and closely garnished with doubly pinnated leaves, each leaf consisting often of near two hundred smaller leaves or foliola; and amentaceous greenish flowers from the sides of the branches, succeeded by broad seed-pods near a foot and half long.

Varieties.] With fewer thorns, smaller leaves, and oval pods.—With very strong thorns.

These trees have singular beauty in summer, when cloathed with their large, long, pinnated foliage, which spread open delightfully in fine weather, but rather droop and contract at the approach

approach of bad. They flower in July; but the flowers being of an herbaceous colour, make but little appearance; but their large seed-pods have a fine effect, though these do not often attain perfection in England.

They are natives originally of America, but grow freely here in any situation.

Both the varieties are fine furniture for all ornamental plantations and shrubbery-work, &c. and have an admirable effect, placed singly in large opens of grass ground.

Propagation.

Their propagation is by seeds, which are annually procured from America by the seed-men: sow them in spring in a warm border of light earth half an inch deep, giving occasional watering in dry weather, and the plants will rise the same season; and by spring following, the largest will be fit to transplant, and in spring after, all the rest; planting them in nursery-rows, one foot by two asunder, to remain till a yard or two high.

GLOBULARIA, Globular blue Daisy.

The plants are herbaceous, flowery perennials, producing annual stalks from about six to ten or twelve inches high, surmounted by globular heads of blue flowers.

Class and order, Tetrandria Monogynia.

Characters.] CALYX, a general cup, containing many florets, each having a monophyllous cup, five-parted at top. COROLLA, the general flower consists of many florets collected into a globular head; each floret is monopetalous, tubular, and five-parted at the brim. STAMINA, four filaments, and incumbent antheræ. PISTILLUM, an oval germen, single style, and obtuse stigma. PERICARPIUM, none; one seed to each floret, lodged in its calyx.

There is but one species common to our gardens, viz.

GLOBULARIA vulgaris.

Common Globularia.] Globularia with broad, thick, radical leaves, three-parted at the ends; upright stalks from about six to ten or twelve inches high, garnished with spear-shaped leaves; and the top crowned by a globular head of fine blue flowers, composed of many florets in one general cup. See the *Characters*.

It flowers in June and makes a good appearance towards the fronts of the flower-borders, but flowers best in a shady moist situation.

The propagation is effected by parting the roots in September.

GLORIOSA, Superb Lily.

It is a tender, herbaceous, flowering perennial for the stove, producing trailing, annual stalks several feet long, and hexapetalous liliaceous flowers.

Class and order, Hexandria Monogynia.

Characters.] CALYX, none. COROLLA, six oblong, spear shaped, waved, extremely long petals, wholly reflexed back. STAMINA, six spreading filaments, and incumbent antheræ. PISTILLUM, a globular germen, slender inclined style, and triple stigma. PERICARPIUM, an oval, trilocular capsule, and many globular seeds.

There is but one species, viz

GLORIOSA superba.

Superb Lily.] Gloriosa with a thick, fleshy, tuberous root; sending forth from its centre declinated round stalks, growing eight or ten feet long, garnished with very long, narrow leaves, running out to a point, terminated by a long tendril; and from the upper part of the stalks, large flame-coloured drooping flowers of six widely spreading reflexed petals.

It flowers in June and July, and is of admirable beauty, hence it derives the name *Gloriosa*, or Superb Lily.

This plant being a native of Ceylon and Malabar, very warm countries, requires the protection of the hot-house here, so must be kept in pots of light earth, and placed constantly in that department. The flower-stalks shoot forth in March or April, which being long, and of trailing growth, must have tall sticks placed for their support: water them frequently in summer during their growth; but give very little after their flowers and stalks decay.

The time for removing the roots either for increase, or to transplant into fresh earth, &c. is in autumn when their stalks decay, or early in spring before they begin to shoot.

It is propagated by off-sets of the roots, which they yield in tolerable plenty, and may be separated any time after the stalks decay, or in spring before new ones arise.

GLOXINIA.

This genus consists of a perennial, herbaceous, flowery plant, garnished with oblong leaves, and terminated by spikes of bell-shaped flowers.

Class and order, Didynamia Angiospermia.

Characters.] CALYX is five-parted, and withering. COROLLA, bell-shaped, with the border oblique. STAMINA, with the rudiment, five filaments, inserted in the receptacle, and connivent antheræ. PISTILLUM, an oblong germen, simple style, and bilobed stigma. PERICARPIUM, an oblong quadrangular capsule, with five cells, having oblong seeds.

Of this genus there is but one species, viz.

GLOXINIA maculata.

Spotted Gloxinia.] Hath thick, fleshy, knotty roots, sending up several robust, simple, succulent,

fucculent, purplish stalks, a foot high, garnished with oblong, serrated, thick, close-fitting leaves, and terminated by short spikes of blue bell-shaped flowers.

As the seeds of this plant rarely ripen in England, it must therefore be propagated by dividing the roots in the spring, planting each off-set in a pot of rich mould, and plunged in the bark-bed, where they must continually remain. It may also be increased by cuttings of the stalks planted in pots, and plunged as aforesaid.

GLUMA, Glume.

This is a species of calyx consisting of two or three membranous valves which are often pellucid at their edges; this kind of cup belongs to the grasses, rushes, and other triandrous plants.

GLYCINE, knobbed-rooted Liquorice Vetch.

This genus furnishes three shrubby volubilate climbers of America, &c. for the pleasure-ground and green-house, mounting upon support by their twining climbing stalks, many feet high, adorned with large, noble, pinnated foliage, and fine papilionaceous, blue, scarlet, and reddish flowers, in the different species.

Class and order, *Diadelphia Decandria*.

Characters.] CALYX is monophyllous and bilabiated. COROLLA is papilionaceous, having a heart-shaped vexillum, small, oblong-oval wings; and narrow sickle-shaped keel. STAMINA, ten diadelphous filaments, and single antheræ. PISTILLUM, an oblong germen, spiral style, and obtuse stigma. PERICARPIUM, an oblong pod, and kidney-shaped seed.

The species are,

1. GLYCINE frutescens.

Shrubby Glycine, commonly called Carolina Kidney-bean-tree.] Glycine with shrubby climbing stalks, twining round any support, fifteen or twenty feet high, adorned with pinnated leaves of three pair of folioles, terminated by an odd one, and from the axillas, clusters of large bluish-purple flowers, succeeded by long pods, like those of the climbing kidney-bean.

2. GLYCINE coccinea.

Scarlet Glycine.] Glycine with a shrubby, climbing stem, which, if supported, will grow to the height of many feet, producing a great number of flowers on its pendent branches: the leaves grow three together, and are nearly round; the flowers, which arise from the axillas of the leaves, grow, for the most part, in pairs, are of a deep scarlet colour, with the bottom of the vexillum decorated with a large yellow spot.

3. GLYCINE rubicunda.

Reddish, dingy-flowered Glycine.] Glycine with a shrubby, twining stem, running up to the height of five, six, or more feet, furnished with ternate leaves, the folioles almost oval and entire; from the axillæ of the leaves arise the flowers, growing in threes; they are large and showy, and are of a dull-red colour.

These are elegant shrubby climbers, ornamental both in foliage and flowers, and curious in their lofty climbing growth, in the volubilate order; flowering generally in July and August, but do not ripen seed in this country. They may be introduced in principal compartments in the pleasure-ground; and some of the second and third sorts kept also in pots, to be housed in winter.

They are easily propagated by seed.

By Seed.—This is imported annually. Sow it in spring in a bed of light earth, half an inch deep; give the young plants occasional protection of mats from frost the following winter; in spring plant out some of the largest in nursery-rows, and in spring after put out the remainder.

By Layers.—In autumn lay down the young shoots in the earth, and by that time twelve-month they will be rooted and fit to transplant.

GLYCYRRHIZA, Liquorice.

This genus furnishes one valuable herbaceous perennial for medical use, producing annual stalks a yard or more high, pinnated leaves, and papilionaceous flowers.

Class and order, *Diadelphia Decandria*.

Characters.] CALYX is monophyllous, tubular, and bilabiated. COROLLA is papilionaceous, having a long, erect vexillum, oblong wings, and dipetalous carina. STAMINA, ten diadelphous filaments and roundish antheræ. PISTILLUM, a short germen, slender style, and rising obtuse stigma. PERICARPIUM, an oval or oblong pod, and kidney-shaped seed.

The most material species are,

1. GLYCYRRHIZA glabra.

Smooth-podded Glycyrrhiza, or Common Liquorice.] Glycyrrhiza with a long, thick, creeping root, striking several feet deep into the ground; upright, firm, herbaceous stalks, annually, three or four feet high, garnished with winged leaves of four or five pair of oval lobes, terminated by an odd one; and from the axillas erect spikes of pale-blue flowers in July, succeeded by short smooth pods.

The root of this is the useful part, which is replete with a sweet, balsamic, pectoral juice, much used in all compositions for coughs and disorders of the stomach.

2. GLYCYRRHIZA echinata.

Echinated

Echinated or Prickly-podded Liquorice.] It is nearly like the common sort, only the seed-pods are prickly.

Both these species are very hardy perennials, but the first species is the sort commonly cultivated for use, its roots being fuller of juice and sweeter than the other.

The roots are perennial, but the stalks rise in spring, and decay in autumn.

They delight in a deep light soil, in which the roots will run down three or four feet deep, and attain a large size if permitted to stand three or four years; and from the main root smaller ones run off horizontally; and from these horizontal roots, that run near the surface, cuttings for sets or young plants are taken for propagation, which are generally procured at the time when the Liquorice is taken up for use, being fit in three years after planting. But cuttings for planting may be occasionally taken off before that period, if particularly wanted.

Where large quantities are required for sale, they may be cultivated in fields, as practised in many parts of England; vast quantities are also raised in some of the kitchen-gardens about London, where, by the richness and depth of the ground, the roots attain their utmost perfection in length and bulk.

The length and thickness of the roots is a principal consideration to the planter, as they are always sold by weight.

Propagation and Culture.

Their propagation is, as above described, effected by cuttings of the small roots issuing from the sides of the main ones, near the surface of the earth, dividing them into lengths of six or eight inches, each having one or more good buds or eyes; and the proper season for procuring the sets for planting is any time, in open weather, from October till March, though from the middle of February, till the middle of March, is rather the most successful season for planting.

An open situation is the most suitable for a plantation of these plants.

Particular regard should also be had to the soil; it ought to be of a light, loose temperature, and three or four feet deep if possible; for the roots of the Liquorice will arrive at that depth and more; and the longer the roots, the more valuable they are for sale by weight.

Having fixed on the ground, let it be trenched two or three spades deep, if the depth of proper soil will admit; then having your sets ready, proceed to plant them by line and dibble, planting the sets a foot distance in each row; putting them perpendicular into the ground, with the tops about an inch under the surface, and let the rows be a foot and a half asunder; though

the London gardeners seldom allow more than twelve inches between row and row; these gardeners also sow a crop of onions on the same ground the first year, which, as the onions root but slender, and spread but little at top, may be done without any detriment to the Liquorice, nor that to the onions, as it does not rise above ten or twelve inches high the first summer; observing to keep the ground clean from weeds during that season by hoeing; and if there is a crop of onions, use the small hoe, cutting out the onions to four or five inches distance, clearing away such as grow immediately close to the Liquorice plants; and when the onions are gathered, give the ground a thorough hoeing with a large hoe, to loosen the surface, and destroy all weeds effectually; and in autumn cut down the decayed stalks of the Liquorice, and nothing more is necessary to be done till spring; when, in February or March, give a slight digging between the rows, and, during spring and summer, keep down all weeds by broad-hoeing; and in autumn, when the stalks are in a decaying state, cut them down to the surface of the earth as before observed. The same work is to be repeated every succeeding year: that is, slightly stir the ground in spring, keeping down all weeds in summer by hoeing; but after the first or second year, the stalks of the Liquorice will shoot strongly, and soon cover the ground, so as greatly to retard the growth of weeds.

Likewise every autumn, about October, when the stalks begin to decay, cut them down to the ground and clear them off.

In three years after planting, the roots of the Liquorice will be fit to take up; and the proper season for this is any time from the beginning of November till February; for it should neither be taken up before the stalks are fully decayed, nor deferred till late in spring, otherwise the roots will be apt to shrink and diminish in weight.

The method of taking up the Liquorice is by trenching the ground, beginning at one end, and open a trench close to the first row three spades deep, or to the depth of the roots; at which work, three or four spademen are generally employed at each trench; one goes on with the top spit, a second with the next spit, another with a third spit, and the fourth spademan commonly gets to the bottom of the roots, having a mattock to assist him occasionally to clear them, so, as he takes them up, throws them on the top of the ground; and in this manner proceed row and row, till the whole plantation is taken up.

The small side-roots are trimmed off, and

the best divided into lengths for fresh sets, and the main roots are tied in bundles ready for sale.

It is of advantage to sell them as soon as possible after they are taken up, before they lose much of their weight.

GNAPHALIUM; Cudweed, Goldy-locks, Eternal-flower, Everlasting, &c.

This genus consists of herbaceous and small under-shrubby flowering perennials for the open ground and green-house, of different statures, from six or eight inches, to four or five feet, adorned mostly with white hoary leaves, and terminated by compound flowers in corymbose clusters, remarkable for retaining their beauty for years after being gathered.

Class and order, *Syngenesia Polygamia Superflua*.

Characters.] CALYX, compound flowers, having a roundish, imbricated, permanent, general cup. COROLLA, many hermaphrodite and female florets in one general cup; the females have no petals. STAMINA, five filaments, and cylindric antheræ. PISTILLUM, an oval germen, filiform style, and bifid stigma. PERICARPIUM, none: the calyx is permanent and glossy; and the seeds are single under each floret, and crowned with down.

The most material species in the English gardens are the following three hardy, and four tender kinds.

Hardy Kinds.

1. GNAPHALIUM *margaritaceum*.

Pearly-white Eternal-flower.] Gnaphalium with creeping, very spreading roots, crowned with broad, spear-shaped, white, hoary leaves; herbaceous, thick, woolly stalks, a foot and half high, branching out upward, garnished with long, acute-pointed, white woolly leaves placed alternate, and each branch terminated by a corymbose cluster of yellowish flowers, in large, prickly, white, permanent cups, appearing in June and July, very ornamental; and which, if gathered in a dry day soon after they appear, will retain their beauty some years; hence it is often called everlasting, or eternal flower.

This spreads and multiplies exceedingly by its creeping roots.

2. GNAPHALIUM, *plantaginifolium*.

Plantain-leaved Cudweed.] Gnaphalium with large, oval, woolly, radical leaves; farmentous, procumbent, running shoots rooting in the ground, and herbaceous, simple stalks six or eight inches high, terminated by a corymbus of white flowers in June, July, &c.

This also multiplies greatly by its off-set-runners rooting in the earth.

3. GNAPHALIUM *Stæchas*.

Narrow-leaved Stæchas.] Gnaphalium with a shrubby stalk, branching into long, slender stalks three feet high, covered with a white bark, narrow leaves, hoary underneath, and all the branches terminated by compound corymbose clusters of yellow flowers appearing from May or June, to the end of summer, and which, if gathered dry, will continue some years.

Tender Kinds.

4. GNAPHALIUM *Orientele*.

Oriental Goldy-locks, or Immortal Flower.] Of which there are the following *Varieties*.

Dwarf Oriental Goldy-locks.—Hath a short, shrubby stalk, a few inches high, branching out into many heads, garnished with narrow, woolly leaves, and from the heads, flower-stalks six or eight inches long, terminated by a compound corymbose of golden yellow flowers.

Narrow-leaved Oriental Immortal Flower.—Hath shrubby stalks, branching two or three feet high, long, spear-shaped, woolly leaves, and the branches terminated by a compound corymbus of golden yellow flowers—likewise a variety with silvery white flowers.

Broad-leaved Oriental Immortal Flower.—Hath broad, spear-shaped, white, woolly, radical leaves; woolly stalks branching a foot and half high, adorned with spear-shaped woolly leaves; and the branches terminated by compound clusters of golden yellow flowers.

These three varieties of *Gnaphalium Orientale* flower in May and June, and often continue in succession great part of summer; and if those of all the sorts are gathered before they are too ripe, in a dry day, they remain beautiful for many years; hence the name Immortal flower, &c.

5. GNAPHALIUM *odoratissimum*.

Most Odorous, or Sweet-scented Eternal Flower.] Gnaphalium with shrubby-winged stalks, branching irregularly a yard high, oblong, blunt leaves, hoary underneath, and decurrent, having a wing or border running along the stalk or branch, and the branches terminated by compound, close, corymbose clusters of bright gold-coloured flowers, changing to a dark yellow.

6. GNAPHALIUM *arboresum*.

Tree Gnaphalium.] Gnaphalium with a woody stem, branching four or five feet high, narrow sessile leaves, with revolute borders, smooth on their upper side, and roundish bunches of pale yellow flowers.

7. GNAPHALIUM *ignescens*.

Red-flowered Gnaphalium.] Gnaphalium with a shrubby branching stem, a foot high, sessile,

sessile, lanceolate, downy leaves, and a corymbus of globose, orange-coloured flowers, changing to a red.

The flowers of all these species of *Gnaphalium* are compound, having many small florets, common to one general cup or calyx, which is persistent, dry, and shining (see the *Characters*); and generally all terminate the branches in a compound, compact corymbus, and all of which, the flower-heads being dry, scaly, and parched, they, without any assistance of water, possess the singular property of retaining their beauty in their proper colours for several years, if kept dry and clean.

Most of the sorts come into flower about June, and continue great part of summer.

The first three sorts are hardy, and may be employed as plants of ornament, in any compartment of the pleasure-ground, for they will thrive in any soil and situation; the two first of which increase exceedingly by their roots, and rooting shoots, which may be taken off in autumn or spring, and planted where they are to remain; and the third sort being shrubby, is propagated also by planting slips or cuttings of its shoots any time in spring or summer, in a shady border.

But the fourth, fifth, sixth, and seventh species are somewhat tender, and some should be kept in pots, to be sheltered in a green-house or garden-frame in winter; others may be planted in the full ground in a warm, dry situation, especially the oriental kind, and varieties, also, the sweet-scented sort; for these two species will struggle tolerably through an ordinary winter, and make a pretty appearance during the summer months. All these being shrubby, are propagated by slips or cuttings of their shoots, any time in spring or summer; planted either in borders of natural earth, and covered with hand-glasses till rooted, or by planting them in pots, and placing them in a hot-bed, which will bring them forwarder.

GOMPHRENA, *Globe Amaranthus*.

In this genus there are two tender, very ornamental-flowering annuals, and varieties, of two or three feet stature, adorned with simple, entire foliage, and globular heads of aggregate florets.

Class and order, *Pentandria Digynia*.

Characters.] **CALYX**, many florets, collected into a capitulum or head, each having a diphyllous, coloured, permanent cup. **COROLLA**, numerous, small, erect florets, collected into a close head; each floret five-parted at the brim, and has a five-parted nectarium. **STAMINA**, five scarce discernible filaments. **PISTILLUM**, in each floret an oval germen, two small styles, and simple

stigmas. **PERICARPIUM**, a small, roundish capsule succeeding each floret, and one roundish seed.

The species is,

GOMPHRENA *Globosa*.

Globular-headed Indian Gomphrena, commonly called Globe Amaranthus.] Gomphrena with an upright stalk, branching erectly all around, two or three feet high; the branches by pairs opposite, each pair crossing the other; garnished with oval-lanceolate, opposite leaves, and every branch and side-shoot terminated by a close globular head of flowers, composed of numerous very small starry florets closely covered with dry scaly calices placed imbricatum, persistent, and beautifully coloured, and in which consists the beauty of the flowers, which are of different colours in the varieties.

Varieties are,] Globe amaranthus with purple heads—with white or silvery heads—with red heads—with striped or variegated heads—with spiked heads.

GOMPHRENA *interrupta*.

Interrupted-spiked Gomphrena.] With an erect, branchy stem, the branches terminated by the flowers in spikes, interrupted by smaller between the larger ones.

Of the above two species, the first is the most noted and beautiful in its mode of flowering; and of which all the varieties are very floriferous and ornamental; they divide into many branches, each of these sending forth many axillary foot-stalks, each supporting a round head of flowers, accompanied by two leaves, appearing from June till November, succeeded by plenty of ripe seeds.

They are tender plants of the annual tribe, rising from seed in spring, and totally perishing at the approach of winter.

The flowers themselves are separately so small, and closely covered with the scaly calices, that they scarcely appear; so that the numerous, closely placed, scaly coverings, being of a dry, firm consistence, coloured and glittering, collected into a compact, round head, the size of an ordinary cherry, are very conspicuous, and make a very ornamental appearance.

These flowers, if gathered when at full growth, and placed to dry out of the sun, will retain their beauty several months.

The plants being natives of India, are of tender quality here, requiring aid of artificial warmth of hot-beds to raise and forward them to a proper state of growth, so as to flower in perfection, and produce ripe seed; therefore, they are raised in hot-beds under glasses in spring, and retained there till June; for they will

will not bear the open air here till the middle or latter end of that month.

They are commonly cultivated in pots, and placed to adorn fore-courts, and other conspicuous compartments, in assemblage with other curious annuals, though they may also be planted out into the open borders, &c.

Propagation and Culture.

All the varieties are propagated only by seed sown annually in March, or beginning of April, in hot-beds under glasses; as for *amaranthus*, and the *celosia cristata*, or *cock's-comb*.

The seeds being closely enveloped in their scaly, chaffy covering, it should be pulled to pieces and separated as well as possible, and having the hot-bed ready, as directed for the *amaranthus* and other tender annuals, sow the seed either in the earth of the bed in small drills, or on the surface, covering it a quarter of an inch deep with fine mould; or may be sown in pots, and plunge them in the hot-bed, as shall be convenient: the plants will come up in a week or ten days, and when they are an inch high, they should be pricked down either in the same bed, if of good heat, or in a fresh one, three or four inches distance, giving water, occasional shade, and fresh air. Here let them grow three weeks or a month, when they will be considerably increased in growth, and should be transplanted into another hot-bed, at six or eight inches distance, or may now plant them in pots (thirty-twos), and plunge them in the hot-bed, under a deep frame, to draw them up tall, where they may grow till June, then shifted into larger pots; observing, at each removal, to give water and shade occasionally till rooted, and give fresh air daily at the upper end of the lights, and frequent waterings, managing them in every respect as directed for the *amaranthus*, *cock's-comb*, and other tender annuals (see ANNUAL PLANTS). And in June inure them gradually to the full air; and if any are not potted, transplant them therein with balls about their roots; and towards the middle or latter end of that month may remove them into the full air entirely, at which time also, or any time in June, if you intend to plant any in the borders, should then transplant them from the hot-bed with balls about their roots, or as may be convenient; giving the whole water at planting.

During summer, those in the pots should be watered three or four times a week in dry weather; towards August a pot or two of each variety, for seed, should be placed in a frame or glass-case, to be occasionally sheltered from excessive wet and cold nights,

whereby they will ripen the seeds more effectually.

GORDONIA, Loblolly Bay.

This genus consists of shrubby evergreen exotics for the green-house, garnished with lanceolate leaves, and spikes of five-petaled flowers.

Class and order, *Polyandria Monogynia*.

Characters.] CALYX, five roundish, concave, persistent leaves. COROLLA, five large, oval, concave petals, joined to the middle of the nectarium. STAMINA, many filaments inserted in the nectarium, with oval, erect antheræ. PISTILLUM, an ovate germen, short, pentagonal style, with five acute stigmata. PERICARPIUM, an oval, acute capsule with five cells, containing two-fold seeds, with a leafy wing.

The species are,

1. **GORDONIA** (*Lasianthus*).

(*Lasianthus*)—*Smooth-leaved Loblolly Bay.*]

Hath a shrubby, branching stem, five or six feet high, garnished with stiff, spear-shaped, crenated, smooth leaves, and from the axillas of the leaves white flowers on long foot-stalks.

2. **GORDONIA** *pubescens*.

Downy Loblolly Bay.] Hath shrubby stalks branching a yard high, spear-shaped, serrated leaves, hoary underneath, and from the axillas of the stalks yellow flowers, having five styles.

3. **GORDONIA** *alatahama*.

Florida Gordonias.] Hath shrubby stems branching eight or ten feet high, garnished with oval, pointed leaves placed opposite; and the branches terminated by panicles of tubular, blue flowers, speckled with red, and with a white bractea.

These are all beautiful evergreens for ornamenting the green-house; they are propagated by layers or cuttings in the spring.

GORTERIA (*Gorteria*).

A genus of African exotics for the green-house collection, consisting of low, herbaceous, under-shrubby, and shrubby plants, one to two or three feet growth, adorned with pinnatifid and spear-shaped leaves; and terminal, compound, radiated, orange-coloured, and yellow flowers, very ornamental in summer.

Class and order, *Syngenesia Polygamia Frustranea*.

Characters.] CALYX, a compound flower, having a monophyllous, general cup, with many stiff, prickly, imbricated scales. COROLLA, a compound flower, comprising many funnel-shaped, hermaphrodite florets in the disk, and flat neutral ones in the radius. STAMINA, five short filaments, and cylindric antheræ.

theræ. PISTILLUM, a villous germen, slender style, and bifid stigma. PERICARPIUM, formed of the remaining calyx, containing many solitary round seeds crowned with down.

The principal species of note are,

GORTERIA rigens.

Rigid, or Stiff-leaved Cape Gorteria.] With low, herbaceous, under-shrubby stalks; spear-shaped, pinnatifid leaves, three or five-parted at the ends; and large, terminating, deep-orange-coloured flowers, in May and June, very beautiful.

GORTERIA fruticosa.

Shrubby Ethiopian Gorteria.] With a shrubby stem and slender branches growing three feet high; oblong-lanceolate, entire leaves, the edges indented spinous, hoary underneath; and the branches terminated by golden-yellow flowers in June.

There are some other species, but have scarcely any claim to our attention for culture in this collection, either for variety or ornament.

The two species herein described are the most noted in the English gardens, and merit estimation as ornamental flowering plants: must be kept in pots of lightish earth, and deposited among the green-house exotics, and have similar treatment in their general culture.

They are propagated by cuttings in the summer months, May, June, and July, generally under glasses; in which they will root effectually the same season.

GOSSYPIMUM, Cotton Plant.

This genus consists of some herbaceous annuals, and shrubby perennials of the stove, rising from two to five or six feet high, having divided leaves, and pentapetalous flowers, succeeded by capsules filled with seeds, wrapped up in that fine downy matter called cotton.

Class and order, *Monadelphia Polyandria.*

Characters.] CALYX is double, the outer one large and half-trifid, the inner one cup-shaped, and indented at the brim. COROLLA, five heart-shaped, plane petals. STAMINA, numerous united filaments, and kidney-shaped antheræ. PISTILLUM, a roundish germen, a columnar style, and four thick stigmas. PERICARPIUM, a roundish, acuminate capsule, of three or four cells, filled with oval seeds, and fine down, called cotton.

The plants are natives of hot countries in the Indies and America, and are cultivated in some of our hot-houses for curiosity, and for which a plant or two of a sort is sufficient.

The chief species are,

1. *GOSSYPIMUM herbaceum.*

Herbaceous Common West-India Cotton.] *Gossypium* with an herbaceous, smooth stalk, two feet high, branching upwards; five-lobed smooth leaves, and yellow flowers from the ends of the branches, succeeded by roundish capsules full of seed and cotton.

2. *GOSSYPIMUM hirsutum.*

Hairy American Cotton.] *Gossypium* with hairy stalks branching laterally two or three feet high; palmated, three and five-lobed, hairy leaves, and yellow flowers, succeeded by large oval pods, furnished with seeds and cotton.

3. *GOSSYPIMUM barbadense.*

Barbadoes Shrubby Cotton.] *Gossypium* with a shrubby stalk, branching four or five feet high, three-lobed smooth leaves, glandulous underneath; and yellow flowers, succeeded by oval pods, containing seeds and cotton.

4. *GOSSYPIMUM arboreum.*

Tree Cotton.] *Gossypium* with an upright woody perennial stalk, branching six or eight feet high; palmated, four or five-lobed, smooth leaves, and yellow flowers, succeeded by large pods filled with seeds and cotton.

The first three species are principally annual in this country, rise from seed in spring, and perish root and stalk in autumn, more especially the first and second sorts.

But the fourth sort is perennial in root and stalk.

It is these plants which produce the cotton for use; and in warm countries they are cultivated in great quantities in fields, as we do corn, particularly the annual sorts; but the first species is the most commonly cultivated.

The pods are sometimes as large as middling apples, closely filled with the cotton, surrounding the seed.

They being natives of the warm parts of the Indies, &c. so that if a plant or two of each is required here for variety, they must be raised and continued in the stove, where they will flower, and produce pods furnished with seeds and cotton.

Their propagation is by seed sown in pots of light earth in spring, plunging them in the bark-bed; and when the plants are an inch or two high, prick them in separate pots, which plunge also in the bark-bed, and retain them always in the stove.

GRAFTING, a mode of propagation, particularly used for many sorts of principal fruit-trees, being the only certain method to continue the approved varieties in their kind, and is also used for propagating many sorts of flowering shrubs and some kinds of timber trees.

This mode of propagation is the taking a graft or shoot of one tree, and inserting or ingrafting

ingrafting it into the stem or branch of another, being previously headed for this occasion; and they both uniting as one, the graft shoots forth into branches, and becomes the tree, producing flowers and fruit exactly the same as those of the tree from whence it was taken; and the grafting for all sorts being always performed in spring, in February and March, the grafts unite firmly the same season, shoot forth in summer, so as, by autumn of the same year, they will often form shoots or young branches, from about a foot, to two or three long, and in some sorts will bear fruit the second or third year.

Hence the great utility of Grafting is to propagate any approved variety of choice fruit-trees, &c. whereby they are with certainty preserved perfect in their kinds; and trees of all sorts may also be continued and multiplied by the same method of propagation: for, as just hinted, the grafts or cions, i. e. cuttings of young shoots, being taken from any particular tree or shrub, and grafted upon others of the same genus; as, for instance, a golden-reenet apple grafted upon a crab, or any other kind of apple-stock raised from seed or otherwise, the graft shoots up and becomes the tree, and bears golden renets the same in every respect as that of the tree from whence the cions were taken; so that Grafting is the principal certain method to continue any approved varieties: for although the different varieties of fruit have been all accidentally obtained from seeds, yet sow the seeds of the finest sorts, they will degenerate so greatly by seeds, that out of hundreds so raised, there probably may not be one tree which produces fruit like the original, or perhaps that possess any good quality for eating; and the same is observable in the varieties in general, so variable are seedling fruit-trees; and hence it was, that the ancients, finding there was no certainty in continuing and multiplying the approved varieties of fruit from seed, they invented the art of Grafting and inoculation, both of which proving effectual and invariable, and the trees also sooner arriving to a bearing state, are still continued in the propagation of almost all the varieties of our principal fruit-trees; for whatever be the stock or tree, on which you perform the Grafting, if of the same genus, the graft will grow freely, and always remain unalterably the same; that is, always producing the same sort of fruit as its parent tree, which renders Grafting of general utility in gardening, but more particularly for fruit-trees; though some sorts, as vines, figs, quinces, mulberries, currants, gooseberries, &c. are most commonly propagated by layers and

cuttings of their branches, and some by suckers, all of which striking root freely in the ground, shoot up into stem and branches, and, like the grafts, produce fruit also exactly the same as the tree from whence they were taken. But as most other sorts of fruit-trees succeed much better by Grafting and budding, that method is commonly practised in their propagation; many curious varieties of ornamental trees and shrubs may also be propagated with certainty of continuing them the same, by Grafting and budding, particularly all the striped and variegated-leaved varieties, as also all other varieties of any particular species.

By Grafting also, different sorts of fruit and flowers of the same genus may be made to grow upon one tree; as for instance, grafts of several sorts of apples may be ingrafted into the same tree; each graft branching out, produces fruit in every respect like that of the tree from whence they were cut; by the same rule you may also, for curiosity, have several sorts of pears on one tree, also apples and pears on the same tree or branch, as being all of the same fraternity or genus; the same is also observable of all other trees of the same genus or family; this, however, of Grafting different sorts upon the same tree, is only mentioned to explain what might be done if occasionally required, by way of curiosity, or variety; as in the general practice one sort only on each tree is commonly adopted; and in all cases having the stocks and grafts principally of the same genus to insure the desirable success: for it is in but very few instances that trees of a different genus will grow successfully upon each other by Grafting or budding, though the almond, peach, and nectarine, being all of the genus *Amygdalus*, will grow upon the *Prunus* or plum-tree, and which is the common stock on which these kinds are usually worked: but, these excepted, all other kind of fruits succeed best upon stocks or trees of their own family.

Of the proper Stocks, &c. to graft upon.

With respect to the stocks, or trees, on which to perform the operation of Grafting, it is most commonly performed upon the stems of young trees, raised from the seed, suckers, layers, or cuttings for that purpose; though they are the most commonly raised from seed, except in particular cases; and when designed for the purpose of Grafting upon, are always denominated stocks, which, when from about the size of a large goose quill, to an inch or more in diameter, are of due size for receiving the grafts; observing, that, previous to the insertion of the grafts, the head of each stock must be cut off, from within about six inches to

to as many feet of the ground, according whether the tree is designed for a dwarf, or a half, or full standard; and one graft is commonly inserted into each stock, though in large stocks sometimes two or more grafts are inserted; remarking, that if intended to raise dwarf-trees, the stock, at the time of Grafting, must always be headed down within a few inches of the ground, for the insertion of the graft; and for standards, the heading of the stock for the insertion of the graft may either be near the ground, the graft inserted accordingly, and one of the first shoots from the graft trained up to form a stem; or if you design the stock to form the stem, as is common for standard cherries, &c. it must be suffered to grow six or seven feet high, so head it at four, five, or six feet height, for the reception of the grafts.

But Grafting is also performed occasionally upon old trees, or such as already bear fruit, particularly when it is designed to change the sorts, or have more than one sort on the same tree, or to renew the whole, or any particular branch of a tree; in either case, inserting the grafts into the most upright branches; sometimes heading the branches down for their reception, and sometimes inserting the grafts into their sides without heading down. But as there are five or six different methods of Grafting, each method is fully explained in its proper place under this general head.

The particular sorts of stocks, proper for Grafting each sort upon, are intimated in the following directions in the operation of Grafting, and are more fully exhibited under each respective article as they occur in the course of the general work, in the different parts of the book.

Let it however be remarked, both in Grafting and inoculation, that, as above noticed, the different varieties of each genus, whether fruit-trees, forest-trees, shrubs, &c. must always be grafted upon stocks or trees of the same family, or such that are very near kindred by the *characters* of their flower; otherwise they will not succeed; as for example, apples should be grafted only upon apple-stocks, i. e. young trees raised from the kernels of any kind of apple whatsoever: they will however also grow upon pear and quince stocks, as being all of the same genus; but they always succeed best upon any kind of apple-stocks, raised either from the kernels of the wild crab, or those of any of the cultivated apples. Pears likewise succeed best upon pear-stocks, or, to have them dwarfs, are grafted upon quince-stocks. Plums should be grafted principally upon plum-stocks, though they will grow upon those of cherries, and

cherries upon these, they being all of the same family; but each succeed considerably best upon their own stocks. Cherries should therefore likewise be grafted upon cherry-stocks: but for particulars of each kind, see the several articles under their respective genera.

As to the method of raising the different sorts of stocks for Grafting, it is most commonly by seed, kernels, or stones of the respective fruits, sown in autumn or spring, in beds of good earth, covering them with mould about an inch or two deep, according to their sorts or sizes; they will come up in the spring or early in summer, and having obtained one or two years' growth, will be fit to plant in nursery rows, in winter and spring following; and in the spring after, many of them will be fit to whip-graft; but when they are from two to five or six years old, they will be suitable for one or other of the several methods of Grafting.

Stocks are also sometimes raised by layers and cuttings of the young shoots of particular trees of each respective genus, when designed to have stocks for Grafting particular varieties of fruit upon, as explained under their proper articles.

Stocks are likewise raised from suckers arising from the roots of the trees of the respective sorts, transplanting them into the nursery in autumn; to remain one, two, or three years, or more, as may be required, ready for Grafting.

But the particular stocks, and method of raising them, is fully exhibited under the respective genera, which see; also the articles NURSERY and STOCKS.

Of the proper Grafts.

The grafts or cions, with which the Grafting is effected, are young shoots of the last summer's growth, for they must not be more than one year, and such that grow on the outside branches, and robust but moderate shooters; such also that are firm and well ripened, should always be chosen from healthy trees, observing, that the middle-part of each shoot is always the best graft; though good shoots may be divided into two or more, cut, at the time of Grafting, to five or six inches in length, or so as to have four or five good eyes or buds; but should preserve them at full length till Grafting time, then prepared as hereafter directed.

They should be collected or cut from the trees in February, in mild weather, before their buds begin to swell, or advance much for shooting; in collecting them, chuse such as have not made any lateral or side shoots; cut them off at full length; and if they are

not to be used as soon as they are collected, lay their lower ends in some dry earth in a warm border till Grafting time; and if severe weather should happen, cover them with dry litter.

Necessary Materials used in Grafting.

The proper tools, and other materials used in Grafting, are,

A strong knife for cutting off the heads of the stocks, previous to the insertion of the graft, also a small hand-saw for occasional use in cutting off the heads of some particular large stocks two or three inches thick, or more, as sometimes occur in crown-Grafting.

A common Grafting-knife, or strong, sharp pen-knife, for cutting and shaping the grafts ready for insertion; also to slope and form the stocks for the reception of the grafts.

A flat Grafting chisel or strong knife, and a small mallet, for clefting large stocks, in cleft-grafting, for the reception of the graft.

A quantity of new bass-strings for bandages, for tying the grafted parts close, to secure the grafts, and promote their speedy union with the stock.

And, a quantity of Grafting-clay, for clay-ing closely round the grafts after their insertion and binding, to defend the parts from being dried by the sun and winds, or too much liquefied by wet, or pinched by cold; for these parts ought to be closely surrounded with a coat of clay in such a manner as effectually to guard them from all weathers, which would prove injurious to young grafts, and destroy their cementing property, so as to prevent the junction; therefore, a kind of stiff loamy mortar must be prepared of strong fat loam, or, in default thereof, any sort of tough binding clay, either of which should be laid in an heap, adding thereto about a fourth of fresh horse-dung free from litter, and a portion of cut hay, mixing the whole well together, and add a little water, then let the whole be well beaten with a stick upon a floor, or other hard substance; and as it becomes too dry, apply more water, at every beating turning it over; always continue beating it well at top till it becomes flat; which must be repeated more or less according to the nature of the clay, but should be several times beaten the first day; and next morning repeat the beating, still moistening it with water, and by thus repeating the beating several times every day for two or three days, or every other day at least, for a week, it will be in proper order for use; observing it should be prepared a week at least before it is used; but if a month, the better, keeping it moist.

Time and Method of Performing the Work of Grafting.

The season for performing the operation of

Grafting is February and March, though, when the work is performed in February, it for the general part proves the most successful, more especially for the earlier-shooting kinds, as cherries, plums, and pears; and March Grafting is well adapted for apples, which generally are later shooters than the above-mentioned.

There are different methods of Grafting in practice, termed, Whip-grafting—Cleft-grafting—Crown-grafting—Cheek-grafting—Side-grafting—Root-grafting—and Grafting by approach or inarching; but Whip-grafting and Cleft-grafting is most commonly used, and Whip-grafting most of all, as being the most expeditious and successful of any.

Whip-grafting.—This being the most generally successful and expeditious method of all Grafting, and admitting of being performed on younger or smaller stocks than any other mode, is the most commonly practised in the nurseries, and is always performed upon small or moderate-sized stocks, from about the size of a large goose quill to half an inch, or a little more or less in diameter; or is eligible when the stock and graft nearly approach in size; though in general the stock should be larger than the graft, in the above proportion: and is called Whip-grafting, as may be supposed, from the method of cutting the stock and grafts sloping on one side, so as to fit each other, and thus tied together in the manner of a whip-thong to the shaft or handle; and the method is as follows.

Having the cions or grafts, knife, bandages, and clay ready, then begin the work by cutting off the head of the stock at some clear smooth part thereof; generally performing this by one clean sloping cut upward, so as to form one side a little sloping about an inch and half, or near two inches in length, and make a notch or small slit near the upper part of the slope downward about half an inch long, to receive the tongue of the cion; then prepare the cion, cutting it to five or six inches in length, forming the lower end, on one side, also in a sloping manner, the length of, and to fit the sloped part of the stock, as if cut from the same place, that the rinds of both may join as nearly as possible in every part; and make a slit upwards in the upper part, so as to form a sort of tongue to fit the slit made in the slope of the stock; then place the graft, inserting the tongue of it into the slit of the stock, applying the parts as evenly and close as possible; and immediately tie the parts closely together with a string of bass, bringing it in a neat manner several times round the stock and graft, moderately tight, and fastened accordingly; then clay the whole over near an inch thick on every side, from about half an inch or

or more below the bottom of the graft, to an inch over the top of the stock, finishing the whole coat of clay in a kind of oval-globular form, rather longways up and down, closing it effectually about the cion, and every part, so as no sun, wind, nor wet may penetrate; to prevent which, is the whole intention of claying; observing to examine it now and then, to see if it any-where cracks or falls off, and if it does, it must be instantly repaired with fresh clay.

The nursery grafters generally perform the Whip-grafting very expeditiously, in four cuts, two in heading, sloping and slitting the stock, and the same in preparing the graft, inserting it directly; one or two persons following after to tie and clay them.

This sort of Grafting may also be performed, if necessary, upon strong young shoots of any bearing tree, if intended to alter the sorts of fruits, or have more than one sort on the same tree.

By the middle or latter end of May, or in June, the grafts will be well united with the stock, as will be evident by the shooting of the graft; then the clay may be wholly taken away, but suffer the bafs bandage to remain some time longer, until the united parts seem to swell, and be too much confined by the ligatures; then take the tying wholly off.

Their further culture is directed under the respective articles, whether designed for dwarfs or standards, &c.

Cleft-grafting.—This is called Cleft-grafting, because the stock being too large for Whip-grafting, is cleft or slit down the middle for the reception of the graft; and is performed upon stocks from about one to two inches diameter.

First, with a strong knife cut off the head of the stock; or if the stock is very large, it may be headed with a small saw; and in either method, cut one side sloping upwards about an inch and half to the top; then proceed, with a strong knife or chissel, to cleave the stock at top, cross-way the slope, fixing the knife or chissel towards the back of the slope, and with your mallet strike it, so as to cleave the stock about two inches, or long enough to admit the graft, keeping it open with the chissel, or a wedge; this done, prepare the cion, cutting it to such length as to leave four or five eyes, the lower part of which being sloped on two sides, opposite, wedge-fashion, an inch and half or two inches long, making one side to a thin edge, the other much thicker, leaving the rind thereon, which side must be placed outward in the stock; the cion being thus formed, and the cleft in the stock being made and kept open with the chissel, &c. place the graft therein at

the back of the stock, the thickest side outward, placing the whole cut part down into the cleft of the stock, making the rind of the stock and graft join exactly; then removing the chissel or wedge from the cleft, each side will closely squeeze the graft, so as to hold it fast; it is then to be bound with a ligature of bafs, and clayed over, as observed in Whip-grafting, leaving three or four eyes of the cions uncovered.

If intended to graft any pretty large stocks or branches by this method, two or more grafts may be inserted in each; in this case you may proceed, either by preparing and forming the stock, as above, so cleave it across in two places parallel, a small distance apart, and insert a graft in each cleft: or by cutting or sawing the head off horizontal, smoothing the top, cleave one side downward, a proper length, inserting a graft therein; then cleaving the other side, insert a graft in a similar manner; or also a large stock being headed level, may cleave it similarly as above, in three or more places round the outside, at some regular distance asunder, so insert a graft in each cleft, the same as the other; and, in all of which, tie and clay the grafts, as in the foregoing methods.

This method of Grafting may be performed occasionally upon the upright branches of bearing trees, when intended either to renew the wood, or change the sort of fruit.

Towards the latter end of May, or the beginning of June, the junction of the graft and stock, in either of the above methods of Cleft-grafting, will be effectually formed, and the graft begin to shoot; when the clay may be taken off, and in a fortnight or three weeks after, take off also the bandages.

Crown-grafting.—This kind of grafting is commonly practised upon such stocks as are too large to cleave, and is often performed upon the large branches of apple and pear-trees, &c. that already bear fruit, when it is intended to change the sorts, or renew the tree with fresh-bearing wood, and is termed Crown-grafting, because the stock or branch being headed down horizontal, several grafts are inserted circularly at top betwixt the wood and bark, in an upright manner all round the crown: but this kind of Grafting should not be performed until March, or early in April; for then the sap being in motion, renders the bark and wood of the stock much easier to be separated for the admission of the grafts.

The manner of performing this method of Grafting is as follows:

First cut off the head of the stock or branch with a saw horizontally or level, and pare the top smooth; then having the grafts, cut one side of each flat, and somewhat sloping, an inch

and half long, forming a sort of shoulder at top of the slope to rest upon the crown of the stock; and then raising the rind of the stock with a wedge, so as to admit the cion between that and the wood two inches down; which done, place the grafts with the cut side next the wood, thrusting it down far enough for the shoulder to rest upon the top of the stock; and in this manner may be put three, four, five, or more grafts in one large stock or branch.

When the grafts are all thus inserted, let the whole be tied tight and well clayed, observing to leave two or three eyes of each graft uncovered, but raising the clay an inch above the top of the stock, so as to throw the falling wet quickly off, without lodging about the grafted parts, which would ruin the whole work.

Crown-grafting may also be performed, by making several outward clefts in the crown of the stock, and inserting the grafts round the top into the clefts.

The grafts will be pretty well united with the stock, and exhibit a state of growth by the end of May, or beginning of June, and the clay may then be taken away.

The trees grafted by this method will succeed extremely well, but, for the first two or three years, have this inconvenience attending them, of being liable to be blown out of the stock by violent winds, which must be remedied by tying long sticks to the body of the stock or branch, and each graft tied up to one of the sticks.

Cheek-grafting.—Cut the head of the stock off horizontally, and pare the top smooth, then cut one side a little sloping, an inch and half or two inches, and cut the lower part of the graft sloping the same length, making a sort of shoulder at top of the sloped part; it is then to be placed upon the sloped part of the stock, resting the shoulder upon the crown of it; bind it with bafs, and finish with a covering of clay as in the other methods.

Side-grafting.—This is done by inserting grafts into the sides of the branches without heading them down, and may be practised upon trees to fill up any vacancy, or may do it for variety, to have several sorts of apples, pears, plums, &c. upon the same tree.

It is performed thus: fix upon such parts of the branches where wood is wanting to furnish the head, or any part of the tree; there slope off the bark and a little of the wood, and cut the lower end of the grafts to fit the part as near as possible, then join them to the branch, and tie them with bafs, and clay them over.

Root-grafting.—This is done by Whip-

grafting cions upon pieces of the root, turned up, about half an inch thick, of any tree of the same genus, either as the root remains, or separated, and immediately replanted.

Grafting by Approach or Inarching.—This sort of grafting is, that when the stocks designed to be grafted, and the tree from which you intend to take the grafts, either grow so near, or can be placed so near together, that the branch or graft may be made to approach the stock, without separating it from the tree, till after its union or junction with the stock; so that the branch or graft being bent to approach the stock, they together forming a sort of arch, it is called Grafting by Approach, or Inarching, and as being a sure method, is commonly practised upon such trees as are with difficulty made to succeed by any of the former ways of Grafting, or other methods of propagation.

When intended to propagate any kind of tree or shrub by this method of Grafting, if the tree, &c. is of the hardy kind, and growing in the full ground, the requisite quantity of young plants for stocks must be set round it, or in pots placed in the same manner, and when grown of a proper size and height, the work of inarching must be performed; or if the branches of the tree you design to graft from are too high for the stocks, in that case stocks must be planted in pots, and a slight temporary stage must be erected around the tree, of due height to reach the branches, and the pots containing the stocks must be placed upon the stage.

As to the method of performing the work, observe, that in this method of Grafting, it is sometimes performed with the head of the stock cut off, and sometimes with the head left on till the graft is united with the stock, though by previously heading the stock, the work is much easier performed; and having no top, its whole effort will be directed to the nourishment of the graft; having however the stocks properly placed, either planted in the ground, or in pots, around the tree to be propagated, then make one of the most convenient branches approach the stock, and mark on the body of the branch the part where it will most easily join to the stock; and in that part of each branch pare away the bark and part of the wood two or three inches in length, and in the same manner pare the stock in the proper place for the junction of the graft, then make a slit upward in that part of the branch, so as to form a sort of tongue, and make a slit downward in the stock to admit it; let the parts be then joined, slipping the tongue of the graft into the slit of the stock, making the whole join in an exact manner, and tie them

them closely together with bafs, and afterwards cover the whole with a due quantity of Grafting clay, as before directed in the other methods.

After this, let a stout stake be fixed properly, for the fupport of each graft, to which let that part of the ftock and graft be faftened, which is neceffary to prevent their being difjoined by the wind.

The operation being performed in fpring, let them remain in that pofition about four months, when they will be united, and the graft may then be feparated from the mother-tree; in doing this, be careful to perform it with a fteady hand, fo as not to loofen or break out the graft, flicing it off downwards clofe to the ftock; and if the head of the ftock was not cut down at the time of Grafting, it muft now be done clofe to the graft; and all the old clay and bandage muft alfo be cleared away, and replaced with new, to remain a few weeks longer.

Obferve however, that if you fhall think the grafts are not firmly united with the ftock in the period of time above-mentioned, let them remain another year till autumn, before you feparate the grafts from the parent tree.

By this kind of Grafting, you may raife almoft any kind of tree or fhrub; which is often done by way of curiofity, to ingraft a fruit-bearing branch of a fruit-tree upon any common ftock of the fame fraternity or genus, whereby a new tree, bearing fruit, is raifed in a few months; this is fometimes praftifed upon orange and lemon-trees, &c. by Grafting bearing-branches upon ftocks raifed from the kernels of any of the fame kind of fruit to a proper fize; or is occasionally performed upon the fame trees, by inarching into the branches of each other, fo as to have oranges, lemons, and citrons all on the fame tree.

GRASS, Grafs Lawns, &c. for ornament to pleafure-gardens.

In modern gardening, a fpacious Grafs lawn extended in the front of the main habitation is the prevailing tafte, which, by its conftant verdure, fummer and winter, and open rural extenfion, exhibits a fine imitation of nature at all feafons, efpecially when each fide-boundary terminates in rural plantations in various imitative natural bendings in concave and convex curves, to take off all appearance of formality. Rural Grafs openings are alfo continued between the plantations throughout the different diftricts of the pleafure-ground, feparating and bounding the fhrubbery clumps, &c. in fome places widely fpread, in others more contracted; in either cafe, extended to the boundaries of the feveral plantation compartments, in various bendings, fweeps and curves; which renders the whole rurally or-

namental; and is more agreeable and eafy to walk on than gravel between the plantations in dry hot weather in fummer.

Straight Grafs walks prevailed greatly in the ancient ftyle of gardening, both for ornament and common walking; but thofe for ornament, unlefs they are elegantly wide and fpacious, have a littlenefs in their general appearance, as is obfervable where long narrow frips of Grafs are extended to a great length, by way of walks; and with regard to having Grafs walks for common walking, they are very improper in winter, and all moift weather; alfo even in fummer in mornings and evenings, as being then always damp and dewy, which renders them very uncomfortable, as well as unfafe to fome, with refpect to health, to walk on them; fo that ftraight Grafs-walks of the above defcription fhould be but fparingly introduced for common walking: or where any may be occasionally intended for variety, ornament, or fummer's walking, they fhould be as fpacious as the fituation admits, not lefs than ten to fifteen feet wide, or even twenty feet wide or more, when the walk is confiderably extended in length.

The method of forming or making Grafs-work in gardens, is either by fowing it with Grafs-feed, or by laying it with turf, cut from a fine common or down, the latter of which, where it can be obtained at a moderate expenfe, is greatly preferable; it not only at once forms a complete fward, but is generally more clofe, even, and fmooth, not apt to run up to benty Grafs, or grow rank, or rife in tufts.

In preparing the ground either for fowing grafs feeds or laying with turf, the whole muft be broken up equally a moderate fpade deep, clearing out all roots of perennial weeds; and then having ftakes or wooden pegs, levelled in by notches, for your mark of level, agreeable to the laws of proportion, and the pofition of the ground, proceed with line and fpade, to rough-level it, according to the faid mark or level on the pegs, and then tread or ram the whole down equally, that it may nowhere fink in hollows hereafter; this done, work off your levels more accurately, and finifh the whole with a neat raking, clearing off all large ftones, making an even and fmooth furface; and it is then ready, either for fowing with feed, or to be laid with turf.

As it may in fome places be the moft convenient to fow the ground with Grafs-feed, and in others, to lay it with turf, we will exhibit both methods feparately.

By Seed.

By fowing with feed.—If intended to fow the ground with Grafs-feed, as may be the cafe for large fpaces of ground, or where turf cannot,

cannot be conveniently obtained, the season for sowing it is February, March, and April, and will come up fine and green in a month or six weeks; and if sown in August or September, in moist weather, it will also rise very fast and thick before winter. The chief article is to procure good seeds; those from under a common hay-stack, or out of a haystack, are often used, which may do very well, provided the hay was the growth of some fine pasture free from weeds, and affords naturally fine turf when grazed and mowed; but without attending to these particulars, there are often a mixture of various sorts, weeds and all, whereby the sward will be very irregular and foul, and never make handsome Grass. If you are not furnished with seeds of your own, they may be obtained cheap enough of the seedsmen; they must be sown by broadcast, very thick and regular, and directly raked in; and, when the surface is dry, roll the ground with a wooden roller, which will bury the seed more effectually, and make a smooth surface; when the Grass comes up, pull up all weeds; and, the same season, when the sward is become thick and green, and advanced some inches, it should be mowed, and after this roll it well, and so continue mowing it, &c. two or three times the first summer, especially if it was sown in spring; and the oftener it is mowed and rolled, the thicker and finer it will grow; observing, if intended to keep the Grass tolerably fine, mowing will be requisite once a week or fortnight according to its growth, from April until October, and should be rolled once a week or fortnight, generally in moderately dry weather; and occasionally in winter.

By Turf.

Laying the ground with turf, where turf can be easily procured, should always be greatly preferred to seed for Garden-grass, for the reasons before-mentioned; and the best turf for that purpose is that of a fine pastured common or down, where the sward is fine and the Grass short.

The season for laying turf is any time from September till April or May, though it will grow at almost any time of the year, even if there is occasion to lay it in summer, and dry weather succeed; for although it will divide or open wide at the joints, and turn brown as if dead, yet after the first rain it will close again, and resume its verdure.

The turf for this use is cut or flead with an iron instrument called a turfing-iron; observing to cut them all an equal width, length, and thickness; the proper size is a foot wide, yard long, and about an inch thick; they should be first marked by line, the proper

width, length, and depth, with a racer or cutter (see RACER). Racing them first long ways a foot wide, then across in yard lengths, then proceed to cut them up, having particular regard to cut them level, all an equal thickness, otherwise it will be impossible to lay them level; as you cut, a man or boy should roll each turf up close and tight, the Grass side inwards, and pile them up by tens, especially if they are cut by the hundred.

If they are cut by the hundred, the price is from six-pence to a shilling, according to the nature of the soil, whether soft and easy to cut, or hard or stony; and a man will cut from three to five, six, or seven hundred in a day, or more, if very soft easy cutting turf, having a person to race them out, and roll them up, turf and turf, as they are cut, out of the way of the cutter.

As to the method of laying them, it is very easy; they are to be laid regular, turf and turf, unrolling them as you lay them, joining them up quite close edge to edge, making good all deficiency of broken parts as you go on; and as soon as laid, it should be well beaten with broad heavy wooden beaters, being flat pieces of elm or oak plank, two inches thick, fifteen or eighteen inches long, and a foot broad, having a long handle fixed slanting in the middle of the upper side; and with these beat the grass regularly all over, and then roll it well with a heavy iron or stone roller, and the work is finished; observing, the beating and rolling should be repeated in moist weather.

If very dry hot weather succeeds, so as to occasion the turf to shrink and open at the joints, a good watering will be of much advantage; do not, however, be under much anxiety about this; for, as before hinted, the first rain will swell and join all close, and recover the verdure of the Grass effectually.

Its general Management throughout the Year.

The culture necessary for garden Grass is frequent mowing in summer, to keep it short and fine like a pastured down; poling occasionally with a long pole, to scatter the worm-casts, which so greatly deface all grass; frequent rollings both to take up the scattered worm-casts to make the surface clean, and to render it smooth and firm.

As to mowing; to keep Grass in gardens very neat, mowing it once a week, ten days, or fortnight, or according to its general growth, during the summer, is necessary, especially for the principal home lawns, and other Grass-ground in the most conspicuous parts of the garden, which parts should always be kept very close and fine, like the sward of a fine pastured down or common:

mon: the mowing of garden Grass is performed with a short Grass scythe; and dewy mornings, or moist weather, must always be chosen for that work, for it will be impossible to mow short Grass properly in dry weather. But previous to mowing, it is of advantage sometimes to pole and roll the Grass the day before you intend to mow; in performing the mowing, proper attention is necessary not to score, i. e. leave the mark of each stroke of the scythe, which has a very unsightly appearance; to prevent which, as much as possible, have the point of your scythe laid out rather wide, an inch or two beyond the measure of heel and point, especially for very short Grass; and in mowing, keep the point rather out, and do not draw that part too fast inward, gathering your Grass neatly to the left in a range, and having mowed to the end of the swarth, mow it lightly back again, to trim off all scores, and other irregularities, unavoidably left the first time.

As soon as you have done mowing, proceed to sweep up the mowing, each swarth regularly, by standing in the middle, sweeping it along alternately to the right and left to the end of the swarth, forming all the Grass thereof in a range on each side, then sweep up the ranges in large heaps, and carry the whole off directly in a wheel-barrow or large basket.

Poling the Grass.—This is performed with a long taper pliable ashen pole, fifteen or eighteen feet long, to break and scatter the worm-casts about, i. e. those little lumps of earth cast up by the worms all over the surface of the Grass, and greatly deface it; but by using the pole, when they are moderately dry, sweeping it backward and forward upon the Grass, breaks the earthy lumps into small particles, and scatters them about, and if the Grass is afterwards rolled with a wooden roller when the surface is a little moist, but not too wet, the earth will all adhere to the roller, and render the surface perfectly clean; observing this work should be repeated, as you shall see occasion, the year round; and in mowing time, if the surface is foul, it is particularly necessary to pole and roll on the day previous to mowing, whereby, having a clean smooth surface, you will be able to mow close, even, and more expeditiously.

Rolling garden Grass is performed occasionally with a wooden roller, and a heavy iron or stone roller: a wooden roller is proper occasionally after poling, to clean up the worm-casts and smooth the surface, observing this work should never be performed when the surface is very wet, especially if full of worm-casts, as it would plaster and daub the grass

very much, and render it unsightly; a heavy iron or stone roller should be used occasionally, when the surface is dry, to press down all inequalities close, so as to preserve a firm, even, smooth surface. And in fine-kept grass, the rolling performed occasionally a day or two before mowing, to settle the surface firm and smooth, greatly contributes to the easy and exact performance of that work; the work of rolling is, in small or but moderately large gardens, always performed by men; but in very extensive grounds, it is sometimes done by horse, having a large roller for that purpose, with shafts like a cart, &c. and the horse should at that time wear a sort of leather shoes, very broad at bottom, made to lace on occasionally like men's half-boots, to prevent his feet cutting the surface in holes.

In some places the Grass is greatly defaced in May and June by the vast quantities of wild daisies daily arising, to remedy which, as much as possible, may have the blade of an old broad sword fixed in the end of a long pliable pole, and as this kind of sword cuts both ways, by sweeping it backwards and forwards, it will head down the daisies at a great pace, which may be repeated two or three times a week, or as often as there may be occasion.

In the finishing autumn mowings, in September or October, &c. should generally cut down as close and even as possible, that the sward may remain in a neat even surface all winter.

The above general directions in the management of the garden-grass compartments regard only such as are required to be kept always short, to a close even surface, as is generally necessary in the principal lawns, plats, walks, and other divisions, commonly situated within the limits of the main garden or pleasure-ground; but in outward, considerably extended districts of capacious lawns continued into parks, &c. it is not necessary; or probably, two, three, or four common mowings in a summer may be sufficient, with some occasional rollings after mowing.

GRAVEL. Gravel-walks are great ornaments to gardens, as well as the most useful kinds of walks for common walking.

The best Gravel for walks is that which is composed naturally of irregular pebbles and flints, having a moderate proportion of a yellowish or brownish sandy loam, to make it bind, and give colour; which kind of Gravel is the most common and valuable of all for walks, and is obtained in fields and commons in many parts of England, at about from one to three or four feet under the surface, though not equally good in all parts in respect to quality.

quality and colour; some may have a greater or lesser quantity of pebbles, a larger or smaller quantity of loam, the loam more or less sandy or clayey; and as to colour, it is the colour of the loam principally which constitutes the beauty of Gravel-walks; and that of a deepish yellow or reddish colour is the most eligible, as when formed into walks well laid and rolled, is exceedingly beautiful and ornamental, and where such Gravel can be procured within a moderate distance, and easy expense, is preferable to all other; but in some parts, the Gravel is of an iron-mould colour, or of a dusky-brown hue, which may nevertheless be of a proper quality for walks, provided the colour can be dispensed with, and as the most esteemed high-coloured Gravel is not to be met with every where, we must be content with such as nature affords.

It must however be remarked, that, of whatever colour the Gravel, its proper quality for walks is, such as has a due proportion of moderate, light, sandy loam, to make it bind close and firm at all seasons, but not so redundant in loam, nor so clayey, as to be clammy and stick to the feet in wet weather, nor too sharp and sandy, to become open and loose in dry weather.

In some places, however, there is no other gravel but such as is very loose, sandy, or pebbly, having scarcely any binding materials amongst it; which kind of gravel will never of itself bind, but always remain open and loose, and be at all times disagreeable to walk on: this, therefore, should be mended with a mixture of light, sandy loam, where practicable, adding about one load to every two or three of gravel, casting them together, and turning them over two or three times, that they may be well blended and incorporated; and this, when formed into a walk, will bind close, firm, and smooth at all seasons.

In preparing the gravel for your walks, it should by no means be fine screened, as is often the practice; only as it is dug out of the pit, cast it up in a heap, or long ridge, and all such large rough pebbles only, as roll down, should be cleared away; for if screened from the stones, it will partake too much of the loam, so as always to stick to the feet at every flash of rain; but by raking out just only the large rough stones, it will be sufficiently fine, and the walk formed of such will always be fit for use.

Gravel for walks, if it is to be purchased, is from about two to five or six shillings per cart-load for three horses; though the price is different in different parts, and according to the nature of the Gravel; but about London, if they cart it home from the pits, it is com-

monly five or six shillings per load, or more, according to the distance; and sometimes they carry a load and half at once, in the same cart, which is charged accordingly.

As to the distribution of Gravel walks in gardens, both for ornament and use, a magnificent walk of Gravel is necessary to proceed immediately parallel with the house, proportionable to its grandeur, extending each way towards the side districts of the garden; and according to the former style of gardening, a large grand Gravel walk was usually extended in a straight line from the front of the habitation, along the middle of the pleasure ground, sometimes having grass plats continued on each side, and sometimes spacious borders furnished with curious shrubs and flowers. But in modern designs the above middle walk is rarely admitted, especially in spacious gardens, having nothing in front beyond the parallel habitation-walk, but an open rural grass lawn, free from all interfections of walks, &c. however, a grand walk closely parallel to the house, as observed above, is indispensably necessary, both for ornament and use; and from this, side walks should branch off, communicating with the other parts of the garden, one in particular to be extended in a serpentine order quite round the ground, others leading in the same manner through the interior parts, so as to have dry firm walking at all times to every part of the garden without walking upon the grass, which sometimes may be wet and disagreeable.

As to the dimensions for Gravel walks, they are to be regulated according to the extent of the garden, so may be from five to twenty feet or more wide, the length indeterminate; but all principal walks should be at least ten feet wide; and in large gardens, that leading directly from the house should be fifteen or twenty feet wide at least; though, where the house and gardens are magnificent, the main walks contiguous to the mansion are sometimes made thirty or forty feet wide; the boundaries on each side is sometimes of grass widely extended, and sometimes are bounded by borders for flowers and other curious plants, having either narrow verges of grass, or edgings of dwarf-box, or thurst, &c. next the walk.

According, therefore, to the above rules, stake out the width of the walk, and proceed to form the boundary, each side of equal level, corresponding to the adjacent ground, and form the cavity of the walk for the reception of the Gravel; observing that the whole space must be digged ten or twelve inches deep, to allow for a proper depth of gravel, both to prevent weeds rising from the ground below, and worms from casting up the earth therefrom;

from ; as also to allow of a proper depth for turning the gravel occasionally when the surface becomes foul : the earth digged out to form the cavity of the walk, may be used to raise and form the ground on each side, if necessary, which, and the edgings, should always be completed before you begin to lay the Gravel.

Every thing being ready for the reception of the Gravel, then you may in the first place lay any hard rubbishy materials in the bottom, several inches thick ; such as any coarse gravel or ballast, or any rough, stony, or other rubbish, which can be best procured, which will greatly prevent worm-casts, and help to drain the moisture from the top of the walk in wet weather, and in winter, to preserve a dry surface : the proper gravel is then to be laid six or eight inches thick ; as you proceed in laying, observe to raise the middle higher than the sides, in a gradual rounding form, which is not only necessary to throw off the wet, but also to give the walk a more ornamental appearance ; the proportion to be observed in this is, that for a walk of five or six feet width, an inch and an half rise in the middle may be sufficient ; one of ten or twelve feet, two and a half ; and one of twenty feet, three, to four or five inches rise will be enough ; observing nearly the same proportion in any width whatsoever, and by no means raise the middle much higher, which would render the walk both uneasy to walk upon, and of disagreeable appearance ; being particularly attentive to form the rise all the way gradually rounding from both sides to the middle, laying every part very exact and even ; and at every ten or fifteen feet as you advance in laying the gravel, it is proper to tread, rake, and roll it, for gravel always rolls more firm and smooth whilst it is fresh stirred ; besides, it is necessary for fear of rain happening, especially in loamy gravel ; for which reasons also, you should never lay more in one day than you can finish off, except to rough lay it ; the treading should therefore be performed regularly with the feet pretty close, taking short steps ; which work being necessary to render every part equally firm, and so as not to sink in holes under the feet, in the work of raking and rolling ; the raking should be performed regularly lengthways the walk ; and in the finishing off or smooth-raking, a wooden-headed rake, without teeth, would be most eligible ; or, in default thereof, may use the back of any common rake occasionally ; as, by either of which, you will be able to smooth the surface more regularly, even without drawing off the requisite proportion of top pebbles, or raking them into holes or heaps ; for the art of smooth-raking is to leave

all the proper-sized top stones equally dispersed over the surface. As soon as any part is thus laid and raked, let it be well rolled, both across and lengthways ; and when the whole is laid, give a good rolling the whole length, repeating it till the surface is rendered perfectly compact, firm, and smooth ; and if after the first shower of rain, you give it another good rolling, it will bind like a rock.

The management of Gravel walks, to keep them perfectly neat the year round, is occasional weeding, sweeping, and good rolling once or twice a week, especially in the advanced part of spring, and all summer ; and also occasionally in winter, in dry open weather ; and when the surface becomes very foul, or overrun with small weeds or moss, as is often the case, the walks must be broken up in spring, and turned, the surface to the bottom, and the bottom to the top, whereby the weeds and moss will not only be buried, but by turning up the fresh gravel, the walk will appear as fresh as when new laid. But the custom of breaking up gravel walks in the beginning of winter, in rough ridges, to remain in that useless and unsightly manner all that season, with some view to destroy weeds and moss, which, however, does not always answer the intention so effectually as a regular spring turning, and is not eligible for general practice, or only occasionally where any walk is exceedingly over-run ; for by a general breaking up of the gravel as above, the walks are thereby not only rendered useless for almost one half of the year, but at a time when there is hardly any dry or sound walking upon grass or other parts : besides these inconveniences, the walks appear not only unsightly in themselves, but give also a very disagreeable look to the adjacent parts of the garden : it would therefore be most advisable to permit all the principal gravel walks to remain undisturbed, at least till the spring, when, if it shall appear necessary, the whole may be broken up, regularly turned, and re-laid in a neat manner, to remain clean, of a fresh lively colour, all summer.

Rolling should be performed once a week at least, in summer, but if two or three times, the more beautiful the walks will appear, and tend greatly to destroy weeds and moss ; it is, however, a general rule among gardeners, to sweep and roll every Saturday ; and during summer it is of much advantage to give a good rolling after rain, which will preserve a compact smooth surface.

Turning gravel is a sort of slight digging, turning the foul surface down and the fresh up ; which being necessary, as above observed, when the surface is become foul or discoloured, or

full of small weeds, or very mossy, and which is the only effectual method of destroying them; besides, the work of turning is necessary once every year or two in spring, to turn up the fresh gravel to give the surface a lively appearance during summer; therefore some make it a rule to turn their principal Gravel walks every spring; and the proper time is April and beginning of May, when the season is set in agreeably fine and settled, and before the surface binds too hard by dry hot weather; observing, in performing this work of turning, to dig or break-up the walk along regular, nearly to the depth of the proper good gravel, giving every part a clean turn with the spade, turning down the foul surface, and the fresh gravel to the top, laying this evenly in the most regular order; and as you go on, tread, rake, and roll, every ten or fifteen feet, as observed in new laying the walks.

GREEN-HOUSE, a garden-building fronted with glass, serving as a winter residence for tender plants from the warm parts of the world.

A very considerable share of the vegetable creation that grow naturally in distant warm climates in open fields, &c. at all seasons, which in their culture in this climate require protection in winter; observing, however, those of the Green-house department being only from the warmer parts of the world, require protection only from frost, not needing aid of artificial heat, like stove-plants, from the hottest regions, except in very intense weather; when the aid of a moderate fire, burned either within the house, or in a furnace without, in the end or back wall, communicating the heat to flues or funnels ranging along the inside, though sometimes there may not be an absolute occasion for any fire-heat during the winter in mild temperate seasons; yet it is advisable in constructing a Green-house to erect flues to use occasionally, which will prove serviceable, not only in severe frosts, but also in long moist foggy weather; a moderate fire now and then will dry up the damps, which would otherwise prove pernicious to several of the tender kinds of plants.

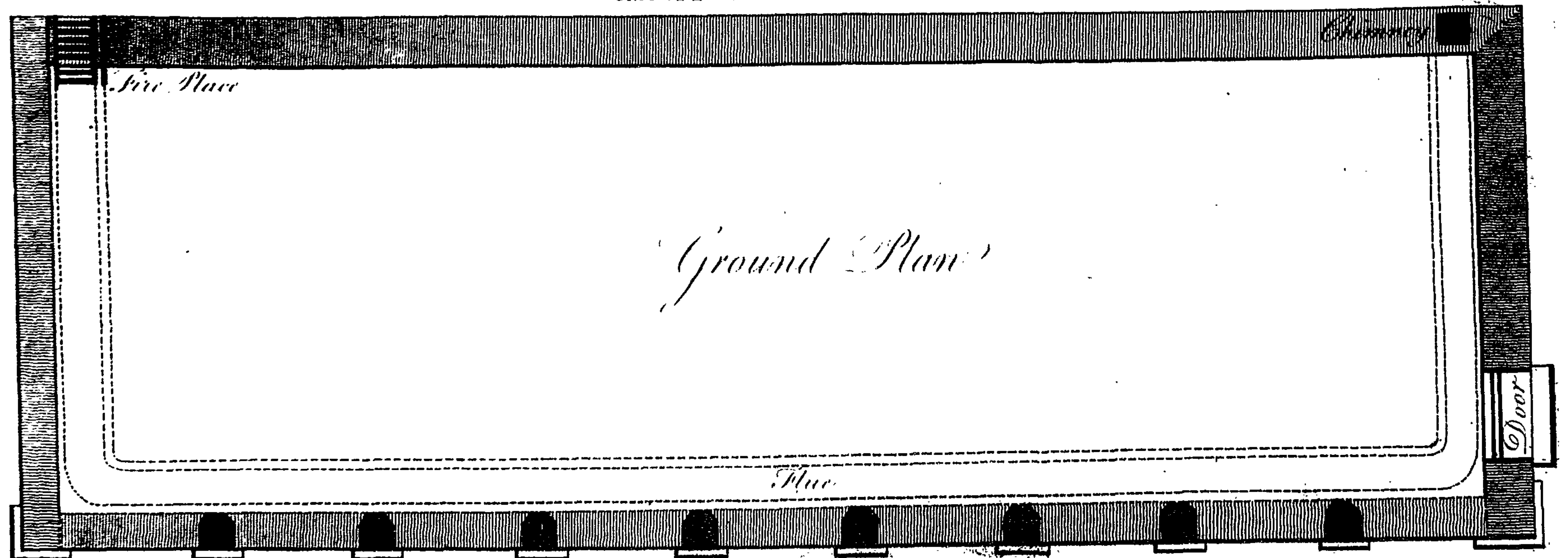
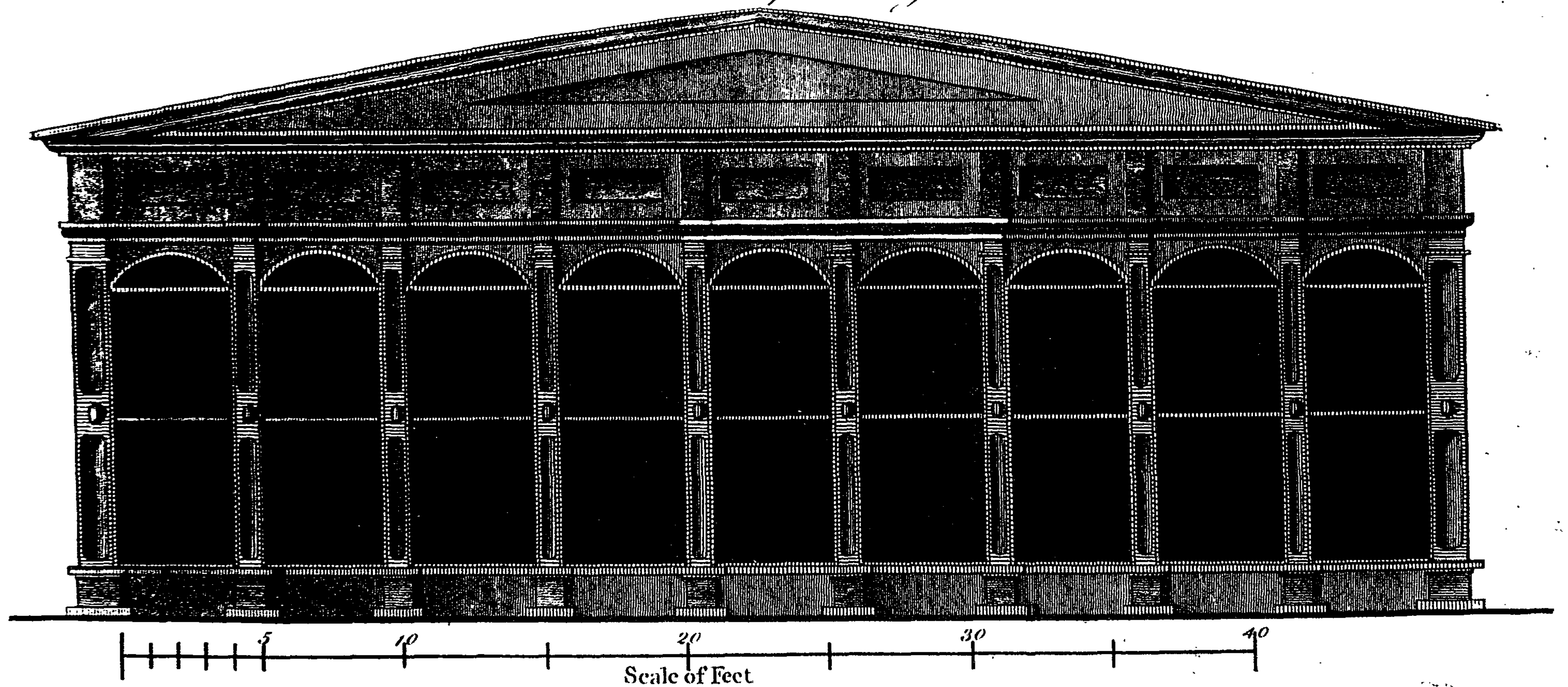
We will first exhibit a general sketch of the dimensions of a Green-house, then give a list of all the principal Green-house plants usually cultivated in the English gardens, together with their general culture.

A Green house should generally stand in the pleasure-ground, and, if possible, upon a somewhat elevated and dry spot, full to the south, and where the sun has full access from its rising to setting; the building is commonly of brick or stone, having the front almost wholly of glass-work; and must range lengthways east and west, with the front directly facing the south, and should generally be constructed

upon an ornamental plan. As to its general dimensions, with respect to length, width, and height, it may be from ten to fifty feet or more long, according to the number of plants you design it shall contain; and its width may be from ten or fifteen to twenty feet; though, for a middling house, fifteen or eighteen feet is a sufficient width; and its height in the clear, should be nearly in proportion to the width: but as to the erecting rooms over it, as is commonly directed, I should advise to have none, as being not only an unnecessary expense, but gives the building a heavy look; for all garden-buildings should have a light airy appearance.

The walls in the back and ends, or particularly the former, should be carried up two bricks, or about eighteen inches thick; though if the building is to be more than fifteen feet high, the walls should be two bricks and a half thick; and at one end of the back wall, without-side, it is eligible to erect a furnace for burning fires occasionally, as before observed, communicating with flues within, ranging in two or three returns along the back wall, also one flue running along the front and end walls, raised wholly above the floor; all of which will be extremely serviceable in time of intense frosts, and very damp foggy weather; and as to the front of the building, it should have as much glass as possible, and a wide glass door should be in the middle, both for ornament and entrance, and for moving in and out the plants; and it would be convenient to have also a smaller entrance door at one end: the width of the windows for the glass sashes, may be five or six feet; and the piers between the sashes may be either of timber, six, eight, or ten inches wide, according to their height, or if of brick or stone work, must be two feet wide at least, to be duly substantial, sloping both sides of each pier inward, that by taking off the angles, a freer admission may be given to the rays of the sun: for the same reason have the bottom of the sashes to reach within a foot of the floor of the house, and their top reach almost as high as the ceiling; and if brick or stone piers two feet wide, shutters may be hung within-side to fall back against each pier: the roof may either be half glass-work, next the front; the other half slated, especially if the upright or front piers are of timber; and shutters to cover the top glasses may be contrived to slide under the slated roof: but if the piers are of brick or stone, it is common to have the roof entirely either slated or tiled, but slating is the most ornamental, either for a half or whole roof; and the ceiling within should be lathed, and which, as well as the whole inside wall, should be well plastered and white-washed.

But



But in the modern construction of Green-houses, in order to have as much glass as possible in front, the piers between the sashes are commonly of timber only, from six to eight or ten inches thick, according to the height, so as to admit as great a portion of light and heat of the sun as may be; and on the same consideration, continue glass-work sloping half way up the roof, the other half slated, as above observed; and sliding shutters also contrived to slide under the slated roof, to draw down occasionally in severe weather, or in time of hail storms, to defend the glasses; and for the front, may have either wooden or canvas shutters, or large canvas cloths upon rollers, to let down occasionally; or, in default thereof, nail up garden-mats in severe weather.

Sometimes Green-houses for large collections of plants, have two wings, of smaller dimensions, added to the main building, one at each end, in a right line, separated sometimes from it by a glass partition, with sliding sashes for communication, and the front almost wholly glass-work, and half glass roofs as above hinted; thus by these additional wings, the Green-house consists of three divisions, whereby the different qualities and temperatures of the various plants can be more eligibly suited. The middle or main division may be for all the principal and more hardy, woody or shrubby kinds, which require protection only from frost; one of the wings may be appropriated for the succulent tribe, and the other wing for the more tender kinds that require occasional heat in winter, yet can live without the constant heat of a stove.

On whatever plan the Green-house is constructed, let the whole inside, both ceiling and walls, be neatly finished off with plaister and white-wash, and all the wood-work painted white; and the bottom paved with large square paving tiles, or some similar materials.

The necessary utensils of the Green-house are principally some treffels or stands for the support of boards, on which to arrange the pots of plants, of some sorts, so as to have their heads range in a gradual slope from the back part to the front; but as some of the plants may be tall and in large tubs, and either do not require stands, or cannot be easily placed thereon, such must be regulated as you shall see convenient.

From the above general sketch, any one may form an idea of the principal dimensions of a Green-house, which he may enlarge or diminish as it may suit his convenience.

Green-house Plants.

We will now proceed to exhibit, at one view, a list of the principal Green-house

plants, having recourse for particulars to each respective genus.

Agave, *Agave* or *American Aloe*.—Common great American Agave, with entire green leaves, and a branching flower stalk—Common Agave with striped leaves—Virginia Agave with narrower pale-green leaves, (*All succulent plants.*)

Aloe, *African Aloe*.—Mitre-shaped Aloe—Tree, or Sword Aloe—Aloe Ferox—Fan Aloe—Succotrine Aloe—Soap Aloe—Partridge-breast Aloe—Tongue Aloe—Warted-tongue Aloe—Pearl-tongue Aloe—Cob-web Aloe—Hedge-hog Aloe—Cushion Aloe—Spiral Aloe—Pentangular Spiral Aloe—Triangular Spiral Aloe—*Iris Uvaria* Aloe; this Aloe will also live in a warm border.—(*All succulent.*)

Andromeda, Tree Andromeda, or Carolina Sorrel-tree.—(*Shrubby.*)

Anthericum, *Spider-wort*.—Shrubby-stalked, onion-leaved Anthericum—Aloe-leaved Anthericum—Mock-asphodel Anthericum. (*Succulent.*)

Antholyza, *Æthiopian Corn-flag*.—Ringent Scarlet Antholyza—Æthiopian Crimson Antholyza—Cunonia, or large-spathæed scarlet-flowered.—(*Herbaceous.*)

Anthospermum, *Amber-tree*.—Æthiopian Smooth Amber-tree—Ciliated Amber-tree.

Anthyllis, Jupiter's Beard, or *Barba Jovis*.—Common *Barba Jovis*, or Silver Bush—Spanish ternate-leaved *Barba Jovis*—Dwarf Portugal *Barba Jovis*—Erinacea, or Prickly *Anthyllis*. (*All of shrubby growth.*)

Antirrhinum, *Snap-dragon*.—Variegated Snap-dragon—Gibraltar spotted-flowered *Linnaria*—Dalmatian Toad-Flax. (*Both of an herbaceous nature.*)

Arctotis, *Arctotis*.—Rough-leaved Arctotis—Narrow-leaved Arctotis—Sea Ragwort-leaved Arctotis—Plantain-leaved Arctotis—Stalkless Arctotis; (*are mostly of a shrubby nature, except the last sort.*)

Aristolochia, *Birth-wort*.—Evergreen Aristolochia—Pistolochia, or small Birth-wort—Shrubby Birth-wort. (*The two first are herbaceous, the other shrubby.*)

Artemisia, *Mug-wort*.—Tree Wormwood. Asclepias, *Swallow-wort*.—Shrub Asclepias. Asparagus. White Prickly Asparagus.—Declinated Bristly-leaved Asparagus—Acute-leaved Asparagus—Retrofracted Great Prickly Asparagus; have all somewhat shrubby stalks.

Aster, *Star-wort*.—Shrubby African Aster. Astragalus, *Milk-vetch*, &c.—The *Tragacanth*, or Goat's-thorn; several varieties. (*All shrubby.*)

Atropa, *Deadly Night Shade*.—Shrubby
Deadly Night Shade of Spain.

Baccharis, *Ploughman's Spikenard*.—Iva-
leaved *Baccharis*—Olander-leaved *Baccha-*
ris—Halimus-leaved *Baccharis*. (*All shrub-*
by.)

Bofea, *Tereva-mora*, or Shrubby Golden-
rod Tree.

Brunia, Knot-flowered, or imbricated-
leaved—Woolly, heath-leaved—*Abroto-*
noides, or thyme-leaved—radiated. — (*All*
shrubby.)

Bryonia, *Bryony*.—African Tuberous-root-
ed *Bryony*. (*Herbaceous.*)

Bubon, *Macedonian Parsley*.—Shrubby Gal-
baniferous *Bubon*—Shrubby Gummiiferous *Bu-*
bon.

Buddlea—American long-spiked—Occiden-
tal American—Globular-headed. (*All shrub-*
by.)

Bupthalmum, *Ox-eye*.—Shrubby Jamaica
Ox-eye—Maritime, or Sea *Ox-eye*.

Bupleurum, *Hare's-ear*.—Shrubby *Æthio-*
pian *Hare's ear*—Shrubby *Difforme*-leaved
Cape *Hare's-ear*.

Cacalia, *Foreign Colt's-Foot*.—*Cacalia Fico-*
ides—*Kleinia*, or Indian *Cacalia*—*Anteu-*
phorbium *Cacalia*—Papillary *Cacalia*. (*Suc-*
culent.)

Cactus, *Melon-thistle*.—*Cactus* *Opuntia*,
or Common Indian Fig. — (*Succulent.*)

Calendula, *Marigold*.—Shrubby Cape Ma-
rigold—Shrubby Grass-leaved *Æthiopian* Ma-
rigold.

Calla, *Sweet Calla*, or *Æthiopian Arum*,
(*Herbaceous.*)

Campanula, *Bell-flower*—American Bell-
flower. (*Herbaceous.*)

Canarina, Canary Bell-flower. (*Herba-*
ceous.)

Canna, *Indian Flowering-Reed*.—Common
Indian Flowering-Reed, and varieties—Glauc-
ous Indian Reed. (*Herbaceous.*)

Capparis, *Caper Bush*.—Spinous *Cappa-*
ris, or True *Caper* Shrub.

Cassine, Cape *Phillyrea*.—*Maurocenia*, or
Hottentot Cherry. (*Shrubby.*)

Ceanothus.—African *Ceanothus*. (*Shrub-*
by.)

Celastrus, *Staff-tree*.—*Pyracantha*-leaved
Celastrus—Box-leaved—Myrtle-leaved.
(*Shrubby.*)

Ceratonia, Carob-tree—Common Carob-
tree, or St. John's Bread.

Chamærops, Dwarf Palm.

Chrysanthemum.—Shrubby Canary *Chry-*
santhemum—Shrubby Floscular *Chrysanthem-*
mum.

Chrysocoma, Goldy-locks—Shrubby Co-

ma Aurea, or Greater African Goldy-locks—
Shrubby Nodding Goldy-locks.

Cistus.—Bay-leaved *Cistus*—Sea-Purflane-
leaved *Cistus*; also several of the other species.
See *CISTUS*. (*Shrubby.*)

Citrus, Citron-tree. — Lemon-tree, and
Orange with all the varieties of each. See
CITRUS.

Cliffortia; Ilex-leaved *Cliffortia*. (*Shrubby.*)

Cluytia; *Alaternoides* *Cluytia*.—Purflane-
leaved *Cluytia*—*Elateria*, or Indian *Cluytia*.
(*All shrubby.*)

Colutea; Shrubby *Æthiopian* Scarlet Co-
lutea.

Convolvulus.—Ever-green Canary Con-
volvulus—Silvery *Convolvulus*. (*Shrubby*)

Coronilla.—Valentine *Coronilla*—Glaucous
Coronilla—Silvery *Coronilla*. (*Shrubby.*)

Cotyledon, *Navel-wort*.—Round-leaved—
Long-leaved—Hemispherical-leaved. (*Suc-*
culent.)

Crassula, *Lesser Orpine*.—Several species,
see *CRASSULA*, (*Succulent.*)

Crinum, *Asphodel Lily*.—African *Aspho-*
del Lily—Broad-leaved. (*Herbaceous.*)

Cyclamen.—Persian *Cyclamen*—Several
varieties. See *CYCLAMEN*. (*Herbaceous.*)

Dais.—*Cotinus*-leaved. (*Shrubby.*)

Digitalis, *Fox Glove*—Shrubby Canary
Fox Glove.

Diosma, *African Spiræa*.—Opposite-leaved
—Hairy-leaved—Red *Diosma*, &c. (*Shrub-*
by.)

Dracocephalum.—Canary *Dracocephalum*,
or Balm of Gilead. (*Herbaceous and under-*
shrubby.)

Ebenus, *Ebony*.—Ebony of Crete. (*Shrub-*
by.)

Erodium. Pentandrious *Geranium*, or
Crane's Bill—Thick-leaved—Upright—
Dwarf-growing—Incarnate-flowered. (*Her-*
baceous and undershrubby.)

Erythrina, *Coral-tree*—Herbaceous *Ery-*
thrina.

Euphorbia,—most of the sorts. See *EU-*
PHORBIA. (*Succulent.*)

Genista, *Broom*.—Shrubby Canary Broom.

Geranium. All the shrubby kinds, and
some herbaceous. See *ERODIUM*, *GERA-*
NIUM, and *PELARGONIUM*.

Gnaphalium.—Oriental *Gnaphalium*, and
varieties—Sweet-scented *Gnaphalium*, &c.
(*Undershrubby.*)

Gordonia, Loblolly Bay.

Gorteria, — Rigid-leaved, herbaceous—
Shrubby prickly-leaved.

Grewia.—Occidental *Grewia*. (*Shrubby.*)

Halleria. — African fly Honeyfuckle.
(*Shrubby.*)

Helio-

Heliotropium, *Turn-sole*.—Shrubby Peruvian *Heliotropium*.

Hermannia, *Althæa-leaved*.—Alder-leaved. — *Lavender-leaved* — *Gooseberry-leaved*. — (*Shrubby*.)

Hypericum, *St. John's Wort*.—Warted-leaved *Minorca St. John's Wort*.—*Carolina St. John's Wort*.—*China Monogynous St. John's Wort*. (*Shrubby*.)

Jasminum. — *Jasmine*. — *Catalonian Jasmine*.—*Azorian Jasmine*.—*Yellow Indian Jasmine*. (*Shrubby*.)

Iberis, *Candy-tuft*.—Ever-green Tree-Candy-tuft; and Ever-green Striped-leaved—Ever-flowering Tree-Candy-tuft.

Inula, *Inula*. (*Undershrubby*.)

Justicia, *Malabar-nut-tree*.

Ixia.—African Woolly-headed *Ixia*.—Bulbiferous *Ixia* — *Flexuous Ixia* — *Corymbous Spotted-flowered Ixia*. (*Herbaceous*.)

Kiggelaria.—African *Kiggelaria*. (*Undershrubby*.)

Lantana, *American Viburnum*. — African *Lantana*, or *Ilex-leaved Jasmine*.—*Sage-leaved Lantana*. (*Shrubby*.)

Lavatera.—Cape *Lavatera*. (*Undershrubby*.)

Lavendula, *Lavender*.—Cut-leaved *Canary Lavender*. (*Undershrubby*.)

Laurus, *Bay-tree*.—*Carolina Blue-berried Bay*.—*Red-berried Bay-tree*.—*Indian Bay-tree*.—*Cinnamon-tree*.—*Camphire-tree*.—*Deciduous Bay-tree*.

Leonurus, *Lion's-tail*. — African *Scarlet Leonurus*.—*Striped-leaved Leonurus*. (*Herbaceous*.)

Lobelia.—Shrubby, *Pine-leaved*, *Blue Lobelia*.

Lotus, *Bird's foot Trefoil*.—*Cretan Silvery Lotus*.—*Lotus Jacobæus* — *Upright Lotus*.—*Prostrate Lotus*. (*Undershrubby and herbaceous*.)

Lycium, *Box-thorn*.—African *Box-thorn*.—*Barbary Box-thorn*. (*Shrubby*.)

Malva, *Mallow*.—African *Shrub Mallow*.

Mediola. — *Climbing African Mediola*. (*Undershrubby*.)

Medicago.—Shrubby *Hoary Medicago*, or *Moon Trefoil*.

Melia.—*Bead-tree*.

Mentha, *Mint*.—*Tree-Mint*.

Mesembryanthemum, *Fig Marigold*.—Many curious species. See MESEMBRYANTHEMUM. (*Succulent*.)

Morea. — *Canaliculated-leaved Morea*.—*Rush-leaved Morea*.

Myrica, *Gale*, *Sweet Willow*, and *Candleberry Myrtle*.—*Oak-leaved Myrica*.—*Æthiopian Heart-leaved Myrica*. (*Shrubby*.)

Myrtus, *Myrtle-tree*.—Common *Myrtle*; there being but one species of Common *Myrtle*, which comprehend many eminent varieties. See MYRTUS. (*Shrubby*.)

Nerium, *Oleander*, or *Rose-bay*.—Common *Oleander*.—with red flowers—scarlet-flowers—white flowers—double flowers—striped-leaved. (*Shrubby*.)

Olea, *Olive-tree*.—European *Olive-tree*.—Cape, or African *Olive-tree*.

Ononis, *Rest Harrow* — Shrubby Spanish *Ononis*.

Origanum, *Origany*.—*Dittany of Crete*.—*Dittany of Mount Sipylus*.—*Cretan Marjoram*.—*Origany of Smyrna*. (*Undershrubby*.)

Ornithogalum, *Star of Bethlchem*.—Cape *Ornithogalum*. (*Herbaceous*.)

Osteospermum.—Hard-seeded *Chrysanthemum*. (*Shrubby*.)

Othonna, *Ragwort*. — *Pectinated-leaved Othonna*.—*Southernwood-leaved*. (*Shrubby*.)

Passerina, *Sparrow-wort*.—Shrubby African *Passerina*.

Pelargonium, *African Geranium*.—Many shrubby species. See the genus PELARGONIUM.

Periploca, *Virginian Silk*.—African hoary climbing *Periploca*, and varieties. (*Undershrubby*.)

Phlomis, *Jerusalem Sage*.—*Yellow Phlomis*, and varieties—*Purple Phlomis*. (*Shrubby*.)

Phylica, *Bastard Alaternus*.—*Box-leaved Phylica*.—*Heath-leaved*. (*Undershrubby*.)

Phyllis, *Bastard Hare's-ear*, or *Simpla Nettle*. (*Undershrubby*.)

Physalis, *Alkekengi*, or *Winter Cherry*.—*Somniferous Winter Cherry*.—*Flexuous Winter Cherry*. (*Shrubby*.)

Pistacia, *Pistachia Nut*, and *Mastic tree*, two or three varieties. (*Shrubby*.)

Polygala, *Milk wort*.—Shrubby *Myrtle-leaved Polygala*.

Portulaca, *Parflane*.—Shrubby *Cape Purflane-tree*.

Poterium, *Burnet*.—Shrubby *Prickly Burnet*.—*Prasium*, *Shrubby Hedge Nettle*.

Protea, *Silver-tree*.—Common *Silvery Protea*, or *Changing-tree*.—*Coniferous Protea*. (*Shrubby*.)

Punica, *Pomegranate-tree*.—*Dwarf Pomegranate*.

Rhamnus, *Buck-thorn*.—*Broad-leaved Indian Rhamnus*.—*Zizyphus*, or *Jujube*. (*Undershrubby*.)

Rhus, *Sumach*.—African *Hoary Sumach*, and varieties — African *Narrow-leaved Sumach*, and varieties—*Shining-leaved African Sumach*. (*Shrubby*.)

Royena,

Royena, African Bladder-nut. (*Shrubby.*)
 Rumex, *Dock*.—Sorrel-tree.
 Ruscus, *Knee-holly*.—Alexandrian Laurel
 —Tongue-upon-tongue Laurel: they will al-
 so grow in the full air, but are liable to injury
 from frost. (*Shrubby.*)
 Salvia, *Sage*.—Shrubby African Golden-
 flowered Sage—Shrubby African Blue-flow-
 ered Sage—Canary Sage—Mexican Sage,
 or Shrubby Mexican Clary. (*Shrubby.*)
 Scabiosa, *Scabious*.—Shrubby Scabious.
 Selago.—Corymb Selago. (*Undershrubby.*)
 Sempervivum, *Live-ever*, or *House-leek*.
 Tree House-leek—Variegated Tree House-
 leek—Lesser Canary Tree House-leek. (*Suc-
 culent.*)
 Senecio, *Groundsel*.—Shrubby African
 Groundsel.
 Sideritis, *Iron-wort*.—Canary Iron-wort—
 Cretan Iron-wort. (*Shrubby.*)
 Smilax, *Rough Bindweed*.—Chinese Rough
 Bindweed, or China-root—Laurel-leaved
 Rough Bindweed; with several varieties of
 each. (*Undershrubby.*)
 Solanum, *Night-shade*.—*Amomum Plinii*,
 Bastard Capicum, or Winter Cherry—Afri-
 can Jagged-leaved Solanum, or *Pomum Amoris*
 —American Twin-fruited Solanum—Thorny,
 Downy Night-shade. (*Shrubby and herba-
 ceous.*)
 Stoebe.—Bastard Elichrysum. (*Under-
 shrubby.*)
 Tanacetum, *Tansy*.—Shrubby Æthiopian
 Tansy—Undershrubby Samphire-leaved
 Tansy—Tree Tansy.
 Tarchonanthus.—Shrubby African Flea-
 bane.
 Tetragonia.—Shrubby *Tetragonia*.
 Teucrium, *Germander*.—Spanish Tree-
 Germander—Broad leaved Tree-Germander
 —*Polium*, or Mountain Poly.—*Marum*, or
 Syrian Mastich. (*Shrubby and Undershrubby.*)
 Tropæolum, *Indian Cress*.—Double Indian
 Cress, or *Nasturtium*. (*Herbaceous, with
 stalks durable.*)
 Vitex, *Chaste-tree*.—Ever-green Chaste-
 tree.
 Ulex, *Furze*, or *Whins*.—African Berry-
 bearing Furze. (*Shrubby.*)
 Xeranthemum.—Broad-leaved *Xeranthemum*—
 Narrow-leaved *Xeranthemum*—Trailing
Xeranthemum. (*Shrubby.*)
 Yucca, *Adam's Needle*.—Common Adam's
 Needle—Thready-leaved Adam's Needle—
 Aloe-leaved *Yucca*.—Dragon Tree-leaved
Yucca. (*Shrubby stemmed and succulent.*)
 Zygophyllum, *Bean Caper*.—Sessile-leaved
 Bean Caper—Purslane-leaved Bean Caper.
 (*Shrubby.*)

For other different species and varieties of
 the foregoing list of green-house plants, and
 the particular description, &c. of the species
 in general of this collection, see the respective
 genera under their generical names as above,
 as they occur alphabetically in the different
 parts of this book.

With respect to the general culture of the
 above list of Green-house exotics, they must
 be kept constantly in pots, or some large sorts
 in tubs, for moving them into shelter in win-
 ter, and into the open air in summer; for be-
 ing all exotics from various warm parts of the
 world, are of tender quality here, and conse-
 quently not able to live in the open air in the
 winter; therefore, requiring the protection of
 the Green-house during that season, are deno-
 minated Green-house plants.

Most of them will prosper in any good rich
 earth of a garden; some sorts, however, re-
 quire a particular compost, which will be al-
 ways explained under each particular article
 in its proper genus; and most of the succulent
 tribe, as being replete with moisture, should
 always be planted in a dry, poor, lean, rub-
 bishy soil. See COMPOSTS.

As to the pots and tubs to contain the plants,
 they must be of different sizes, according to the
 size and nature of the plants, which, as they
 advance in growth, should have larger pots,
 &c. accordingly; and when they become too
 large for the pots, they must be shifted into
 tubs, hooped with iron, with two iron han-
 dles to each at top. See POTS and TUBS.

In planting the different sorts, be careful
 that the pots or tubs have holes at bottom for
 the discharge of redundant moisture; observ-
 ing, however, previous to putting in the earth,
 to cover each hole with a piece of tile or oys-
 ter-shell, to prevent their being stopped up
 with the earth, and the earth from being
 washed out, &c.

As to the mode of propagating the various
 sorts, it is in some by seed, others by layers,
 cuttings, slips, off-sets of the roots, &c. and
 some by grafting, inoculation, and inarching;
 all of which is illustrated under their several
 genera.

And as to the mode and times of planting
 each sort, it is also fully explained under their
 several genera as they occur in the course of
 this work.

Therefore, supposing all the sorts to be now
 raised, and planted in their proper pots, soils,
 &c. we will just give some hints for their ge-
 neral management.

*Removing them into the Open Air in the Sum-
 mer, and Management there.*

All the sorts succeed in the open air from
 May,

May, or beginning of June, until October; and from October until May or June again, as just observed, require the shelter of the Green-house: therefore, about the middle of May is the time to remove the more hardy kinds of Green-house plants, in their pots, into the full air, such as all the varieties of Myrtles, Geraniums, Oleanders, Cistuses, Philomises Shrubby Aster, Tree-wormwood, Tree-Candy-tuft, Yellow Indian and Spanish Jasmines, Indian Bay, &c. and in the last week in May or first in June, according as the season proves more or less favourable, bring forth all the other sorts; but this should not be done until the season is become perfectly settled, and a fair prospect of summer being arrived, for we have often very cold nights, and frequently frosty mornings, in May, and even in the beginning of June. which, if the plants were fully exposed, would pinch the ends of their young shoots and leaves, and greatly deface them. It is a good observation, that when the mulberry-tree, which is a late shooter, begins to expand its leaves, is a certain sign of the approach of summer, and settled weather, fit to begin moving out most sorts of Green-house exotics. A mild warm day should be chosen for this work; and if a warm rain, it will be of much advantage, as it will wash the leaves and branches from the dust they have contracted, and greatly refresh the plants.

When they are first brought out, it is proper to place them in some sheltered sunny place, for a fortnight, till they are inured to the open air; then you may place them in any open exposure where you design they shall remain for the summer.

As soon as they are brought out, let them be cleared from all dead leaves, and all dead wood; and let the earth on the surface of the pots be stirred, taking a little of the old out, and add some fresh mould in its stead, which will prove very beneficial; then give a moderate watering, not only to the mould, but also all over the heads of the plants, to clean them effectually from all dirt and filth they may have contracted during their residence in the Green-house.

As to the disposition of those plants in the full air, no general rule can be exhibited; it is according to fancy. Sometimes some of the handsomest plants are placed to adorn spacious fore-courts, and sometimes are arranged on each side of grand walks contiguous to the main habitation, and others near ornamental garden-buildings; they are also sometimes disposed in groups or small clumps in the most conspicuous places, in different

parts of the pleasure-ground; exhibiting different sorts in each group, to cause the greater variety.

Having, however, placed the whole abroad for the summer, their chief culture is, to supply them plentifully with water during that season, in hot dry weather: all the woody or shrubby kinds in particular, likewise the herbaceous kinds that are not very succulent, will require it three times a week at least, and in a very hot dry time once a day will be requisite; the succulent kinds must also have a moderate supply of water two or three times a week in dry weather; observing that the proper time of the day for watering all the sorts at this season, is, either in a morning before nine o'clock, or in the afternoon after four or five; for if performed in the middle of the day in summer weather, the sun would soon exhale great part of the moisture before it effected its intended operation on the fibres of the plants: this work of watering should be duly attended to in dry weather; for as the mould, roots, and fibres of the plants are circumscribed within the narrow limits of a pot or tub, the earth contained therein, as well as the fibres, consequently dries very fast in summer, and necessarily requires frequent refreshments of water, to preserve that due and constant degree of moisture requisite for the support of vegetation.

It should be observed, that moderate rains should not deter you from watering occasionally, especially such plants that have spreading heads, which prevents the rains, unless very heavy or constant, from falling in sufficient quantities on the earth of the pots, to moisten it properly.

In hot weather, if some mowings of short grass are spread on the surface of the orange-tree tubs, and others, it will greatly preserve the moisture.

During the season it will also be good culture to loosen the surface of the earth now and then, in such pots and tubs that have a tendency to bind.

Removing them into the Green house for the Winter, and Management there.

Towards the latter end of September, or as soon as the nights become cold, begin to move into the Green-house the more tender kinds of exotics of that department; the succulent tribe, in particular, should be removed to shelter at the first approach of excessive wet, and cold nights. The oranges, lemons, and all the other species of *citrus*, should also be moved into shelter in due time, either in the end of September, or early in October; for if they are permitted to remain in the open air till attacked

attacked by sharp weather, it would change the beautiful verdure of their leaves, to a rusty yellow hue, which they would not recover during winter; therefore about the latter end of September, or beginning of October at latest, begin to move in the principal plants, the succulent and others of the more tender temperature as early in the former month as the cold weather begins to come on; and continue moving in all the others as the cold increases, and by the middle of October, bring in the whole collection; observing, according as the time approaches for moving in the different sorts, to clear them perfectly well from decayed leaves, &c. and let all the pots be well cleaned, and loosen the surface of the earth in each pot, adding a little fresh mould thereto, which will prove very beneficial to the plants, as well as add an air of neatness and culture. As you bring the different sorts occasionally into the Green-house, they may be placed promiscuously, till the whole collection is brought in, then should be arranged regular, as they are to remain for the winter; leaving all the windows quite open till that time. When the whole is brought in, or bringing in, and finally arranging them, let them be disposed in regular order, so as to appear to the best advantage, both in respect to their general arrangement, as well as to exhibit variety, and so as each may have an equal portion of sun and air: let the tallest plants be therefore arranged in the back, the others in their several ranks, according to their degrees of height, gradually down to the lowest in front; and as there is a vast variety, both in size, shape, and colour, of the foliage of the different sorts, they should be so disposed as to set off each other, and give a pleasing variety to the whole; and if possible, the plants should stand clear of one another; whereby each plant will be separately conspicuous, and the whole exhibit a greater air of freedom and variety, as well as admit an equal portion of sun and free circulation of air, which will prove beneficial to the health and beauty of the whole collection.

The plants being now all stationed in their winter quarters, their principal culture, during their residence there, is the supplying them with fresh air at all opportunities in mild weather, and giving moderate waterings occasionally, picking off decayed leaves, cutting out casual decayed shoots, and making occasional moderate fires in severe weather, also sometimes to dispel great damps and noxious fogs.

With respect to giving air, this should be admitted every mild, calm day, by opening the windows more or less, according to the temperature of the weather. When the plants

are first housed, they should have as much free air as the nature of the season will admit, by opening the windows every mild day to their full extent; and if the air is quite temperate, they may remain open on nights for the first week; but in cold nights, let them be constantly shut: this work of admitting air must be constantly attended to all winter; for, without a due portion of this essential article in mild weather, the plants would lose their fine verdure, and assume a sickly yellowish colour, become diseased, and the young shoots, in many sorts, grow mouldy and rot off, and the leaves of the plants drop; therefore, never omit, every mild day, when not very damp or foggy, to open some or all of the windows, little or much, according as the air is more or less temperate; and the proper time of day during winter, for this, is from about eight, nine, or ten in a morning, till three, four, or five in the evening, according to the mildness of the day: but as the days lengthen, and the warm weather increases, give more air in proportion, earlier and later in the day as you shall judge proper, being careful always to shut all close in due time every evening, as soon as the sharp air approaches. In foggy weather it is advisable to keep the windows quite close; for the great damps occasioned by fogs, are very pernicious to these plants, whilst they are confined in the house; also when boisterous, or cold cutting winds blow towards the front of the Green-house, generally keep the whole shut, or only, if thought necessary, draw down some of the upper sashes a little way at top, above the reach of the wind rushing immediately upon the plants; likewise in all frosty weather keep the house all close, except the frost is moderate, and the middle of the day sunny and warm, when some of the windows may be opened a little, but shut them close again if the sun is clouded, and at any rate before the air changes cold; and in severe weather, let the shutters, &c. be also shut every night, also occasionally on days when the frost is extremely rigorous, and no sun: and likewise, in such weather, give assistance of fire-heat as hereafter directed. As the spring approaches, and the weather grows warmer, enlarge the portion of air accordingly, admitting it also, both earlier in a morning, and continue it longer in the evening, as the days lengthen; for then the plants will begin to assume a growing state, and a considerable portion of air is requisite every mild day, both to strengthen the new shoots and inure the plants by degrees to the air, against the time for removing them into it fully again for the summer.

Watering,

Watering, during their abode in the Green-house, will also be necessary to most of the sorts, but which must be afforded them as sparingly as possible during the winter months, and scarcely any should be given when the house is obliged to be shut close through the severity of the weather: there are no certain rules to be given for the application of this article; some plants may probably require a little water once a week, or ten, or twelve days in mild weather, such as the orange and lemon-trees, myrtles, oleanders, shrubby-geraniums, and other woody kinds; all that is necessary is, just to preserve the earth very moderately moist; therefore must examine the pots and tubs always with proper attention, and give water to such only as you see are in want thereof, not to make it a rule to give it whether they want it or no. The herbaceous kinds should be rather more sparingly watered than the shrubby sorts; and all the succulent tribe should have water but seldom, some not oftener than once a fortnight or three weeks, and that always but very sparingly at each time: and some that are very succulent will require but very little from November till March; and indeed all the succulents should only have it now and then at this season, when the earth in the pots appears very dry.

In performing the work of watering in general, be particularly careful to water with great moderation whilst the plants remain in the Green-house; for if you once over-wet the earth at this season, it will remain so for a long time, and by chilling the tender fibres of the roots, the consequence will often prove the loss of the leaves of many of the plants, and even the death of some sorts.

A sunny day, from about eleven to two o'clock, is the proper time for watering during their residence in the Green-house.

Let soft water if possible be used, or at least such that has been exposed to the air two or three days to soften it a little.

In frosty weather great attention is requisite to keep all the windows close, night and day, unless the frost is but moderate, as before observed, and the middle of the day sunny and warm, when some part of the house may be opened a little for two or three hours, having particular regard to shutting all close in due time in the afternoon, before the air changes sharply cold: and in very severe frosts keep a close night and day; and let the shutters, if any, or other covers of canvas or mats, be also used every night; also occasionally in the day-time, when the weather is intensely severe, and no sun appears, and no flues for

fires to keep out the frost; observing, however, the shutters or other shelters, besides the glasses, must be used as little as possible in the day, only in cases of particular necessity as above, for every opportunity ought to be taken for the admission of light and fresh air, as much as the temperature of the weather will possibly admit; as most of the plants only want protection from frost, and that the common shelter of the house, with shutting the sashes close every night, will be always sufficient, except in extremely piercing weather, when the shutters, &c. must also be occasionally used; and if none, nail mats against the outside of all the glasses, especially those at top, which form a half roof, if any; for the perpendicular frosts will be more powerful in that part than in the upright glasses in front.

During severe frosty weather, if your Green-house is accommodated with flues for fires, it will be advisable to make a moderate fire at such times when the frost cannot be otherwise kept out, especially on nights; but this must by no means be continued longer than just necessary to guard against very severe frosts. In default of flues, fires are burned within the house, in pots placed in different parts towards the front: charcoal is often used, though its suffocating vapours, in close-shut houses, are often attended with danger both to the gardener and plants, so that coal, or peat, or turf fires will be better; but there is nothing so effectual and easy as flues for making fires in severe frosts.

Likewise in very cold, foggy, damp weather, a moderate fire now and then in the flues will prove very beneficial in expelling the damp unwholesome vapours, so pernicious to all plants.

Whilst the plants remain in the Green-house, all decayed leaves, &c. should be constantly picked off, being necessary both to preserve the beauty and health of the plants; decayed leaves of the succulent kinds should be cut off close with a sharp knife; the plants in general should likewise be occasionally cleaned from any filth they may contract in the house, such as dust, cob-webs, &c.

The above directions are principally all that are necessary during the continuance of the plants in the Green-house.

In May and June they are to be removed into the open air again, and managed as before directed in their summer culture.

Some Observations on their General Culture.

The plants in general will want shifting occasionally into larger pots and fresh earth, according as they advance in growth; some that are fast growers, such as some of the shrubby

geraniums, &c. will require shifting annually, or every other year; and some plants in large pots, &c. once in two or three years, and some not so often, especially some large grown American aloes, orange and lemon trees and the like, in large tubs, having therein a considerable substance of earth about the roots; or sometimes these and other similar kinds, when not convenient to shift them, have the top earth, and that a little down round the sides, loosened to some moderate depth in the spring, removing the loosened soil, and fill up the space with fresh compost; but according as the plants in general increase considerably in proportion to their nature of growth, shifting into larger pots or tubs, with some fresh earth, should not be omitted occasionally as it may seem necessary; for shifting will prove beneficial to most of the sorts, observing, in the work of shifting, most of them may be shifted with the ball of earth about their roots entire; others that are rather weak and sickly, will require shifting into entire fresh earth.

The proper time of year for shifting all the sorts is April, or before they are removed into the open air for the summer, or occasionally in autumn, in August, or beginning of September, time enough to strike fresh root before winter: observing in the work of shifting, that each plant be drawn out of its present pot or tub with the ball of earth about its roots entire, then pare off all the dry, matted fibres round the outside of the ball, and clear away also some of the old earth at sides, bottom, and top: then having the new pot and fresh earth ready, cover the holes at the bottom of the pots, &c. with pieces of tiles or oyster-shells; and having then put in some of the fresh earth, place the plant in the pot, and fill up the vacancy all around with more fresh compost, bringing it an inch over the top of the ball, and give directly a good watering, to settle the earth close in every part; after this it is necessary to place the plants to have shade from the mid-day sun for a fortnight.

Such plants that are become of a weak sickly nature, should, at shifting, have all the earth taken clean from about their roots; then wash the roots, and plant them into entire fresh earth; performing this in March or April.

The larger sorts of plants, such as the orange-trees, lemons, citrons, American aloes, and others of large growth, should, when grown large, be shifted from pots into tubs hooped with iron, having two iron handles at top, for the convenience of lifting them in and out of the Green-house, for sometimes they grow to so large a size, having tubs in

proportion, that they require two, and sometimes three or four men to move them in and out, especially some large *Agaves*.

Plants of any of the sorts which are not shifted annually, should, in spring, have the earth in the top of the pot or tub loosened to a little depth, also a little way down round the sides, taking the loosened earth out, and in its stead, add a due quantity of fresh mould, giving it directly a little water to settle it close, which will prove a very beneficial dressing, and should never be omitted to those that are not shifted.

Likewise, at any time of the year, when you perceive the surface of the earth assume a binding property, whether in the shifted or unshifted plants, it is of much service to stir it an inch depth occasionally, and may add a little fresh compost, or none at all, as you shall judge necessary.

Keep all the sorts constantly cleared from decayed leaves and dead wood, and their heads and every part clean from dust and other filth, by occasionally washing them with water, which in most sorts is done by occasional waterings all over their heads, others when very foul, by washing their leaves one and one, with a sponge and water, especially in winter, and is often necessary to the oranges and lemons, and other large-leaved kinds.

When the heads of any of the shrubby plants are become very irregular or shabby, the branches may be pruned shorter or longer as it shall seem necessary, in April or beginning of May, and they will branch out into young wood in summer, which you may regulate as occasion may require.

Or in this case, of any principal exotics assuming a declining state, such as oranges, lemons, &c. or having thin, straggling, weakly heads, or apt to drop their leaves, it would be proper in spring, April, or early in May, either to shift them wholly, or apply some fresh earth, as above, then prune the heads moderately close: and, if then convenient, to plunge them in a bark-pit under glasses, especially if before the middle or latter end of May; the heat of the bark-bed will greatly revive their growth, that they will break forth into many strong new shoots, and form handsome renewed full heads by the end of July.

Sometimes, during the winter residence of the plants in the Green-house, some drop all their leaves, either by the effects of cold, or over-watering, or sometimes by being kept long in too dry a state, as frequently occurs in myrtles and geraniums, and sometimes oranges, lemons, and others; in which case, it is proper in the spring to prune the heads, shorten-

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ing the long, strong, shoots and branches, and shift them with balls into fresh earth, or, if not shifted, loosen the earth in the top and sides of the pots, draw out the loosened mould, and supply the place with fresh. They will push forth into young shoots and leaves, and renew their heads with verdure: or sometimes myrtles, geraniums, &c. in the above state, being headed, may, when brought forth in May or June for the summer, be drawn out of the pots, and plunged in the ground in a sheltered situation and watered in dry weather; they will thus send their roots into the full earth, and break forth strongly at top into young wood and foliage, and form full heads in summer; and may then be repotted with balls of earth to the roots, towards autumn.

Never clip the heads of any of the Green-house plants with garden-shears, nor, by any mode of pruning, endeavour to trim them into any formal figure, as sometimes practised; but let every sort assume its own natural growth, only just using the knife to regulate any very irregular or rambling shoot or branch, or to thin out some where too much crowded, and to cut out all dead wood.

Respecting the propagation of Green-house plants, it, as before intimated, is effected by various methods, in the different sorts; many by seed, some by suckers, others by layers, cuttings, slips, off-sets; and some by grafting, budding, and inarching: all of which is explained for the different species and varieties, under their respective genera, to which we refer for the particulars in that business.

GREWIA, (*Grewia*).

It consists of two tender shrubs for the green-house and stove, rising five or six feet high, ornamented with oval and spear-shaped leaves, and pentapetalous flowers.

Class and order, *Gynandria Polyandria*.

Characters.] CALYX, five spear-shaped, spreading, coloured leaves. COROLLA, five spear-shaped petals. STAMINA, many gynandrous filaments, and roundish antheræ. PISTILLUM, a roundish germen, filiform style, and quadrifid stigma. PERICARPIUM, a four-lobed, quadrilocular berry, and four globular seeds.

The species are,

1. GREWIA *occidentalis*.

Occidental Grewia.] *Grewia* with a woody, smooth, dark-brown stem, branching eight or ten feet high; oval, acute, crenated leaves; and bright purple flowers singly from the sides of the young branches.

2. GREWIA *orientalis*.

Oriental Grewia.] *Grewia* with a woody brown stem, branching out laterally five or

six feet high; oval-spear-shaped, serrated, alternate leaves, and greenish flowers in clusters from the sides and ends of the branches.

These shrubs flower in summer, but are not succeeded by ripe berries in England.

They are propagated by seed, layers, and cuttings; sow the seed in pots, and plunge them in a hot-bed; layers may be performed in spring, and they will be rooted by the end of summer; and cuttings may be planted in pots also in spring, plunging them in a hot-bed: they will be rooted in two or three months.

GROVES, plantations of stately trees disposed in rows on grass-ground in gardens and parks, contiguous to spacious lawns, &c. designed both for ornament, and to form shade from the summer's sun, and shelter in winter.

In extensive gardens, Groves may be formed in different parts of the ground; a grand one contiguous to the dwelling, where it may be conspicuous, is proper, both to effect ornament, and that company may soon arrive under its shade for occasional walking in the heat of summer; others may be stationed more remote from the habitation, on the boundaries of lawns or other open spaces of grass, and near garden buildings, such as temples and other structures; for Groves, wheresoever situated, always exhibit an air of magnificence, and are the greatest ornaments to spacious gardens; and every such garden is incomplete without one or more of these plantations.

The trees to form Groves are usually disposed in several straight rows, and at such distances as their branches may so far approach each other, as to afford a moderate shade from the summer's sun, yet so distant, that each tree may have full scope to spread its branches all around, so as to exhibit their straight trunks and spreading heads distinct, according to their natural growth, and that a due portion of air and light may be admitted to promote the growth of the grass between and under them, so as to form a close, firm sward, and perpetual verdure; Groves are also sometimes formed with the trees placed irregularly, and the spaces between planted with various shrubs to form under-wood, and with serpentine gravel walks variously winding through the whole.

But Groves are of two sorts, open Groves, and close Groves.

Open Groves.—The handsomest growing ornamental forest-trees with the most spreading heads should be chosen for such plantations, and disposed in ranges from fifteen to twenty or thirty feet wide, and the same distance between the trees in each row, that each tree, as above observed, may have full scope to form a spread-

ing head, and so as to admit of the growth of grass under them sufficiently to form a good sward, and constant verdure; but if a shady Grove is required to be formed as soon as possible, one may be planted contiguous and distinct from the above, arranging the rows only at ten or fifteen feet distance, whereby it will afford shade several years before the other; and as it will always exhibit a more dark and gloomy shade for solitude, it will exhibit the greater variety, with the other more open Grove. Open Groves chiefly for shade are also formed by disposing all the trees irregularly, both that they may produce an imitation of a natural Grove, and sooner afford a perfect shade and gloominess, which they will effect considerably sooner than in straight rows; though Groves designed principally for ornament, having the trees disposed in wide ranges, appear generally with a greater air of grandeur as open Groves; but where there is extent of ground to work upon, open Groves may be formed in all the above methods.

Close Groves.—These are formed of large trees, some planted in straight lines, others irregularly disposed, having the ground between them filled with various under-shrubs, and gravel or sand walks continued through them in winding or serpentine turns; and which latter kind of Groves are sometimes continued round the out boundaries of pleasure-grounds, parks, &c. both as ornamental plantations, and to afford shady and private walking, as well as shelter from the inclemency of cold cutting winds; and the various shrubs forming the underwood will have a delightful effect in the whole excursion of the walks.

But with respect to Groves in general, it sometimes happens, when a garden is to be laid out, that large old trees are found growing upon the spot, in a proper situation to constitute a Grove, which, if they do not too greatly approach to the habitation, nor obstruct any principal prospect or distant view, should be preserved with the utmost care; and at any rate it will be better to dispense with many inconveniencies, than to destroy them, which would require an age or two to form the like with any young plantation; and that although the trees should stand ever so irregularly or close, they may be somewhat regulated by grubbing up the most irregular and ill-formed, or thinning out some, where they form too close a thicket for the design, either for an open or close Grove.

GUAJACUM Lignum Vitæ, or Pockwood.

Consists of large West Indian trees, gar-

nished with oval, blunt, and acute-lobed leaves, and decandrious five-petalled flowers.

Class and order, *Decandria Monogynia*.

Characters.] CALYX, five-parted and unequal, concave and deciduous. COROLLA, five ovate, roundish, obtuse, spreading petals, inserted in the cup. STAMINA, ten awl-shaped, erect filaments, topped with oblong, recurved antheræ. PISTILLUM, an angular germen, short, subulate style, crowned with an acute stigma. PERICARPIUM, an angulate capsule with three or five cells, each containing a bony oblong seed.

The species is,

1. *GUAJACUM officinale*.

Officinal Guajacum of the shops.] Guajacum: with obtuse leaves placed by pairs. It rises in the West Indies to be a tree of considerable bulk, the wood of which is very solid and resinous, the smaller branches are garnished with pinnated leaves, divided into two pair of oval, blunt lobes, and terminated by clusters of blue flowers, succeeded by angular capsules containing the seeds. The bark and wood of this tree is used medicinally in diet-drinks, and much esteemed for removing chronic disorders and impurities of the blood.

2. *GUAJACUM sanctum*.

St. Juan American Lignum Vitæ of Porto Rico.] With pinnatifid leaves, divided into many pairs of obtuse lobes.

3. *GUAJACUM afrum*.

African Acute-leaved Guajacum.] With pinnatifid leaves, divided into many pairs of acute lobes.

They are propagated by seeds procured from abroad; they should be sown in pots, and plunged in a hot-bed; and when the young plants have arisen three or four inches high, may be transplanted into single pots, and replunged in the bark-bed, shading them until they have taken fresh root, and afterwards managed as other tender woody exotics.

GUETTARDA, (Guettarda).

A genus furnishing a beautiful tree for the stove, a native of the East and West Indies.

Class and order, *Monœcia Heptandria*.

The species is,

GUETTARDA speciosa.

Specious Guettarda of Java and Jamaica.] With very large ovate-roundish, venose, entire leaves; and male and female flowers distinct on the same plant; growing in forked cymose bunches; having each a cylindric cup, long, tubulous, funnel-shaped corolla, divides above in seven oblong lobes, containing seven short stamina in the males; and in the females a roundish germen, filiform style, crowned with a cylindric-headed stigma, succeeded

ceeded by a roundish drupaceous dry-fruit, furnished with seeds.

This being a most tender Indian exotic, requires the constant protection of a hot-house in this country; is propagated by seeds obtained from abroad; and may also try layers and cuttings of the young wood; the whole by means of a hot-bed, or the bark-bed in the stove.

It must be continued always in the stove or hot-house, and have the common culture of other woody exotics of the same temperature.

GUILANDINA, *Bonduc*, or *Nickar tree*.

A genus of tree and shrub exotics of America and the West and East Indies; one a fine deciduous ornamental tree for the pleasure-ground; the others, tender kinds for the hot-house collection; growing with erect, firm, and slender stems and branches in the different species; adorned with large, beautiful, pinnated leaves, six inches to half a yard long; and terminal and lateral spikes of pentapetalous yellow flowers in summer and autumn.

Class and order, *Decandria Monogynia*.

Characters.] **CALYX**, monophyllous, bell-shaped, five-parted at the brim. **COROLLA**, five spear-shaped, concave, sessile petals. **STAMINA**, ten subulate, erect filaments inserted into the cup, and single antheræ. **PISTILLUM**, an oblong germen, slender style, and simple stigma. **PERICARPIUM**, a rhomboidal, broad, oblong, swelling, unilocular pod, including large, roundish-oval, hard seeds.

The principal species are,

Hardy kind.

GUILANDINA *diæca*.

Diæcous Canada Bonduc, or *Nickar-tree*.] With an upright, firm stem, and smooth ash-coloured branches, rising fifteen or twenty feet high; large doubly-pinnated leaves, of many smooth entire folioles placed alternate; and with some diæcious flowers, or male and female on two distinct plants; flowering in July or August, but rarely produce seeds in this country.

Tender kinds.

2. **GUILANDINA** *Bonduc*.

(*Bonduc*)—*Common Indian Bonduc*.] With

prickly stem and branches; large pinnated, ovate leaves, the folioles armed with single spines.

3. **GUILANDINA** *Bonducella*.

(*Bonducella*)—or *Lesser Indian Bonduc*.] With prickly stems, and pinnated, oblong-ovate leaves, having folioles armed with spines in pairs.

4. **GUILANDINA** *Moringa*.

(*Moringa*)—or *Ceylon Nickar tree*.] With unarmed stem, and doubly-winged leaves, having the under pinna trifoliate.

Of the above species of *Guilandina*, the first is the most noted and common in the British gardens, a native of Canada, and hardy to prosper here in the full ground, and endure our severest winters; and is a very desirable deciduous tree to assemble in the shrubbery plantations, where it will effect a conspicuous contrast and diversity in its fine pinnated leaves: the other species are tender, being exotics from the hot regions of the West and East Indies, require to have constant residence in a stove in this country, in which they are retained in some curious collections; and they form an agreeable variety in their large winged foliage.

The first species is propagated by seeds, layers, suckers, and by cuttings, principally of the roots: the seeds are procured from America by the seedsmen, which sow in the spring, as soon as obtained, in a bed or border, &c. of common earth, and the young plants managed nearly as other hardy seedlings: make layers of the young wood in autumn, flitting them underneath at a joint; or suckers, where any occur, may be planted off in autumn or spring, and cuttings of the upper running roots, or some cut and turned up in winter.

The tender or stove kinds are also propagated by the methods as above; but the pots must be plunged in the bark-bed in the stove, or some other; the seeds are procured from the Indies, where the plants grow naturally; and they, being remarkably hard, a previous soaking, a day or two, will facilitate their germination, sowing them directly; the wood being also hard, it does not emit roots freely by cuttings.

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HÆMANTHUS, Blood-flower.

The plants are bulbous-rooted, herbaceous, flowery perennials for the stove, having the roots crowned with long leaves, and erect flower-stalks a foot high, terminated by clusters of monopetalous, six-parted, liliaceous-shaped red flowers.

Class and order, *Hexandria Monogynia*.

Characters.] CALYX, a large, six-leaved, permanent involucre, shaped like an umbel. COROLLA is one erect petal, divided into six parts. STAMINA, six awl-shaped filaments, and oblong, incumbent antheræ. PISTILLUM, a germen under the corolla, single style, and stigma. PERICARPIUM, a roundish trilocular-berry, and three seeds.

The species are,

1. HÆMANTHUS coccineus.

Scarlet Cape Hæmanthus, or Bloody Lily.]

Hæmanthus with a large, tunicated, bulbous root; crowned by tongue-shaped, flat, smooth, fleshy leaves, spreading on the ground; and an upright, thick, spotted stalk, from three to ten or twelve inches high, terminated by a large cluster of blood-red flowers in autumn.

2. HÆMANTHUS puniceus.

Red Guinea Hæmanthus, or Bastard Dragon.]

Hæmanthus with a large, bulb-like, fleshy, tuberous root, sending up thick, fleshy stalks a foot high, spotted like the dragon-plant, and garnished with lanceolate-oval, waved, erect leaves, and large umbellate clusters of red flowers in summer.

3. HÆMANTHUS carinatus.

Carinated-leaved Cape Hæmanthus.]

Hæmanthus with a large bulbous-root, crowned by three or four long, narrow, carinated, or keel-shaped leaves; an upright, thick stalk a foot high, terminated by a cluster of pale-red flowers in autumn.

4. HÆMANTHUS ciliaris.

Ciliated Cape Hæmanthus.]

Hæmanthus with a large, bulbous root, tongue-shaped, ciliated leaves, and an upright, thick stalk a foot and half high, terminated by reddish flowers in autumn.

All these plants are exotics of Africa, and require the protection of a hot-house in this

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country, so must be always kept in pots, and continued in that department, where, if plunged in the bark-bed, they will flower annually, and make a fine appearance.

They are herbaceous, bulbous-rooted perennials, durable in root, but renew their leaves and stalks annually, flowering in summer and towards autumn; the autumnal kinds generally flower before the leaves arise; and when the flower fades, the leaves come up, continue all winter, and decay in spring or early in summer.

Their flowers are extremely ornamental, appearing in large clusters, protruded from a large permanent involucre; each separate flower is of one petal, divided into six parts (see the *Characters*); and is succeeded by red berries; but rarely any but the second sort ripen in perfection in England.

All the sorts must be potted in light earth; and the proper time for planting, transplanting, or to new pot them, is in spring, or early in summer, when their leaves decay; and the roots may be had of most of the nurserymen, who propagate them for sale; though they increase but slowly here, so are often procured from the Cape of Good Hope, where they naturally grow; they should be planted as soon as they arrive, observing to supply them with water, which however must be but sparingly in winter.

They may be propagated by off-sets from the roots, when their leaves, &c. decay, like other bulbs; and may also be propagated by seeds sown in pots of light sandy earth, plunging them in the bark-bed in the stove.

HÆMATOXYLUM, Blood-wood, or Log-wood.

It furnishes one species, an exotic-tree of South America, retained here in stoves for variety.

Class and order, *Decandria Monogynia*.

Characters.] CALYX is five-parted, and permanent. COROLLA, five oval petals. STAMINA, ten long filaments, and small antheræ. PISTILLUM, an oval germen, simple style, and thick indented stigma. PERICARPIUM, an unilocular capsule, and compressed seeds.

There is but one species, viz.

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HÆMATOXYLUM *Campechianum*.*Campeachy Hæmatoxyllum, or Log-wood.*]

Hath an irregular, crooked stem, rising fifteen or twenty feet high, sends out many crooked branches armed with thorns, and garnished with pinnated leaves of three or four pair of lobes; and from the axillas erect bunches of pale yellow flowers, succeeded by oblong capsules containing the seeds, but do not produce any in this country.

The wood of this tree is in great estimation among the dyers, for dying purple and the finest blacks, and grows in amazing plenty in the Bay of Campeachy, and other parts of the Spanish West Indies, from whence the wood is sent to Europe as a valuable commodity, and is become a considerable branch of trade.

A few of the plants are preserved here in hot-houses for variety, where they grow freely, and attain several feet in height.

It may be propagated by seeds procured from abroad, sowing them in pots, and plunge them in a bark hot-bed: when the plants are three inches high, prick them in separate small pots, and replunge them in the bark-bed in the stove.

HALESIA, Carolina Snow-drop tree.

In this genus are two hardy, deciduous flowering shrubs, cultivated in our ornamental plantations, natives of America; both of upright, tall, shrubby growth, adorned with spear-shaped and oval leaves, and clusters of monopetalous, bell-shaped, white flowers.

Class and order, *Dodecandria Monogynia*.

Characters.] CALYX, small, monophyllous, four-parted at the edge, and persistent. COROLLA, monopetalous, ventricose-bell-shaped, the mouth cut into four parts, obtuse, spreading. STAMINA, twelve subulate, erect filaments, having oblong, blunt antheræ. PISTILLUM, an oblong germen, in the bottom of the calyx, slender style, and single stigma. PERICARPIUM, an oblong, corticated nut, with four or two membranaceous angles, and two internal loculi, in each of which is deposited a single seed.

The species are,

1. **HALESIA tetraptera**.

Quadrangular-fruited Halesia.] With shrubby stems, branching eight or ten, to twelve or fifteen feet high; garnished with lanceolate-oval, jagged leaves on glandulous foot-stalks; and clusters of white flowers at the sides of the branches, and the fruit four-angled.

HALESIA diptera.

Biangular-fruited Halesia.] With shrubby, branching stems, of similar growth to the first species; garnished with oval leaves on smooth

foot-stalks, and clusters of white flowers, succeeded by winged fruit, having two angles.

Both these are originally natives of Carolina, &c. but are hardy, and have been long in our nurseries and ornamental plantations; and are very eligible to assemble with others in forming shrubbery clumps and other compartments of that nature in pleasure-grounds, &c.

They are propagated by seeds and layers: sow the seeds in the spring, either in a bed or border of light earth in a warm situation, or in a hot-bed, which will forward the vegetation of the seeds and growth of the young plants more effectually; but must be inured to the full air all summer, and only have occasional protection in severe weather in winter till they acquire some degree of strength, then planted into the nursery: and to raise them by layers, it may be performed in autumn or spring in the young shoots of last summer; giving each a slight notch or slit at the joint, laying that part in the earth, and they will be rooted next autumn for planting off into the nursery; in which permit both these and the seedling plants to remain till of two or three feet growth, or more, for final transplanting into the shrubbery, &c.

HALLERIA, African Fly Honey-suckle.

One species, an ever-green, shrubby plant, for the green-house.

Class and order, *Didynamia Angiospermia*.

Characters.] CALYX is monophyllous, three-parted, and permanent. COROLLA, one ringent or grinning petal, having the limb erect and four-parted at top; the upper part longest, blunt, and emarginated; the side ones short and pointed; and the lower one very short and acute. STAMINA, two long and two short filaments, and didymous antheræ. PISTILLUM, an oval germen, long style, and simple stigma. PERICARPIUM, a roundish, bilocular berry, and two hard seeds.

The species is,

HALLERIA lucida.

Lucid, or shining-leaved Halleria.] Halleria with a woody stem, branching six or seven feet high; oval, sawed, shining-green leaves placed opposite; and red flowers growing scatteringly along the sides of the branches in June, succeeded by roundish berries in autumn.

This is an ever-green, shrubby plant of Africa, requiring shelter of a green-house here in winter, and must be always kept in pots, and managed as other exotics of the green-house department, and will make a pretty variety in that collection.

The

The flowers are of the grinning tribe, being formed of one irregular petal, cut into four unequal segments, and resemble some sorts of honey-suckles. See the *Characters*.

It may be raised from seed, in a hot-bed in spring; also by cuttings of its young branches, planted in pots in April, May, or June, and plunged in a hot-bed, giving occasional shade and water.

HAMAMELIS, Witch Hazel.

It furnishes one hardy deciduous shrub for the shrubbery.

Class and order, *Tetrandria Digynia*.

Characters.] **CALYX**, a triphyllous involucre, and a double proper cup, or perianthium, having the exterior part of two, and the interior part of four leaves. **COROLLA**, four long, narrow, reflexed petals, and four nectariums adhering thereto. **STAMINA**, four narrow filaments, and horned, reflexed antheræ. **PISTILLUM**, an oval, hairy germen, two styles, and capitated stigmas. **PERICARPIUM**, none. **SEMINA**, an oval nut situated in the calyx.

The species is,

HAMAMELIS virginiana.

Virginian Hamamelis.] Hath a shrubby stem, branching three or four feet high; oval, indented, alternate leaves, resembling those of the common hazel, and flowers growing in clusters from the joints of the young branches; appearing at the fall of the leaf in November and December, but producing no seeds in England.

This is an American shrub, of hardy growth; is admitted here in our shrubberies to increase the variety in the collection of hardy shrubs in extensive gardens; but its flowers are more singular for their appearance in winter, when the leaves are fallen, than their beauty.

It is propagated by seed, and by layers of its young branches.

By Seed.—This is procured from America; sow it in an easterly border, half an inch deep; they will come up the second spring, not before; so keep the ground clean from weeds till then; when, if the season proves very dry, give moderate waterings, also in summer; and when two years old, transplant them in nursery rows.

By Layers.—In autumn, or even in winter, and early in spring it may be done, and the young twigs of the last summer's shoot should be chosen; giving them a slit at a joint, lay them in the earth, and they will be rooted, and fit to transplant into the nursery by autumn following.

HAND-GLASSES, square and bell-shaped Glasses, separately movable by hand, for plac-

ing over, and protecting, and forwarding many sorts of plants in their growth.

These Hand-Glasses are of great utility in general gardening; in the kitchen garden both for protecting some tenderish plants in winter, as young cauliflower and lettuce plants; and in raising some seedling young plants of both these in the spring, and several others, either in a hot-bed defended with the said Glasses, or in a warm border under the same protection; also small fallading by the same means; which, in default of frames and lights, may be used very beneficially on many similar occasions, and are particularly necessary in the culture of the general crops of summer cucumbers, to place upon the hot-bed ridges made in April and May, and also occasionally for melon-ridges made in the same season to produce a crop of autumnal fruit; and in the flower-garden, pleasure-ground, nursery, green-house, &c. Hand-Glasses also prove very useful in propagating, raising, and protecting many kinds of curious plants in young or small growth, both occasionally in being placed on hot-beds over seeds, cuttings, &c. and on beds of natural earth, pots, tubs, and boxes of the same.

They may be employed occasionally, in want of frames and lights, in raising many of the tenderer or curious annual flowers, such as African and French marygolds, chrysanthemums, balsams, ten-weeks stocks, and others of that quality; the seeds either sown in a moderate hot-bed, or warm border, in April, and covered with Hand-Glasses, will bring them considerably forwarder than if fully exposed to the open air, or under cover of mats of nights, &c. See **ANNUAL PLANTS**.

And Hand-Glasses are very useful in striking many sorts of small cuttings and slips of tender or curious plants, such as myrtles, and other similar kinds; covering them down close with a glass, will greatly forward their rooting; also cuttings of young flower-stalks, or several sorts of flowering plants raised by that method; pipings of pinks, carnations, double sweet-williams, cuttings or slips of double wall-flowers, and of many other sorts in small cuttings, planted close in beds, borders, or pots in spring and summer, and covered with Hand-Glasses, they will much sooner emit roots below and shoots above; and likewise pots of cuttings of curious plants plunged in a hot-bed, or in the bark-bed of the stove, and covered also with a Hand-Glass, it will promote a more speedy vegetation of roots, and advancement in top growth.

Hand-Glasses being of two kinds, square or round leaded Glasses, consisting of many small panes of glass worked into the lead-work, and bell-

bell-shaped Glasses, all of one piece; shall just mention the principal particulars relating to each.

The leaded Hand-Glasses are most generally made exactly square, and sometimes round or circular-octagonal; but principally square for general use; though the others are also very eligible; and, in all of which, each is formed in an open frame-work of strong window-lead, and sometimes of cast-iron in the same form, but more commonly lead; the lower part being upright, six to eight or ten inches depth, and the upper hipped off or sloped on each side, narrowing upward, terminating in a point, as it were, at top, having in that part a fixed erect ring handle of the same material; and the glass-work, in many small panes, are laid in the lead-work, and the joints all well brushed with proper cement, to render the whole perfectly wind and water tight.

These leaded Hand-Glasses are of different dimensions, from twelve or eighteen inches to two feet wide, or more, to suit different purposes; though for general use in kitchen gardens, and for most other occasions, about eighteen inches width is the more common size, and nearly the same in depth in the whole; but some for particular occasions are of smaller sizes, from six or eight to ten or twelve inches width; and some of these smaller kinds are made circular or octagonal, to place sometimes over pots, or single plants, of particular sorts, and for several other small purposes in some curious plants and flowers of young or tender growth; however, the larger sizes should be adopted for all principal Hand-Glass occasions.

As before intimated, Hand-Glasses of the above form are sometimes framed of cast-iron, and the glass laid in putty, or leaded down; which kind of Glasses are very neat, strong, and durable, but are heavy, and treble the expense of leaded glasses; the frames being cast at the cast-iron fan-light and window-sash manufactories; and the glaziers perform the glass work, though, in all cases, these may not probably be so generally eligible, especially when the condensed moisture within adhering in drops to the rusty iron-work of the frame, and dropping upon the plants, may have a prejudicial effect on some tender kinds.

But as the difference of prices of the leaded Glasses and those of cast-iron being considerable, the latter are not likely to be adopted for general use; the former being two or three to four or five shillings; the others three times as much, according to size, which however will be more than three times the duration in use.

Bell Hand-Glasses or Bell-Glasses being all of one piece, are blown at the glass-houses, at London and Newcastle, and some other places; they are equally eligible or superior to the leaded glasses in many cases, especially in kitchen gardens, or more particularly for the preservation of plants in winter, such as the early crops of cauliflowers planted out in October or November under Hand-Glasses to stand the winter, as also sometimes lettuces under the same Glasses with the cauliflower plants; and generally those of each under the Bells, are preserved in a stronger growth than others under the leaded Glasses: and the same Glasses, when done with the early cauliflowers in April, become equally useful to place on the hot-bed ridges of cucumbers and melons, for the summer and autumn crops; and for all of which occasions, they are much used by the market kitchen gardeners.

These Bell-Glasses are in dimensions for common use nearly in proportion to that of the larger sizes of leaded Glasses above described, or rather wider below; made in the bell form, having a rough knob at top serving as a handle, by which to lift the Glasses as required; they should not be made too high and narrowing upward; but rather more squat and dome-form above, which is greatly preferable in promoting a strong growth, not so liable to draw as in higher narrow-topped Glasses, and the plants receive the benefit of the sun to greater advantage.

They may be obtained at the glass-houses of the dimensions and form required, in which they are sold at ten or twelve to fifteen pounds the hundred, or nearly in proportion for smaller quantities.

In the above two sorts of Hand-Glasses, there is this advantage attending the leaded ones, that when any of the glass-work is broken it can be readily mended or replaced by the glaziers; but the Bells, when much broken, are in a manner useless; or however if they are not broken into pieces, they may be joined with a cement of strong white lead, and placed under cover till the cement is thoroughly dry; and then, with care in handling them, they will last a long time; and it may be proper to remark, that as new Bell-Glasses are more liable to crack by frost, or too hastily moving them, than older ones seasoned to the weather; so that, in using new ones the first winter in crops of early cauliflowers, &c. should be very careful in handling the Glasses in lifting them off and on, or raising one side occasionally for the admission of air; and on which consideration, the seasoned old sound glasses are more valuable than the new.

In both the above kinds of Hand-Glasses, the leaded Squares and Bells, they are in great use in the numerous and extensive kitchen grounds in the vicinity of London; as sometimes in one considerable garden several hundred are employed, and some two or three thousand; all principally for early cauliflowers, from November till the middle or latter end of April, to protect the plants in winter and forward them in the spring, then having effected that purpose, are immediately removed to ridges of cucumbers, and sometimes melons.

HEDERA. Ivy, the Ivy-tree.

This Genus furnishes two shrubby climbers, one an ever-green, the other a deciduous plant, both celebrated for their climbing property, in ascending to the top of the highest trees, buildings, or any adjacent support, rooting in the bark of the trees, walls, &c. as they ascend.

Class and order, *Pentandria Monogynia*.

Characters.] CALYX, a small, many-parted involucre to each corymbus of flowers, and a five-parted cup to each floret. COROLLA, each floret composed of five oblong, spreading, incurved-pointed petals. STAMINA, five awl-shaped filaments, and incumbent antheræ. PISTILLUM, a turbinate germen, short style, and single stigma. PERICARPIMUM, a globular, unilocular berry, and five seeds.

The species are,

1. HEDERA *Helix*.

(*Helix*)—or *Common Ever-green Ivy-tree*.] Hath shrubby, long, flexible, rooting stalks, climbing upon support many feet high, by their cirrhus roots emitted from the sides of the stalks and branches, striking root in the bark of trees, walls, &c. as they ascend; garnished with large, lobated, and sometimes oval leaves, and corymbous clusters of greenish flowers at the ends of the young shoots, succeeded by clusters of round berries, ripening to a black, and a yellow colour, in the varieties.

Varieties.] Common black-berried ivy-tree—Silver-striped-leaved ivy—Gold-striped ivy—Yellow-berried ivy—Dwarf creeping ivy.

All these varieties are ever-green; they flower in September, and the berries continue their growth all winter, and ripen towards spring, which, in contrast with the leaves, exhibit a delightful variety; but the yellow-berried kind is rare in this country.

2. HEDERA *quinquefolia*.

Five-leaved deciduous Ivy,—commonly called *Virginia Creeper*.] Hath shrubby, very long, slender, rooting stalks, climbing upon support

an hundred feet high or more, by their cirrhus roots from the sides of the stalks, striking root in walls, &c. as they ascend; garnished with quinquefoliate, deciduous leaves, being composed of five oval, serrated lobes, closely covering all the stalks and branches in summer, dying away to a reddish tinge in autumn.

Both the above species are shrubby and durable in stem and branches; the first and varieties are ever-green; the second is deciduous, dropping its leaves in autumn; both are exceedingly hardy, prosper almost any-where, and are remarkable for their singular property of emitting rooting cirrhi all along the sides of their stalks and branches, striking root in any neighbouring support, thereby climbing to a prodigious height.

The first species, *Hedera Helix*, or common Ivy, is well known to all, by its growing wild in our woods, hedges, and upon old walls and other buildings, &c. especially the common green sort, which, by its climbing stalks and branches rooting all along in the bark of the adjacent trees, &c. ascends and surrounds their stems, and mounts to their tops; also over-runs walls, pales, and the whole sides and tops of houses, rearing its head often above the chimney, and frequently ascends to the very top of church-towers in the country; closely attaching itself to its support by its cirrhus roots emitted from all the stalks and shoots in their progress of climbing; and having reached the top of its support, of whatsoever kind, it there forms a short woody trunk, and large bushy head. In default of support, it will run upon the ground, branching and rooting as it advances, and soon cover a large space; therefore, with respect to its use in gardening, it may be planted to cover the surface of unsightly walls, old pales, and the like; which it will soon effect with little trouble; it is also excellently adapted to over-run grottos, caves, cots, hermitages, root-houses, artificial ruins, &c. to give them a more rural appearance; likewise may be planted here and there in wildernesses, close groves, shady walks, and other places of solitude, to run up large trees; and for variety, may station a plant here and there in open shrubberies, placing a stout stake or post for it to climb upon, which it will soon surround and hide, and rear its head above it, and form a thick bush at top; it may also be trained up to a stem, and made to form a bushy head. Thus may the Ivy-tree, though a common wild plant, be employed in our gardens; but its commonness rendering it of little estimation with most people, it is seldom cultivated: all the varieties, however, are

are beautiful ever-green climbers; the striped-leaved kinds in particular have singular elegance, when trained against walls in any conspicuous situation; and all the sorts may be raised abundantly by cuttings of their shoots, which root freely, make amazing progress in growth, and fasten themselves to any support with very little assistance.

The second species, *Hedera quinquefolia*, is an American plant, but so hardy that it will prosper any where, and is a true species of the Ivy, as it climbs and plants its roots into walls, &c. like that plant; is of surprising quick growth, frequently shooting twenty feet or more in one summer, striking root into the joints of walls, mounts to the top of the highest buildings, branching and spreading widely each way; and as it prospers in any situation, is well calculated to plant against any unsightly walls or high buildings, to cover them; and for which purpose it is greatly used in London, no plant being so well adapted, as it will thrive in the midst of that city, amongst the closest buildings, and soon reach their tops, covering them effectually with its beautiful five-lobed foliage in summer.

Propagation.

Both the species and respective varieties are propagated with great facility, by cuttings of their young shoots in autumn or spring in a shady border, which will readily take root, and in one year will form good plants, and may then be planted out for good where they are to remain, or remain longer in the nursery, as may be convenient: cuttings may also be planted at once where they are to remain, and they will also succeed: the common Ivy may also be propagated by seeds, sown as soon as they are ripe, in March or April, which, if kept shady and moist, will often rise the same season.

When any of the sorts are planted against walls, &c. they will only require a little conducting at first, just to nail their first shoots thereto: they will afterwards plant their roots firmly in the support, and fix themselves.

HEDGES, growing fences, employed occasionally both for use and ornament, as outward fences to gardens, and to divide the internal parts of the ground.

Growing Hedge-fences are the cheapest, the most eligible, and ornamental garden-fences that can be employed in such parts where walls, &c. are not particularly necessary for wall-trees, and may in such cases be employed, both as outward fences to garden-ground, nurseries, and plantations; as also

to divide, where necessary, the different parts of the ground; in both cases serving as a defence against men and beasts, as well as afford occasional shelter and shade to particular districts, as effectually as the best wall or paling fences.

Several sorts of shrub and tree-plants, both deciduous and ever-greens, may be occasionally employed for hedges, both as outward fences, and for dividing any internal portion of ground.

For outward Hedges.

The white-thorn, or haw-thorn-tree, forms the best outward hedge-fence in the world; which being properly trained by trimming, or clipping annually, is rendered the closest, hardiest, and most effectual hedge for a fence of any other tree yet known; and being very durable, is preferable to all others for outward Hedge-fences both to gardens and fields; also for the divisions of fields, where they are exposed to cattle; and for either purpose a hedge of this sort is formed by planting young plants or sets raised from seed in the nursery, which, when a year or two old, or as big as a goose-quill, to the size of the little finger, are proper for this use; and the methods of planting them are exhibited hereafter; and for particulars in raising the plants, see **CRATÆGUS**.

Hedges of this plant are commonly called quick-set Hedges, in a customary or confined sense, though in a general sense it may with propriety be understood of all growing Hedges, to distinguish them from dead-hedges, formed with stakes and bushes.

The black-thorn, or sloe-tree, is also proper to be employed for field Hedges, and forms a very strong durable fence; but by its producing such abundance of suckers from the root, widely on every side, as to over-run the adjoining ground, renders it the less esteemed for general use; as it is, however, well armed with thorns, and of quick growth, it may be rendered a good outward field fence against most cattle, or to divide fields, &c. generally planted on the top or side of a bank formed for that occasion; and a Hedge of this tree may be raised either by sowing the seed, i. e. the sloes, in autumn as soon as ripe, in the place where you would form the Hedge, in one or two drills the whole length, a foot asunder, and an inch or two deep, covering them over with earth; or you may first raise the plants in a nursery, or procure young sets from the neighbouring hedges, as this plant never fails affording great abundance of suckers or spawn, annually from the roots; so that having procured a proper supply of sets, of either sort, plant them in one or two rows the

whole length of your intended Hedge. See PRUNUS.

The crab-tree, both of the apple and thorny sorts of plums, are also sometimes planted for field Hedges, and will soon grow up; observing that plants for this purpose should be such as are raised from the kernels of the wild crabs, which generally come more thorny than those of the cultivated kinds, and shoot more branched and close quite from the bottom, forming a thicker growth in the Hedge order; and a Hedge of them may either be raised by sowing the kernels of the fruit in autumn or winter, in the place where the Hedge is intended, in drills the whole length an inch deep, covering them that depth with earth; or may raise plants from seed in the nursery, which, when a year or two old, plant out for good (see PYRUS and PRUNUS). A Hedge of these plants is only recommended as being of quick growth, and in default of better; and besides its property as a field-fence, some plants of the Hedge may be suffered to grow up, and they will afford an annual crop of crabs for verjuice; and a proper number of the plants may be used as they stand in the Hedge for stocks, to graft either with useful family apples, or sorts proper for cider, and, being thus grafted, may always remain to run up for standards.

The elder-tree is also frequently used for outward Hedges, especially when a fence is wanted as soon as possible, as it will form the most expeditious Hedge-fence of almost any other tree commonly used in Hedges, though not the most effectual nor beautiful; however, where an immediate outward Hedge-fence is required to any out-ground, garden, or plantation, the elder may be made to form a fenceable Hedge in one year, by planting large truncheons, or cuttings of the straightest upright shoots and branches, from two or three to six feet long, planted either upright a foot distance, and wattled along the top to preserve them firm and even; or may be placed slanting across one another chequer-wise, forming a sort of lattice-work, which will be the most effectual method. In either method of planting, sharpen the lower ends of these cuttings, making holes to receive them fifteen or eighteen inches deep, either in level ground, or the sides or tops of banks; they will readily emit roots, and shoot strongly at top the same year. But, for their general propagation, see SAMBUCUS.

The alder-tree is also proper to plant for Hedges in wet or marshy ground, as being an aquatic, and will grow by small or large cuttings like the elder, and will soon form a fence; and where Hedges are necessary by the sides of

rivers, brooks, or other water, this tree is very proper, as its roots, and numerous suckers arising from their lower parts, form such a close thicket, as effectually to preserve the earth of the banks from being undermined and washed away. See BETULA ALNUS.

The Lombardy poplar emitting numerous side-branches quite from the bottom, and being of very quick growth, may be occasionally employed to form an expeditious outward Hedge along the side or top of a bank or ditch, or to train as a loftier Hedge for shelter, shade, blind, &c. in a similar situation, or any-where, as may be required; for this tree is not reluctant to any common soil, situation, or exposure, and of which may form an immediate Hedge at once, if wanted, of five or six feet or more, having young trees, well branched from the bottom, heading the top to the above height, and planted in a single row a foot or two asunder; or may plant younger sets of two or three feet, and train them accordingly: but designed as an outward Hedge, should generally have an outside ditch; and in all of which, may be kept to an orderly thick growth, by proper clipping in summer.

Willow is also sometimes planted to form an outward Hedge along the sides of watery ditches, brooks, rivulets, &c. or any marshy or moist situation, or as required, planted either by small cuttings, or larger, long sets of several feet, and inserted in the manner directed for the elder cuttings to form an immediate Hedge; and in either method it will run up quickly, and may be kept close and regular by proper cutting.

Holly forms an excellent and most beautiful hedge, and is the best ever-green Hedge that can be planted for an outward Hedge-fence; for it grows very close, and is well furnished with leaves, which being armed with thorns, no cattle will browse upon them; and being always in foliage, affords good shelter in winter, and appears ornamental at all seasons. The only objection to a holly Hedge for general use, is its slowness of growth the first four or five years, as rooting but moderately; but when once it has established itself, it makes amends by its progress in height, strength, and thickness; and, as a fence, is equal, if not superior to any other Hedge whatever; and for beauty, may be said to surpass all, if neatly trained by clipping once or twice annually in summer. A Hedge of this sort is formed either by sowing the seeds at once in the place where you intend to have the hedge, in drills an inch and half deep; or by planting young plants of two or three years old from the nursery; which is rather the most eligible practice,

practice, planting them in one or two rows, though two rows planted a foot asunder, and the same in each row, will form the thickest and most effectual for an outward Hedge; but either of which will, in eight, nine, or ten years, form a good fence. For particulars in raising the plants, see ILEX.

Yew is occasionally planted as a boundary Hedge in some particular parts of a garden, and, when full grown, forms a very thick close Hedge, though not so effectually by way of a fence, as the holly, as being wholly devoid of defensive armature; and is therefore not eligible for any general outward fence in exposed situations, except where guarded by ditch or bank on the outside.

The furze plant is sometimes used for an outward ever-green Hedge fence for fields, which, however, makes but an indifferent Hedge, being apt to die off in gaps; but as it will grow upon dry banks, or any poor dry soil, where scarcely any other plant will thrive, it may on that consideration be used for a hedge; which is to be effected by sowing the seeds in autumn, at once in the place where it is designed to have the Hedge, in drills an inch and a half deep. See ULEX.

With respect to the method of planting the above kinds of Hedges, take the following hints.

All outward Hedges, designed as fences, should generally have a ditch and bank; the ditch, &c. serving as a defence to the young Hedge against cattle, &c. till it is grown up to a fencible state of itself; and afterwards renders the whole a more effectual outward fence; or if planted on level ground, should be defended with railing, open pales, hurdles, or a stake and bush dead hedge, till advanced to the above growth; so that if a ditch and bank is intended, the ditch to be on the outside, three feet wide at top, two or three deep, sloping to one wide at bottom, raising a low bank on the inside on which to plant the Hedge, which may be planted either on the side of the said inner bank, in two rows one above the other, a foot asunder, as commonly practised for quick Hedges, planting them as you advance in forming the ditch and bank, or may be planted entirely on the top of the bank, first forming the ditch and bank, and levelling the top of the bank, so as to form a sort of border or bed extending longways; then plant the sets in one or two rows, the whole length; but two rows a foot asunder, is the most eligible for all outward fences, as it always forms the thickest, strongest, and most effectual Hedge-fence; but the particular method is more fully explained below.

As the haw-thorn or white-thorn Hedges, commonly called quick or quick-set Hedges, are the most effectual and most frequently used outward Hedge-fence, we will therefore first exhibit the method of planting and forming these kind of Hedges as outer fences against cattle, &c. which, to render it more effectual, should always have a ditch and bank as above observed. The plants or sets for forming the Hedge are raised from the seed or haws, as directed under their proper genus (see CRATÆGUS *Oxyacantha*); and when from one to two or three years old, about the size of a large goose quill, or a little more or less, are proper sets for planting out to form Hedges, as observed in their propagation. Having your quick ready, then in the place where you intend to plant the Hedge, mark out a space for a ditch, three feet wide at top, as before observed; which is to be digged two or three feet deep, sloping gradually to a foot wide at bottom, forming a bank along upon the inner edge, on which to bed or plant the quick, which may either be planted as you advance in forming the ditch and bank, placed horizontally into the side of the latter, or by first forming the ditch and banking, and planted upright on the top of the bank; both methods according to the following intimations.

First by planting on the side of the bank.—Having lined out the width of the ditch, then along the inner edge lay a row of square spit-turfs grass-side downwards, to form the beginning of the bank, backing it up with spits of earth from the formation of the ditch, and top it with a little of the fine mould or crumbs, and then upon this proceed to lay the first row of quick; first let the sets be headed to about five or six inches, and the roots trimmed, then lay them upon the bed of turf, with their top-ends outward, in an upward direction, six or eight to ten or twelve inches asunder; covering their roots with mould also out of the ditch, continuing it over the stems of the plants, and backing up properly behind; then lay another stratum of spit-turfs as before, and more mould from the ditch upon and behind the turf; and when the bank is thus raised a foot above the row of sets, plant another row in the same manner, placing each set against the spaces of those of the first row, so covering them with more earth from the ditch, forming it in a flat bed over the sets, four or five inches deep; continuing the ditch to the proper depth, as above, sloping the side to one foot width at bottom, and trim up all remaining loose earth, throwing a sufficiency behind the top of the banking, to back up the whole even, in a
sets

sort of broad border, all the way along the top, either raised a little behind in a small banking order if thought requisite, or formed gradually sloping back so as to correspond nearly with the adjoining ground.

Second, by planting in the top of the bank. —When this is intended, must first form the ditch and bank wholly as above, and the sets to be planted in two rows along the top; that is, after having formed the ditch and bank, then levelling the top, forming a sort of border all along, half a yard or two feet, to a yard wide; plant the sets along the middle thereof upright, or in two rows a foot asunder, and six inches distant in each row; the mode of planting to be as hereafter directed; observing the same when intended to raise a Hedge at once from seed sown where you design the Hedge to be; sowing them along the top either in a single drill, or in two drills a foot asunder.

Sometimes when Hedges are designed for middle fences to divide fields, a two-sided bank is raised a yard high, and as broad at top, having a slight ditch on each side; and each side of the bank is formed with square spit-turfs from the adjoining ground, and the middle filled up with mould from the ditches on each side; so that, when finished, it forms a yard-wide bed all the way along the top; and along the middle of which plant two rows of Hedge-sets, or seed, in drills as before observed.

But in places where no ditch nor raised bank is required, as may be the case for middle Hedges in the more interior parts of grounds, especially in gardens, then the place for the Hedge being marked out on the level ground, two or three feet broad, dig it along, one good spade deep at least; and then plant your sets of any sort in one or two rows, ranging along the middle, as hereafter directed; or, if you design to sow seeds, &c. of any sort, at once, where you intend to have the Hedge, sow them in two drills, a foot asunder, the whole length,—though it may be observed, that for any interior garden Hedge, one row is generally sufficient, either of sets planted or seeds sown.

With respect to the mode of planting the sets or plants of any sort, for a Hedge upon level ground, either on the top of a bank levelled, or entirely upon the general level surface, where no bank is necessary, as for middle Hedges in gardens, &c. the following methods are practised,—previously observing, that if the sets are of tolerable large size and strength, it will be proper to form a trench, in which to plant each row, with the roots all a regular depth, and the tops upright; or, if quite small young sets, they might be planted with a dibble.

However, first to proceed by trench-planting. Having, in the place where the Hedge is intended, either upon the top of a bank, or on common level ground, formed a sort of level border or bed, two or three feet wide, the whole length intended, and in which proceed to form one or two narrow trenches longways, for a single or double row of sets; that is, with the spade cut out a narrow trench, six or eight inches deep, all along, for each row of plants, making one side upright, then place the sets in the trench close against the upright side, six, eight, or ten inches asunder in the row, with their tops all upright, several inches above ground; and directly turn in the earth upon the roots, &c. to the depth of the trench, as you proceed in placing them, treading the earth thereto moderately firm, to fix the plants in the proper position;—and, if intended to plant two rows of sets to form a double hedge, make another trench, a foot distance from the first, and plant the sets in the same manner and distance; generally placing those of the second trench opposite the interval spaces of the first row of sets, earthing them in regularly as the others, and tread it down close to the sets, evenly along the surface:—or in trench-planting the sets, it may be performed by planting them as you proceed in digging the trench; marking out with the spade a foot-wide trench, dig out a spade depth of earth at one end, the width of the trench, place a set therein close to one side, or if intended to have a double Hedge, place two sets, one to each side of the trench; and then, in either method, proceeding in digging, turn one or two spades of earth in upon the roots of the sets; and at eight or ten inches from these, plant one, or two sets in the same order; dig and earth them in as the others; and thus proceed digging along, planting the row of sets as you advance, the distance as above; observing, if a double row, generally place the sets opposite to the intervals in the rows of each other:—but in performing the above plantings, it would be more convenient to have two persons employed in that business, one to place the sets, the other to dig the aperture, and spade in the earth directly upon them as they are inserted.

But in planting small young sets of quick, &c. they, as before intimated, may be planted with a dibble; the ground being previously well digged a spade deep; so trimming the straggling roots and tops of the plants; and with the dibble making a hole for each set at the above distances, inserting the roots a proper depth, and close the earth well about each set, as planted.

Or when designed to form a Hedge by sowing the seeds at once in the intended place, for the plants to remain where sown, the ground being properly dug, form either one drill for a single row, or two for a double Hedge, a foot asunder; sow the seed tolerably thick; cover them an inch or two depth with the earth; and keep the place very clear from weeds, both before and after the plants appear; and if these are any-where too thick, they may be thinned out at the proper season.

In respect to the training and general culture of these sorts of Hedges, it must be remarked, that all such that are exposed to cattle, must, as soon as planted, be fenced either with a stake and bush Hedge, with hurdles, or with rails and open paling, four or five years till the hedge grows up; observing not to place the fence too close to the Hedge to interrupt its growth. The Hedge must also be duly weeded while young, and kept very well cleared from all large, overbearing weeds; and this should be particularly attended to the first two years.

And if designed to train the Hedge regular by clipping it with garden shears, it should be annually performed in summer, observing however to top it but sparingly while it is young, until arrived at its intended height, only just trim off the tops of the straggling and run-away shoots to preserve a little regularity, that the whole may advance equally, and promote lateral wood to thicken it as it advances; and cut it in moderately on the sides; but when arrived at nearly its proper height of four, five, or six feet, or more, then trim it close on the sides and top annually, to preserve it thick and within its proper bounds, cutting the sides always first as even as possible; then the top, which should also be cut as even as a line, always cutting in nearly to the old wood of the former year's cut, otherwise your Hedge will get too broad; and keep always the top narrower than the bottom.

But as to field Hedges, which are rarely clipped, they, in the course of some years' advanced growth, often run up naked, or open below; and, in which case, will want plashing or laying, to thicken them properly from the bottom upward, to answer the purpose of an effectual fence. See **PLASHING** Hedges.

In former designs for gardens, regular Hedges were in great request; almost all the different compartments and divisions of pleasure-grounds were surrounded with Hedges formed of various sorts of trees and shrubs, both ever-greens and deciduous kinds, which being neatly trained and clipped once or twice annually, appeared sometimes very orna-

mental in themselves; but as they often surrounded, and shut out from view, the various plants and trees growing in the quarters, which were infinitely more agreeable, as garden furniture, than the perpetual show of so much Hedge-work obtruding always upon the sight, which at one time so greatly prevailed by way of ornament, often bounding all the principal walks, that wheresoever one walked, close Hedges presenting ever in view on both sides, with very little variation, was, in a manner, like walking in a lane between two walls; and the more beautiful variety of the internal plantations was in a great measure lost to the sight of persons in the walks; so that Hedge-work in that general manner becoming at last disgusting, is now almost totally excluded, and discontinued in the English gardens; and Hedges are only introduced occasionally either as outward or division fences, or for shelter, shade, &c. in particular compartments; or sometimes moderately by way of ornament, in some districts of pleasure-grounds, without surrounding shrubbery and other plantation compartments as above, but in some light airy degree, or sometimes as an outward boundary, or to cover any unsightly parts internally.

Lofly elm, lime, beech, and some other sorts of deciduous Hedges for ornament in pleasure-grounds, were some years ago very prevailing, trained close from the bottom, or sometimes trimmed up open and arched below, and close above; and, in both of which, were regularly trained by annual clipping in summer, ten, twenty, or thirty feet high, or more; and tall Hedge-work of the above trees, trained to clean stems below, eight or ten feet, and Hedge-form above, were much adopted in the front of many country-seats, and contiguous to road sides; and in many places we still observe the remains, and some continued in that order of training; but the great height of all these lofty Hedges rendering them often very inconvenient, troublesome, and expensive to clip, they are now mostly discontinued, and preference given to rural growth.

Hedges likewise, in former designs in horticultural ornaments, were formed into various fancy devices; sometimes representing porticos, arches, galleries, and numerous other similar imitations, which often exhibited an air of magnificence in that order of gardening, but were as often ill-formed according to the intended design, and of a disagreeable appearance; that in the whole, the practice is now almost entirely abolished from the British gardens.

As several different sorts of trees and shrubs, both ever-greens and deciduous plants, are employed in forming garden Hedges, the principal of them are exhibited below, under the heads, Ever-green Kinds, and Deciduous Kinds.

Ever-green Kinds.

The principal ever-greens employed for Hedges are —Holly—Yew—Laurel—Laurustinus—Phillyrea—Alaternus—Bay—and Ever-green Oak; all of which will form Hedges from five or six, to ten or twelve feet high; and the last named sort, Ever-green Oak, may be led up to twenty feet; but the holly and yew form considerably the best Hedges for general use. Besides the above seven sorts for tall Hedges, sometimes also are used for lower Hedges, Ever-green Privet—Tree Box—Juniper—Virginia Cedar—Savin—Rosemary—Pyracantha—and Sea Purslane Shrub, and some other ever-greens of similar growth.

Of the above list of ever-greens for Hedges, the holly and yew form the closest and most effectual garden-hedges of any of the sorts, as they will grow so thick and close, that a bird can hardly get into them, and may be trained ten or twelve feet high, or more; though from about six to eight or nine feet is the most eligible height for these kinds of Hedges for general use: both the sorts may be easily trained to almost any form by an annual clipping, more particularly the yew; but the holly makes rather the most eligible Hedge as a fence, and also for ornament; but is singularly beautiful when the common green sorts and the variegated kinds are alternately intermixed. The yew, however, as producing the most numerous closely placed small shoots, thickly set with very small leaves, grows the closest, and is the most easily trained into any desired shape, of any Hedge in being, as is evident in some old gardens, where many of these Hedges are still retained, exhibiting the remains of the ancient taste of design in gardens; in which some are trained into common regular Hedges, and some have the hedge-work formed into various shapes and figures, as arcades, niches, cornices, porticoes, pilasters, galleries, figures of men, beasts, and birds, and many other formal works. The yew is also a very proper Hedge to plant internally in nursery grounds for shelter to young plants.

To form internal or middle Hedges of these two sorts, plant them in one row, which is sufficient, along the place where the Hedge is intended; placing the holly at about a foot or a foot and a half distance, and the yew the same; but if the latter are large spreading plants, two or three feet.

The laurel being a singularly beautiful ever-green, adorned with a noble large foliage, is sometimes planted for Hedges; but as it shoots vigorously, it never grows so compact, nor is so easily kept in form as the two fore-mentioned sorts; its leaves also being very large, when the hedge is clipped with shears, they are unavoidably cut through, and so stubbed and mangled as to have a very disagreeable appearance; therefore, instead of performing their annual training with shears, trim off the shoots with a knife, to preserve the leaves entire. This plant is also proper to train Hedge-fashion to hide any disagreeable fence, and will grow either under trees, in the shade, or in an open exposure, and is of quick growth; and to form a Hedge, may be planted in one row, at about eighteen inches to three feet distance, according to the size of the plants at the time of planting.

The laurustinus, being valuable not only as an ever-green, but as one of our most beautiful flowering shrubs, will form a delightful Hedge for ornament, as it will be covered with flowers in winter and spring; it is also excellently adapted for training hedge-fashion against any shabby fence or naked wall. Planting it, in either method, in one row, at from about eighteen inches to three feet distance.

The phillyrea and alaternus are very beautiful ever-greens for ornamental Hedges; both of which plants greatly resemble each other; but the phillyrea being the strongest grower, as well as thickest shooter, is the most eligible for a hedge; but for variety both may be used: they are also some of the best ever-green shrubs for training hedge-fashion against any unsightly or naked wall or paling fence, which they will soon cover; and if the common green and variegated kinds are intermixed, in either mode of hedge-work, they will have a delightful effect, and may be trained as detached Hedges, six or eight feet high, and against any fence ten or twelve.

Plant them in one row, at from about fifteen or eighteen inches to two or three feet distance between plant and plant.

The bay will also form a tolerable ever-green Hedge for variety, and may be led up six or seven feet high; placing the plants half a yard distance.

The ever-green oak is a proper plant to form a tall Hedge, as it may be trained fifteen or twenty feet high, if required; plant it in one row, setting the plants one, two, or three feet asunder, according to their size.

The ever-green privet will also form a handsome good Hedge five or six feet high, planting

planting the sets about a foot asunder, and train it up narrow at top.

The tree-box makes a very close and beautiful low ever-green hedge, about four or five feet high, planting them a foot asunder.

The other lesser sorts of ever-greens, mentioned in the list for ever-green Hedges, are sometimes employed for variety to form moderate Hedges, at from about three or four to five or six feet high; planting them in a row at about from twelve or eighteen inches to two feet asunder.

All the sorts of ever-greens here specified for Hedges, are raised for sale at all the nurseries, and when from about twelve or eighteen inches to two or three feet high, are of proper size for that purpose, though the holly, in particular, should generally be planted in younger growth.

The season for planting them is in autumn or in spring; for it is not safe to transplant ever-greens in the middle of winter.

With respect to the mode of planting all the above sorts of ever-greens, for middle or internal Hedges,—no ditch nor bank is necessary, as for outward Hedges for fences; so that, in the place where the Hedge is designed, mark out a sort of border the whole length, two or three feet wide, and dig or trench it all the way along, for the reception of the plants: the plants need only be planted in a single row; observing, that if the plants are small, and that you would have them meet and form a hedge as soon as possible, you may plant them at from about a foot to fifteen or eighteen inches asunder; but if the plants are two or three feet high, and proportionably spreading, from about eighteen inches to two or three feet may be a proper distance; and as to the method of planting, if they are small plants, they may be planted in trenches as directed in planting Hedges for fences; but if large plants with spreading roots, they may either be trenched in as you proceed in digging the ground, or holed in, plant and plant; the opening of one hole fills up that immediately before it, about the roots of the plant placed therein; and so proceed, hole and hole, to the end, placing all the plants upright, at regular distances, tread the earth close about their roots, and make their heads range evenly.

Deciduous Kinds.

The proper deciduous trees and shrubs for internal Hedges in gardens, besides the sorts already treated of for outward Hedges, are, Hornbeam—Beech—Elm—Lime-tree—Alder—Lombardy Poplar; all of which are proper either for middling or tall hedges, as

they may be trained up from about six or eight, to fifteen or twenty feet high; and the elm to double that height, if required. Privet is also sometimes used for moderate Hedges. And for low Hedges, the Rose—Sweet-briar—Honeysuckle—Syringa—Berberry, and several other low-growing deciduous shrubs, for variety.

The hornbeam forms one of the most beautiful summer Hedges of the deciduous tribe, it being a moderate but very close shooter, well furnished with leaves; and may be trained up from about six or eight, to twelve or fifteen feet high; but the leaves, although they wither in autumn, remaining firmly attached to the branches all winter, make but a shabby appearance during that season: it is, however, a fine Hedge; and the singularity of its retaining its withered leaves in winter renders it superior to most other deciduous Hedges for the purpose of forming shelter in the winter time (see *CARPINUS*). Plant it for a Hedge in a single row, at about half a yard asunder, if required to form a close moderate Hedge as soon as possible; but if you design to lead up the Hedge pretty tall, and if the plants are spreading, set them about three feet distance.

The beech also forms a very close regular Hedge, from about six or eight, to fifteen or twenty feet high: the leaves withering on the branches in autumn, continue dropping off most part of the winter. Plant it as directed above for the *HORNBEAM*.

The elm will form a very close, even, and beautiful Hedge, provided the upright English elm is planted, it being the properest of all elms for this purpose; and may be trained from six or eight, to ten, twenty, or thirty feet high, forming a close Hedge from the very bottom to top; the plants for this purpose may be three or four to eight or ten feet or more, and planted in a single row two or three to six or eight feet distance, according as they are less or more spreading, and as may be required to form a close Hedge as soon as possible, or to advance to that state in a gradual growth; but when required to form a close middling Hedge as soon as possible, you may set the plants but two feet or a yard asunder; and if intended for a moderate tall Hedge, plant them three or four feet apart in the row; and if designed to have a Hedge of considerable height, place the plants five or six feet distance at least, especially if large spreading ones; as, if the plants of a very tall Hedge stand too close, they are apt to get naked at bottom.

The lime-tree is sometimes employed for ornamental Hedges for variety, but is much inferior

inferior to any of the other deciduous kinds, as it becomes thin and shabby by clipping, and is thinly leaved; which also begin to fall off very early in autumn.

The alder, as it delights in moist soils, and watery places, is sometimes planted for Hedges in low moist parts of extensive pleasure-grounds, &c. where other trees will not prosper, and makes a handsome Hedge, from about six or eight, to twelve or fifteen feet high, retaining its leaves late in autumn, and continuing a fine green to the very last. See *BETULA ALNUS*.

Privet is frequently planted for Hedges, as it grows exceedingly close, may be trained up five or six feet high, and will grow any-where, either in an open exposure, or in the shade, or under trees, and even in the midst of great cities, and soon grows up.

The Lombardy Poplar, before mentioned, is sometimes trained in the Hedge order, but rather by way of shelter, shade, or blind, as formerly observed, or occasionally as an internal division Hedge in large grounds, than as an outward boundary Hedge, except principally on the above occasions, but not so eligible as a fence.

As to the other low kinds of shrubs mentioned in the list of deciduous garden Hedges, they are sometimes employed for variety; and some sorts, such as roses, honeysuckles, and syringa, formed into low Hedges, will, besides their property as Hedges, produce vast quantities of flowers.

With respect to the method of forming all these kinds of deciduous Hedges, the plants for that purpose are all raised as directed under each respective genus, or may be had from the nurseries; and when from about one foot to a yard or more high, according to the sorts, are of a proper size for that purpose; for it is eligible to plant them young, choosing such as are well furnished all the way with plenty of side or lateral shoots, that they may form a close Hedge quite from the bottom; and all of which may be planted any time from October till March, in open weather.

As to the method of planting, nearly the same is to be observed as directed for the ever-green kinds.

Of Training the above different Sorts of Hedges.

As to the method of training the Hedges, both ever-green and deciduous kinds, they, while young, must be but sparingly topped, till they arrive at their intended height: cutting each side, however, moderately every summer with garden shears, to train them in the proper form, and cause them to throw out plenty of lateral wood to thicken; but as

to the top, only just trim the long running shoots a little even, and to promote their emitting laterals below to thicken gradually as they advance in height; and as some plants will advance considerably faster in height than others, let those be trimmed within the bounds of regularity, which is all that should be done till the Hedge has attained nearly its designed height: observing, in training up the different Hedges, to keep the top gradually a little narrower than the bottom; but more particularly those of the most pliant growth, especially some of the ever-green kinds; otherwise, when broad at top, they catch much snow in winter, the weight of which would break the more pliant sorts much out of form.

All full-trained Hedges, in order to preserve them in proper form, close and neat, must be clipped, both on the sides and top, once or twice a year, but never less than once; and the best time of the year for this work is summer, from about the middle or latter end of June to the end of August; for then the Hedges will have made their summer shoots, which should always, if possible, be clipped the same season while in leaf, and before the shoots become hard, whereby you will be able to perform the work more expeditiously, and with greater exactness; for regular Hedges should be cut as even as a wall on the sides, and the top as straight as a line: observing, after the hedge is formed to its proper height and width, always cut each year's clipping nearly to the old cut of the former year, particularly on the sides; for by no means suffer them to grow above a foot wide at top, nor suffer them to advance upon you too much upward, where it is designed or necessary to keep them to a moderate height.

But to keep Hedges in perfect good order, they should be clipped twice every summer: the first clipping to be about Midsummer, or soon after, when they will have made their summer shoot; and as they will shoot again, what may be called the autumn shoot, the second clipping is necessary towards the middle or latter end of August, and they will not shoot again that year.

However, when it does not suit to clip them but once in the summer, the clipping should not be performed until the beginning of August; for if cut sooner, they will shoot again, and appear almost as rough the remainder of the summer, and all winter, as if they had not been clipped at all.

Very high Hedges are both troublesome and expensive to cut. The clipping is sometimes performed by the assistance of a high machine.

machine-scaffolding, or stage, twenty or thirty feet high, or more, having platforms at different heights for the men to stand upon, the whole made to move along upon wheels: it is composed of four long poles for uprights, well framed together, eight or ten feet wide at bottom, narrowing gradually to four or five at top, having a platform or stage at every seven or eight feet height, and one near the top; and upon these the men stand to work, each platform having a rail waist-high: a sort of a ladder formed on one side for the men to ascend, &c. and at bottom four low wheels to move it along: upon this machine a man or two may be employed on each stage or platform, trimming the Hedge with shears, and sometimes with a light garden hedge-bill fixed on a handle three to five or six feet long, which is more expeditious, though it will not make so neat work as cutting with shears; so, as they proceed in cutting, the machine is moved along upon its wheels. But sometimes, instead of the above machine, high clipping is performed with light spring or balance-shears: i. e. shears without handles, fixed nearly horizontal upon the end of a long pole, six, eight, or ten feet long, and which is made to fix into another occasionally, by means of iron rings, and this into a third, &c. according as you advance in height with the clipping; so that the shears, by means either of a spring, or by a knob of iron forged to the back of the lower blade for a weight, open of themselves at each stroke or cut, having a long string reaching from a small bent iron handle of the shears, all the way down the sides of the poles through small rings; and by holding the pole in one hand, resting the lower end on the knee or foot, and pulling the string, the shears are struck close, so as to cut the shoots of the Hedge; and at each stroke the shears open again, ready for another: this however is very tedious, as well as tiresome to the workman, and only the sides of the Hedge can be thus trimmed; but these very high hedge-works, on account of the great trouble of clipping, and the preference given to rural growth, are become in disrepute; and, in most places, the trees which formed them are suffered to grow in an open natural way.

HEDYSARUM, French Honeyfuckle.

The plants are principally of the herbaceous tribe, and there are many species, hardy biennials and perennials of the flowery race, producing stalks two or three feet high, adorned with pinnated and trifoliate leaves, and papilionaceous flowers in long spikes.

Class and order, *Diadelphia Decandria*.

Characters.] CALYX is monophyllous and half five-parted. COROLLA is papilionaceous, of four petals; an oblong-oval, compressed, emarginated, reflexed vexillum; two oblong, narrow, erect wings, and an obtuse carina, bifid at the base. STAMINA, ten diadelphous filaments, and roundish antheræ. PISTILLUM, a small narrow germen, awl-shaped, reflexed style, and single stigma. PERICARPIUM, a jointed pod, each articulation containing one reniform seed.

The species commonly cultivated in our gardens are,

1. HEDYSARUM coronarium.

*Coronate, or garland-flowered Hedysarum—*or *Common French Honeyfuckle.*] Hath large, deeply-striking, biennial roots; upright, hollow, smooth, very branchy stalks, three or four feet high, garnished with pinnated leaves, of five or six pair of foliola, terminated by an odd one; and from the places of the leaves, long spikes of beautiful red flowers, succeeded by jointed seed-pods.

Variety.] With white flowers.—Both these varieties are biennial, rising one year from seed, produce flowers the next, and then perish.

2. HEDYSARUM canadense.

Canadian perennial Hedysarum.] Hath long, deeply-penetrating, perennial roots, crowned with simple radical leaves, slender stalks two feet high, garnished with trifoliate or three-lobed leaves, and long loose spikes of flowers from the sides and ends of the branches, succeeded by jointed triangular seed-pods.

Varieties.] Canadian hedysarum with red flowers—with white flowers—and with purple flowers.

HEDYSARUM obscurum.

Creeping-rooted Hedysarum.] Hath hardy perennial creeping roots, from which arise the stalks about a foot high, furnished with winged leaves, consisting of six or eight pair of folioles, and terminating with spikes of pendulous flowers of a rich purple colour.

4. HEDYSARUM gyrans.

Sensitive Hedysarum.] Hath a biennial branching stem, about three feet high, garnished with blunt, ternate, oval-spear-shaped leaves, and very small lateral ones, and terminated with spikes of yellow flowers.

It is remarkable of this plant, when the weather is still and warm, the small lateral leaves are in continual motion in all manner of directions.

These species of *Hedysarum* and respective varieties flower in June and July, are exceedingly floriferous, particularly the biennial sort, and are all productive of plenty of ripe seed

in autumn, from which all the sorts may be raised abundantly in the common ground.

The first species and variety are biennials, and very ornamental plants for large borders, and to intermix in the shrubby compartments, allowing them room, for they branch out greatly every way, producing a vast profusion of flowers; observing, as both the varieties are biennial, a supply must be raised annually from seed.

The second and third sorts and varieties are perennial in root, but annual in stalk: they are proper ornaments for large flower borders, and to interperse in the shrubbery clumps: allow them a dryish soil.

The fourth sort is biennial, but being tender requires a green-house for its protection.

Propagation, &c.

All the sorts are propagated by seed, sown in March or April, in a bed or border of common earth, for transplantation.

Sow each sort separate, either in drills half an inch deep, or on the surface, and rake them in. When the plants are come up two or three inches high, prick them out into another bed or border, six inches asunder, giving water directly, and repeat it as occasion requires, till they have taken root, and begin to grow: here let them stand till October; then transplant them into the places where they are to remain to flower, which they will effect the following summer.

Observe that as the biennial sorts either perish soon after flowering, or become dwindling, a fresh supply must be raised from seed every spring; but the perennial sort being abiding in root, sends up new flower-stalks annually.

HELIANTHUS, Sun-flower.

This genus comprises several hardy, herbaceous, flowery annuals and perennials, and an esculent root; most of them rising with upright, strong stalks, several feet high, adorned with large simple leaves, and terminated by large compound radiated flowers.

Class and order, *Syngenesia Polygamia Superflua*.

Characters.] CALYX is composed of many oblong, imbricated leaves, broad at their base, and pointed at the top. COROLLA is a compound, radiated flower, having numerous tubular, hermaphrodite, fruitful florets in the disk, and the border or radius composed of long, flat, female, barren florets. STAMINA, five crooked filaments in each hermaphrodite floret, and tubulous anthers. PISTILLUM, in the hermaphrodites, an oblong, slender style, and reflexed stigma. PERICARPUM, none; an oblong, four-cor-

nered seed succeeds each hermaphrodite floret, resting on the general receptacle.

This genus comprises—The Annual Sun-flower—Perennial Sun-flowers—and the Jerusalem Artichoke.

The species principally cultivated in our gardens are,

1. *HELIANTHUS annuus.*

Annual Sun-flower.] Hath large, fibrous roots; an upright, strong stalk, rising from about half a yard to ten or twelve feet high, branchy near the top, garnished with large, oblong, heart-formed, trinervous leaves; and the main stem and every branch terminated by one large, radiated, yellow flower, nodding a little downward.

Varieties.] Giant Sun-flower, growing from about five or six to ten or twelve feet high—Dwarf Sun-flower, growing from about half a yard to a yard high; and of each variety there are singles and doubles, with deep-yellow flowers, and with sulphur-coloured flowers: the doubles of each sort are very beautiful, and are rendered double by the radius (see *COMPOSITUS fls*). They all flower in July, August, and September.

2. *HELIANTHUS multiflorus.*

Many-flowered Common Perennial Sun-flower.] Helianthus with fibrous, perennial roots, many upright stalks, branching numerous three or four feet high, garnished with heart-shaped leaves below, and oval above; and all the stalks, branches, and side shoots, terminated by largish bright-yellow flowers.

Varieties.] Single-flowered perennial Sun-flower—Double perennial Sun-flower, rendered double by the radius.

This species is the common perennial Sun-flower, sometimes called Everlasting Sun-flower; a very floriferous plant, continuing a constant succession of bloom from July until November; the double-flowered variety is the most valuable; the flowers being perfectly full, and doubled to the very centre.

3. *HELIANTHUS decapetalus.*

Ten-petaled Perennial Sun-flower.] Produces many stalks three or four feet high, spear-shaped leaves, and yellow flowers, having but ten petals in the radius.

4. *HELIANTHUS giganteus.*

Giant Perennial Sun-flower.] Produces many erect stalks, eight or ten feet high, spear-shaped, alternate leaves, rough and ciliated at the base, and many single yellow flowers; having about twenty petals in the radius.

5. *HELIANTHUS atrorubens.*

Dark Red-disked Perennial Sun-flower.] Produces several stalks three or four feet high, garnished with oval, crenated, trinervous leaves,

leaves, and flowers having dark-red middles, and the calycinal scales erect.

6. *HELIANTHUS divaricatus*.

Divaricated-forking Perennial Sun-flower.]

Stems six or seven feet high, ovate-oblong, three-nerved leaves, opposite, sessile, and branching, two-forked panicles of flowers.

7. *HELIANTHUS angustifolius*.

Narrow-leaved Perennial Sun-flower.] Stems upright, leaves narrow, linear.

8. *HELIANTHUS laevis*.

Smooth Perennial Sun-flower.] With tall, smooth stems; leaves lance-shaped, three-nerved, sawed, smooth, opposite.

9. *HELIANTHUS tuberosus*.

Tuberous-rooted Perennial Sun-flower, commonly called Jerusalem Artichoke.] Hath a large, tuberous, knobbed, irregular, eatable root like a potatoe, productive of many similar tubers; upright stalks, six or eight feet high; large, oval-cordate, triple-nerved leaves, and the stalks terminated by smallish yellowish flowers.

The flowers of all these species are of the compound radiated kind; many tubular florets compose the disk, and long flat ones the radius or circumference, and which, in the annual sort in particular, is succeeded by abundance of fine large seed in autumn, occupying the whole disk, or middle of the flower; for the female florets in the radius being imperfect, are never followed by seeds (see the *Characters*). The name Sun-flower is chiefly derived from the annual sort, which is said to be given, because the flower obeys the motion of the sun, turning with its face always thereto, but more probably from the resemblance of its rays to the figure of the radiant beams of that planet.

All the sorts, except the last, have fibrous roots, and by which the perennial sorts multiply greatly; but the sixth sort hath a knobby, fleshy root, which also multiplies exceedingly, so as often to become troublesome like a weed: the annual sorts are but of few months' duration; but the perennials are of great duration in root, but annual in stalk.

They are all originally of America, but have been long in our gardens, especially the first, second, and ninth species, and are all so hardy as to grow here in any soil and exposure.

They are proper ornamental furniture for the common compartments of the pleasure-ground, arranging them rather backward, among the taller classes, where they will effect a good variety with their bloom, in one or other of them, from July until November.

The annual sorts are stately, majestic plants,

of amazing quick growth, as some of the giant sorts will sometimes, in a strong, rich soil, arrive at ten or twelve feet height in four months, and produce flowers from ten or twelve to eighteen inches diameter, and make a noble appearance, especially the full double kinds. But the dwarf kinds being rather remarkable for having the most doubles, and these generally more double than the giant sorts, they are the most esteemed for general culture, and are more particularly adapted for small gardens; though in large gardens some of each sort is proper: and both varieties, if growing separate, remain tolerably permanent, as the seed of each will produce plants of the same sort again.

These fine plants are of no more than about five or six months' duration, being raised from seed in spring, arrive at full growth in July and August, and die wholly in October or November; so that a fresh supply must be raised every spring.

All the perennials are of great duration in root; but their stalks decay in autumn, and new ones rise in spring.

Of the perennial sorts, the *Helianthus multiflorus* has considerably the greatest merit for ornament, the flowers being larger and more numerous than any of the others, and very double, and is the most commonly cultivated; but the other sorts are proper to be admitted in a collection, to increase the variety. All of which may be had at most of the nurseries; but the *Helianthus tuberosus* should be but sparingly admitted in compartments amongst other plants, for its roots will multiply so greatly, as soon to over-run the ground.

The *Helianthus tuberosus* is by many esteemed for its root to eat, which is large, solid, and fleshy, somewhat resembling a potatoe, and sometimes as large, but much more knobbed and irregular, and greatly inferior to that root as an esculent, it being rather of a watery and insipid nature, though some are remarkably fond of them: they are commonly boiled and served up with plenty of butter.

This sort is commonly called Jerusalem Artichoke, though with very little propriety, for the plant grows no where naturally about Jerusalem, nor is it in the least allied in any respect to the *Cynara*, or artichoke.

Propagation, &c.

The propagation of all the sorts is very easy; the first species and varieties by seed, and all the others by roots.

The first species, therefore, and varieties, are raised from seed, sown annually in March or April, either in the borders, or other places where

where you design they shall flower, in patches, three or four seeds in each, about an inch deep; and when the plants are an inch or two high, thin out the worst, leaving only one of the best plants in each patch; or sow them thin in a bed or border, and when the plants are two or three inches high, transplant them, in moist weather, where they are finally to remain; or if you would bring them as forward into bloom as possible, the seed may be sown on a moderate hot-bed under a hand-glass, giving plenty of air in mild weather, and plant them out in May.

The perennial kinds are propagated plentifully by dividing the roots, any time from October or November, till March: the four fibrous-rooted sorts may be slipped into small heads, and planted at once where they are to remain; they will flower the following summer, and will be increased greatly by autumn: and as to the tuberous-rooted kind, the large roots may either be divided into pieces, or plant the small roots: every bit having an eye will readily grow, and multiply greatly in one year.

But when designed to raise the tuberous *Helianthus*, or Jerusalem Artichoke, as an esculent, it should be planted in an open spot of light ground in the kitchen-garden. In spring, having procured some large roots, they may be cut into four or more pieces, each making a set or plant; or, in default of large ones, may use small ones whole. They are to be planted with a dibble, in rows three feet and a half asunder, planting them four or five inches deep, and half a yard distance in each row; and, when planted, rake the ground even; and keep it clean from weeds by broad hoeing. The plants will come up in April or May, and shoot up into stalk, six or eight feet high, which, in August, may be cut down half way, the better to admit the benefit of the air, rains, and dews to the roots, to increase their bulk.

They will be fully grown by September, when some may be taken up for use; and about the end of that month, or in October, take them wholly out of the ground, or as many as thought necessary, and lay them in sand in a dry place, for winter service.

HELICONIA, Bastard Plantain.

Consists of tall-growing, herbaceous perennials, for the stove collection; rising to a considerable height, with very large leaves, and spathaceous flowers.

Class and order, *Pentandria Monogynia*.

Characters.] CALYX, an universal and partial spatha, but no proper cup. COROLLA, three oblong, erect, pointed, channeled pe-

tals, with a diphyllous, unequal nectarium. STAMINA, five slender filaments, topped with long, erect antheræ. PISTILLUM, an oblong germen below the flower, style shorter than the stamina, crowned with a long curved stigma. PERICARPIMUM, an oblong, truncated, three-sided capsule, with three cells, each containing an oblong seed.

There are two or three species of this genus, one of which comes within our notice, viz.

HELICONIA Bihai.

(*Bihai*)—or *Bastard Wild Plantain*.] Rises with an upright, soft stem fifteen or twenty feet high, with oblong, nerved, and netted leaves, narrowed at their base, and near three yards long and one broad; an erect spadix of scarlet flowers, having a persistent spatha, succeeded by large clusters of fruit.

Varieties.] With dark flowers—With variegated flowers.

These plants being natives of the hot parts of America, require the protection of the stove; but as they grow very tall, and the leaves exceeding large, much room will be required; they must be potted in large pots of rich mould, and kept constantly plunged in the bark-bed, giving them plenty of water in summer.

Their propagation is by suckers arising from the root, particularly after having fruited, which may be taken off any time in summer, with fibres to them, planted in pots, and plunged in the bark-bed where they will readily grow, and afterwards shifted into larger pots as they advance in height.

HELICTERES, the Screw tree.

A shrubby exotic for the stove, ornamented with heart-shaped leaves and decandrious flowers.

Class and order, *Decandria Monogynia*.

Characters.] CALYX is monophyllous, and unequally five-parted at top. COROLLA, five oblong petals fixed to the receptacle, with five petal-formed nectariums. STAMINA, five or ten very short filaments, topped with oblong, lateral antheræ. PISTILLUM, a very long, recurved, slender receptacle growing on the top of an oval germen. PERICARPIMUM, five spiral, intorted capsules with one cell, containing many angular seeds.

The species for our notice is,

HELICTERES Ifora.

(*Ifora*)—or *Great-fruited Helicteres* or *Screw-tree*.] Hath a shrubby stem rising five or six feet high, with several branches covered with down; garnished with heart-shaped, saw-ed leaves four inches long and two and a half broad, standing on long foot-stalks, and their underside woolly. The flowers are white, and come out on slender, jointed foot-stalks at the upper

upper part of the branches; these are succeeded by a taper germen, composed of five capsules closely twisted over each other like a screw, containing many seeds.

The propagation of this plant is by seeds sown on a hot-bed in the spring; and when the plants are fit to remove, may each be planted in a separate pot and plunged in the bark-bed, shading them till new rooted; they afterwards must be managed as other tender shrubs from the hot climates.

HELIOTROPIUM, *Heliotrope*, or *Turnsole*.

This genus comprises a few herbaceous annuals, and some shrubby plants, all tender exotics; one of the latter is cultivated here as a green-house shrub.

Class and order, *Pentandria Monogynia*.

Characters.] CALYX is monophyllous, and five-parted at top. COROLLA, is monopetalous, divided into five unequal parts. STAMINA, five filaments, and small antheræ. PISTILLUM, four germina, slender style, and notched stigma. PERICARPIUM, none; oval seeds lodged in the calyx.

The species chiefly cultivated here is,

HELIOTROPIUM *peruvianum*.

Peruvian Sweet-scented Heliotrope.] Hath a shrubby stalk, branching numerously four or five feet high, spear-shaped, oval, rough, veined, hairy leaves, about three inches long, and one broad, placed sparsely; and from the ends of the branches, numerous clustered spikes of pale-blue, sweet-scented flowers, appearing great part of the year, and succeeded by ripe seeds in autumn.

This plant must be always kept in pots to move into the green-house in winter; and must be potted in any light rich garden-earth.

It is propagated easily by seed, and cuttings of its young shoots.

By Seed.—This ripens here; sow it in pots of light earth in spring, and plunge them in a hot-bed; and when the plants are two or three inches high, plant them in separate small pots, plunging them also in a hot-bed to strike; then inure them gradually to the full air.

By Cuttings.—Plant small cuttings of the young shoots in spring or summer in pots; and if plunged in a moderate hot-bed, will sooner take root.

HELLEBORUS, *Hellebore*, or *Bear's-foot*, &c.

This genus retains a few hardy, herbaceous perennials, for ornament and medical purposes, obtaining in stature, some not more than three or four inches, others from one

to two feet, adorned with many-lobed, and hand-shaped leaves, and pentapetalous flowers.

Class and order, *Polyandria Polygynia*.

Characters.] CALYX, none. COROLLA, five large roundish petals, and many small nectaria placed circularly. STAMINA, numerous filaments, and compressed, erect antheræ. PISTILLUM, several compressed germina, awl-shaped styles, and thick stigmas. PERICARPIUM, several bicarinated capsules, having the lower carinas shortest and the upper convex, and many round seeds.

This genus comprises—The True Black Hellebore, or Christmas Rose—Winter Aconite—Wild Black Hellebore, or Bear's-foot, &c.

The species are,

1. **HELLEBORUS** *niger*.

Black Hellebore, commonly called Christmas Rose.] Helleborus with a black root composed of many thick, fleshy, spreading fibres, crowned by a large cluster of lobed leaves, consisting each of seven or eight obtuse, fleshy lobes, united to one foot-stalk; and between the leaves several thick, fleshy flower-stalks three or four inches high, surmounted by large beautiful white flowers of five large roundish petals, and numerous filaments, appearing in winter, about or soon after Christmas.

This is the true black-rooted Hellebore of the ancients; the root is used in medicine, and is a strong purgative.

2. **HELLEBORUS** *hyemalis*.

Winter-flowering lowest Dwarf Hellebore, commonly called Winter Aconite.] Hath a small, bulbous-tuberous root, sending up small foot-stalks two inches high, each supporting one leaf, divided into many parts, and small golden-yellow flowers sitting in the bosom of the leaves; appearing in January or February.

3. **HELLEBORUS** *fætidus*.

Stinking Great Hellebore, or Bear's-foot.] Hath large fibrous roots, upright smooth stalks dividing into bushy heads, and branching two feet high, garnished with large, pedated, dark-green leaves, of about nine long, narrow, serrated folioles, ending in acute points, and at the ends of all the branches numerous greenish flowers tipped with purple; appearing early in winter, and succeeded by plenty of seeds in the spring.

4. **HELLEBORUS** *viridis*.

Green-flowered Black Hellebore, or Bear's-foot.] Hath thick fibrous roots, crowned with large, digitate or fingered, dark-green leaves, of nine long, narrow, serrated lobes; upright, firm stalks a foot high, garnished with smaller leaves;

leaves; and from the top many green flowers intermixed also with leaves; appearing in January and February, succeeded by plenty of seed in May.

All these four species are hardy, herbaceous perennials, of which the third and fourth sorts remain bushy and green the year round, more particularly the third; and all the sorts are so hardy as to succeed in any common soil of a garden: the first should rather have a warm situation; but all the others will prosper any where, and the third and fourth either in an exposed situation, or under the shade of trees; so are proper to mix in shrubberies and wilderness quarters.

The flowers of all the sorts are composed of five roundish petals, and numerous filaments; those of the *Helleborus niger* are considerably the largest and most beautiful of all the sorts.

All the species may be employed as plants of ornament to adorn the flower borders, and other parts of the pleasure-ground.

The first sort, *Helleborus niger*, possesses great merit, both for the singularity of its profusion of bloom in winter, or early in spring, and for the great beauty of its flower, which being large, and bearing some resemblance to a single white rose, and appearing often about Christmas time, derived the appellation of Christmas Rose: it prospers in the open borders, or may be planted in pots, to move when in bloom to adorn any particular place; observing, it always flowers fairest and the most abundantly in the front of a warm sunny border. The plants may be transplanted, and the roots divided for propagation, in autumn, i. e. September, October, or November; but the sooner in autumn it is done, the stronger they will flower at their proper season towards spring; or they may be removed in spring, after they have done flowering.

Its propagation is effected commonly by parting the roots; also by seed, when they ripen, which happens but seldom in this country.

But as being a fibrous-rooted perennial, increasing in root by off-sets or slips, its propagation is easily effected by dividing the root into slips in autumn, or in spring, after the flower is past, not too small, planting them in a sheltered border, and they will flower at their proper season.

The second sort, *Helleborus hyemalis*, or Winter Aconite, is esteemed for its early bloom, which, though a diminutive plant, almost the smallest of the bulbous-tuberous-rooted tribe, yet it exhibits its golden flowers very

ornamentally, early in spring, when few others are to be seen; and is a very proper plant to adorn the edges of borders, and other flower compartments, in assemblage with snow-drops, &c. placing them in patches alternately, several roots in each patch; otherwise, as the plants being small and near the ground, if not planted in clusters, they will not make any considerable show: plant, therefore, five or six roots at least in each patch of four or five inches diameter, putting them about two inches deep; where they may remain undisturbed three years, or till increased into large bunches, then taken up and separated.

The roots being of the bulbous-tuberous kind, may be transplanted when their leaves decay, from June till October; and they increase fast by off-sets like other bulbs; which may be taken up and separated every two, three, or four years, for propagation.

The third and fourth species being large, bushy, ever-green, very hardy perennials, particularly the *Helleborus fœtidus*, flowering in the midst of winter, and early in spring in any weather, effect a good variety at all seasons; but although the flowers are not elegant, yet the plants appearing always green, of a robust aspect, and flowering at a time of the year when hardly any others appear in the open air, renders them proper ornaments for large borders, particularly in shrubbery and wilderness plantations, as they will prosper between shrubs, and under the shade of trees, &c. they being natives of woods in several parts of England, and may be raised in great plenty from seed; and from scattered or self-sown seeds, many young plants will rise.

Both these sorts are propagated by seed sown as soon as ripe, or any time from March till September, though spring is the best season. The seed may be had of all the nursery and seedsmen. Sow it in beds of common earth, and rake it in; and when the plants are three inches high, plant them out in beds a foot apart; and after having two or three months' growth there, transplant those intended for ornament where they are to remain; but those raised for medical use may remain in the beds.

These plants may be removed either in spring or autumn, or even in winter, as they will readily rise with balls about their roots.

HELONIAS (*Helonias*).

A genus, furnishing for our purpose two species of hardy, herbaceous, very ornamental-flowering perennials, producing upright annual stalks two feet high; spear-shaped, and linear leaves; and the stalks terminated by
spike

spikes and racems of many small, hexapetalous, white, and cream-coloured flowers; having no calyx, a corolla of six petals, containing six stamina, and three styles, succeeded by seed-capsules of three cells.

Class and order, *Hexandria Trigynia*.

The species are,

1. *HELONIAS bullata*.

Bullated, or Studded-flowered Helonias.]

With upright, herbaceous stalks; spear-shaped, nervous leaves; and terminal spikes of flowers.

2. *HELONIAS asphodeloides*.

Asphodel-flowered Helonias.] With upright, herbaceous stalks; the stalk leaves linear bristly; and terminal racemous spikes of white-cream-coloured flowers, very elegant.

Both these species of *Helonias* merit places in all principal gardens as flowering plants; they producing their spikes and racems of flowers very ornamental in summer; and highly deserve a situation in the most conspicuous flower compartments; in which they may be planted in spring or autumn.

They are propagated by off-sets, &c. in autumn or spring; and they may also be raised from seeds, sown in March or April in a bed or border of common light earth; and the plants, when of proper growth, transplanted.

These plants are originally natives of North America, but have been long residents of the English gardens; though their seeds are often imported here from that country along with many others of American growth which are not always produced in these parts.

HEMEROCALLIS, Day-Lily, or Lily-Asphodel.

Two herbaceous flowery perennials for the pleasure-ground; producing very long, narrow, radical leaves, and naked annual stalks two to three or four feet high, adorned at top with large, liliaceous, six-parted, yellow and red flowers.

Class and order, *Hexandria Monogynia*.

Characters.] **CALYX**, none. **COROLLA** is an infundibuliform, campanulated petal, with a short tube, and the limb deeply cut into six parts, which are spreading and reflexed. **STAMINA**, six awl-shaped, declinated filaments, and long, incumbent antheræ. **PISTILLUM**, a roundish, sulcated germen, filiform style, and three-cornered stigma. **PERICARPIUM**, an oval, trigonal, trilobous, trilocular capsule, and numerous roundish seeds.

The species are,

1. *HEMEROCALLIS flava*.

Yellow Day-Lily.] *Hemerocallis* with strong, fleshy, fibrous roots, furnished with

oblong, yellowish tubers; sending up keel-shaped hollow leaves two feet long; upright, leafless, firm stalks two feet high, dividing at top into several foot-stalks, each terminated by one large, liliaceous, light-yellow flower, of an agreeable odour.

Variety.] Small yellow Day-Lily (*Hemerocallis minor*).

2. *HEMEROCALLIS fulva*.

Flame-coloured Day-Lily.] Hath roots composed of strong, fleshy fibres, and large oblong tubers; radical, keel-shaped, hollowed, pointed leaves, a yard long, reflexed at top; and upright, thick, leafless stalks, three or four feet high, dividing at top into branches, terminated by large fulvous, or tawny-reddish-coloured, liliaceous flowers, having large, long stamina, charged with fulvous-coloured farina, which being touched or smelled to, is discharged in great plenty over the hands or face.

Both these species are very hardy, are originally of Siberia and China, but have been long in our gardens; succeed any where, and multiply at a great rate by their spreading roots; which are perennial, but annual in leaf and stalk: they derive the name, Day-Lily, from the diurnal duration of their flowers, and by being succeeded by new ones daily on the same plants for a fortnight or three weeks.

The flowers are of the Lily form, each of one petal, deeply cut into six parts. See the *Characters*.

They both flower in June, and ripen seeds in August.

Both the sorts are proper furniture for large borders, and other compartments of the pleasure-garden, and may be planted in autumn, or any time in open weather, from September till March.

Their propagation is effected abundantly by parting the roots; for they increase greatly by off-sets, which may be divided in autumn, or almost any time after flowering, or before they begin to shoot in spring; and each slip will flower at the proper season.

They may also be raised from seeds, sown soon after they are ripe, in a bed of common earth, and raked in: the plants will come up in spring following; prick them out in nursery-beds in summer, and some of the strongest will flower the second year.

HEPATICA, Noble Liverwort, now a species of *Anemone*. See *ANEMONE Hepatica*.

HERBA, an Herb. All vegetables which rise with leaves and stalks annually from the root, the stalks not becoming woody and durable, are properly considered as Herbs; such,

for instance, are many of the kitchen-garden esculents, and medical plants; and a vast train of the ornamental or flowery tribe may also come under that denomination. See HERBACEOUS PLANTS.

But many of the under-shrubby esculent and medical plants are also sometimes considered as Herbs; such as sage, thyme, rue, hyssop, winter-savory, lavender, &c. but these having ligneous, durable stalks and branches, are more allied to the shrubby tribe, so are properly of the under-shrubby kind. See SUFFRUTICOSUS.

HERBACEA Planta. An Herbaceous plant, or vegetable of an herb-like nature.

All vegetable that produce leaves and stalks annually from the root, and whose stalks or stems remain green and succulent, or soft, not becoming woody, nor durable, but die down to the root every year, soon after they have produced flowers, &c. are properly Herbaceous Plants; and of which there are annuals, biennials, and perennials. Annuals are such which perish, stem, root and all, at the end of the year: biennials subsist but two years in many sorts, generally perishing soon after they have flowered; or some continuing longer, become mostly of dwindling growth:—perennials are of many years' duration, perpetuated by their roots, which produce new stems every year for the purpose of producing flowers and seed.

So that Herbaceous vegetables are very distinguishable from the woody kinds, such as trees, shrubs, and under-shrubs, whose stems and branches are woody or ligneous, and durable; and the stalks of the Herbaceous tribe perish annually, or at least as soon as they have flowered, and perfected their seeds; and the same individual stalk never lives to flower again, but dies in autumn; and in annuals and biennials, root and all; but perennials, surviving by the root, send up fresh stalks in spring.

Of the Herbaceous tribe are most of the esculents of the kitchen-garden, except those of the under-shrubby kinds, such as sage, thyme, hyssop, &c. vast numbers of the medical plants are also Herbaceous; and of the flowery kinds for the pleasure-garden, almost all the annuals and biennials are herbaceous; as also all the perennials, both the fibrous, bulbous, and tuberous-rooted kinds, whose stalks decay annually, are likewise Herbaceous Plants. Therefore Herbaceous Plants compose a very considerable part of the vegetable creation.

HERMANNIA, Hermannia.

This genus consists of shrubby exotics for the green-house, growing from about half a

yard to six or seven feet high, adorned principally with smallish simple foliage, and quinquepetalous flowers, in numerous spikes.

Class and order, *Monadelphica Pentandria*. *Characters.*] **CALYX** is monophyllous, five-parted at the brim, inflexed and permanent. **COROLLA**, five petals spirally twisted contrary to the apparent motion of the sun, broad and spreading above. **STAMINA**, five monadelphous filaments, and acuminate connivent antheræ. **PISTILLUM**, a roundish pentangular germen, awl-shaped style, and simple stigma. **PERICARPIMUM**, a roundish five-cornered quinquelocular capsule, and many small seeds.

The species that are principally cultivated are,

1. **HERMANNIA lavendulifolia.**

Lavender-leaved Hermannia.] Hath a shrubby stalk and slender branches, very bushy, about a foot and a half high; small, spear-shaped, obtuse, hairy leaves, and clusters of small yellow flowers along the sides of the branches, from June till autumn.

2. **HERMANNIA althæifolia.**

Althæa-leaved Hermannia.] Hath a shrubby stalk, and soft woolly branches, growing two feet high, ovalish, plaited, crenated, woolly leaves, and numerous yellow flowers, in loose spikes at the ends of the branches, in June and July.

3. **HERMANNIA grossularifolia.**

Gooseberry-leaved Hermannia.] Hath a shrubby stalk and spreading branches, growing three or four feet high; spear-shaped, pinnatifid, small, close-sitting leaves, and bright yellow flowers, by twos on each foot-stalk, numerous at the ends of all the shoots and branches, in April or May.

4. **HERMANNIA alnifolia.**

Alder-leaved Hermannia.] Hath a shrubby stalk and branches, growing irregularly four or five feet high; wedge-shaped, plaited, crenated leaves; and pale-yellow flowers in short spikes from the sides and ends of the branches, in April and May.

5. **HERMANNIA hyssopifolia.**

Hyssop-leaved Hermannia.] Hath a shrubby upright stalk, branching out laterally, six or seven feet high; smallish, spear-shaped, obtuse, serrated leaves; and pale-yellow flowers in clusters from the sides of the branches, in May and June.

6. **HERMANNIA trifoliata.**

Trifoliolate Hermannia.] With trifoliolate sessile leaves, retuse, plicated lobes.

7. **HERMANNIA pinnata.**

Pinnatifid Hermannia.] With leaves divided in three, the middle lobe pinnatifid.

All these species are African shrubs, but succeed here with the protection of a green-house in winter, so must be potted in pots of rich garden mould, and managed as other green-house shrubs. See GREEN-HOUSE PLANTS.

They are ever-green, and mostly of bushy growth, and produce a vast profusion of flowers in April, May, and June.

The propagation of all the sorts is by cuttings of their young shoots, any time from April till July, planted in pots of rich earth; which, if plunged in a moderate hot-bed, will very soon strike; and those planted in summer will also strike without the aid of hot-beds, even in beds of common earth, watered and shaded occasionally; and when rooted and begin to shoot, transplant them each into a small pot.

They may also be raised from seed; but this is seldom produced good here: it is procured from abroad, and must be sown in pots, and placed in a hot-bed.

HERMAPHRODITUS *Flos*. Hermaphrodite Flower. A flower furnished with both the male and female organs of generation, i. e. the filaments and antheræ, the male organs; and the germen, style, and stigma, as the female; all of which being contained within the same calyx and corolla, as in most, they are denominated Hermaphrodite Flowers.

Of this kind of flower, are those of all the classes, except *Monœcia* and *Diœcia*; in the former of which, male and female flowers, having each its distinct parts, are produced separate on the same plant; in the latter, on distinct plants; and in the class *Polygamia*, there are always Hermaphrodites mixed with the males, or females, or both, either on the same, or separate plants; and in the class *Syngenesia*, which comprehends the numerous tribe of compound-flowers, and in which sometimes the flower is composed entirely of Hermaphrodite florets, and sometimes Hermaphrodite and females, and frequently Hermaphrodites and florets of no sex, or neuter. See CLASSIS.

So that the greatest part of the vegetable creation produces Hermaphrodite flowers, either wholly, or mixed with males, or females, or both; whereby Hermaphrodites are as frequent in the vegetable, as they are rare and unusual in the animal kingdom.

Therefore remarking, that all flowers, whether simple, or composed of many florets, having both male and female organs within the same corolla, either simple, as above said, or in the corollula, or florets of a compound

flower, all contained within the same general calyx, are by botanists denominated Hermaphrodites, to distinguish them from males and females, which have each their parts distinct in their respective corolla, separate either on the same or in two distinct plants.

And all plants producing Hermaphrodite Flowers only, are termed Hermaphrodite plants.

HERNANDIA, Jack-in-a-box Tree.

It comprises two ever-green exotic trees of the Indies, sometimes retained here in stoves for variety, adorned with very large beautiful simple foliage.

Class and order, *Monœcia Triandria*.

Characters.] **CALYX**, male and female flowers, having a partial involucre of four oval leaves, and each of the females a bell-shaped cup. **COROLLA** is of six petals in the males, and eight in the females. **STAMINA**, three filaments, and large oblong erect antheræ. **PISTILLUM**, in the females, a roundish germen, slender style, and large half-funnel-shaped stigma. **PERICARPIUM**, the calyx becomes a large roundish, swollen, hollow fruit, inclosing a hard, drupaceous, juiceless nut.

The species are,

1. **HERNANDIA** *sonora*.

Sonorous Hernandia, commonly called Jack-in-a-box.] Grows twenty or thirty feet high, garnished with large broad peltated leaves, and monœcious flowers, succeeded by a large, swollen, hollow fruit, formed of the calyx, having a hole, or open at the end, and a hard nut within; and the wind blowing into the cavity of the fruit, makes a very sonorous whistling and rattling noise: hence the tree derived the name, Jack-in-a-box.

2. **HERNANDIA** *ovigera*.

Oriental oval-leaved Hernandia.] Grows many feet high, garnished with large oval leaves, not peltated; and monœcious flowers, succeeded by swollen fruit open at the end, and a nut within.

Both these exotics are of the tree kind, natives of the East and West Indies, where they attain a large growth; but here, being kept in stoves, they rarely grow higher than common shrubs; and very few, if any, of them have flowered or fruited.

They requiring a hot-house here, must be planted in pots of rich light earth, and always retained in that conservatory.

Their propagation is by seed, i. e. their nuts procured from the West Indies, &c. sowing them in pots of rich earth, and plunge them in the bark hot-bed; and when the plants come up, prick them out into se-

parate pots, plunging them also in the bark-bed.

HESPERIS, Rocket, Dame's Violet, or Queen's Gilliflower.

The plants are hardy herbaceous biennials and perennials, cultivated as flowery plants, producing annual stalks, two feet high, simple leaves, and tetrapetalous cruciform flowers, in large spikes at top, some of which are of great fragrance.

Class and order, *Tetradynamia Siliquefa*.

Characters.] **CALYX** is four-leaved and deciduous. **COROLLA**, four oblong cruciform petals. **STAMINA**, four long and two shorter filaments, and narrow erect antheræ. **PISTILLUM**, a four-cornered germen, no style, but an oblong stigma sitting on the germen. **PERICARPIUM**, a long, compressed, plane, bilocular pod, and many oval seeds.

The most material species are,

1. *HESPERIS matronalis*.

Dame's Violet, or Common Garden Rocket.]

Hath fibrous roots, crowned by a tuft of long, spear-shaped, rough leaves; upright, single, hairy stalks, two feet high; garnished with oval-lanceolate, slightly indented, close sitting leaves; and the stalk and branches terminated by large, long spikes of sweet-scented flowers, of different colours and properties in the varieties.

Varieties of this are,] Garden Rocket with single white flowers—double white flowers—single and double purple flowers—purple and white flowers—crimson flowers. All of which are so remarkable for imparting a most fragrant odour, that the ladies were fond of having them in their apartments. Hence derived the name Dame's Violet, and bearing some resemblance to a stock-gilliflower, were sometimes also called Queen's-gilliflower; but are now most commonly called Rocket.

2. *HESPERIS inodora*.

Scentless Rocket.] Hath fibrous roots, upright round firm stalks, two feet high, garnished with spear-shaped, acute-pointed, sharply indented, close-sitting leaves, and all the branches terminated by large spikes of scentless flowers, with obtuse petals, of different colours and properties in the varieties.

Varieties.] Scentless Rocket with single white flowers—double white flowers—single and double purple flowers. All of which are devoid of scent, but are showy garden flowers.

3. *HESPERIS tristis*.

Night-smelling Rocket.] Hath fibrous roots; upright, branching spreading, bristly stalks, two feet high; spear-shaped, pointed leaves;

and spikes of pale-purple flowers, of great fragrance in the evening.

They are all fibrous-rooted plants, the roots crowned with a large tuft of long leaves, and produce their flower-stalks annually in spring, flower in summer, ripen seeds in autumn, and die to the root soon after.

All the three species may be deemed both biennial and perennial; for, considered as biennials, they being raised one year from seed, flower the next, and then frequently perish root and all, especially the singles; but, with some care, both they and the doubles may be continued some years, and considered as perennials; for by cutting down some of their flower-stalks as soon as the flowers begin to fade, or rather before they attain a flowering state, it often promotes their forming off-sets at bottom the same season for increase, which being separated early in autumn, each forms a plant for next year's bloom; and it is worth practice for all the double kinds; by which means the plants may sometimes be continued from year to year, otherwise they are rather naturally of the biennial kind; and it is, therefore, also proper to raise some annually from seeds as directed in their propagation.

They are all hardy, more especially the first and second species, which prosper in any of the open borders, and in any common soil of a garden; but the third sort being rather impatient of severe frost, and much moisture in winter, should have a dry warm situation; and place a few in pots to move to the shelter of a frame in inclement weather.

The flowers are formed separately of four cruciform petals in the singles, but multiply in the doubles; and the flowers being numerous, and collected into large spikes, make a fine appearance, but more particularly the double varieties, which being as large and full of petals as double stockgilliflowers, are exceedingly beautiful garden flowers.

They all flower in June and July, and ripen abundance of seed in August.

Their stalks always decay in autumn, soon after the seed are ripe.

All the sorts are very ornamental furniture for any of the open borders of the pleasure-ground, and to intersperse in assemblage with other herbaceous plants, towards the fronts of the most conspicuous shrubbery clumps, contiguous to lawns and grand walks.

They may be planted out in autumn, or early in spring, before they advance much for flowering; and with care they may be removed with balls to their roots, so as scarce to feel their removal.

Propa-

Propagation.

Their propagation is performed three different ways: by seeds, by off-sets of the roots, and by cuttings of the flower-stalk.

By Seed.—This is sold very cheap at all the nurseries; and March and April is the season for sowing it; which sow in a bed or border of light earth, and either rake it in lightly, or cover it a quarter of an inch deep with light mould; and when the plants are come up three or four inches high, plant them out in beds six inches apart, to remain till October or spring following; then transplant them where you design they shall flower, which they will all effect the ensuing summer.

Observe, most of these seedlings will come single, that is, produce single flowers, and many of these go off after they have flowered; but as they may be easily raised in any quantity from seed as above, it is proper to raise a fresh supply annually to disperse in the common borders.

But as to the doubles, they are propagated with certainty only by dividing the roots, or by cuttings, as directed below.

By dividing the Roots.—This, and the cuttings of the flower-stalks, are the only methods to propagate the double kinds, for doubles of them are but very sparingly obtained from seed; and as they are rather sparing in forming off-sets from the root for propagation, as before observed, and being likewise often apt to decay entirely, root and all, after they have flowered, as being somewhat of a biennial nature, unless assisted by cutting down the stalks in young growth, to promote off-sets from the root; therefore let some good plants be allotted in any open bed or border for propagation, not suffering them to run up fully to flower; but when their flower-stalks have advanced about eight or ten inches high, cut them down close to the ground; and according as they shoot again, cut them also off; and by thus stopping their upright growth, the roots will more readily throw out young off-sets from their sides all around, which will be well formed by August, or early in September, when the whole root should be taken up, and the off-sets divided separately, and planted in a nursery-bed, six inches distance, to remain till October, or spring following, then removed with balls to where they are to stand to flower; the flower-stalks which are occasionally cut down to promote increase of off-sets at bottom, may be divided into lengths, and planted as hereunder directed; each cutting will root and form a plant for next year's bloom.

The above practice should be pursued annually to keep up your stock of doubles; for those which shoot up to full growth and bloom, rarely put out any off-sets, unless the stalks are cut down as soon as the flowers begin to fade, when sometimes they emit a few, but which will not be so many, nor so strong, as by the other method.

By Cuttings of the Flower-stalks.—Any time in the early part of summer when the flower-stalks are advanced about a foot in growth, or before they flower, some may be cut down, and each divided into two or three, so as to make so many cuttings, four, five, or six inches long; though the lower half generally forms the best cuttings; they may, however, all be planted to take their chance; observing to plant them in a shady border, putting them two parts out of three into the ground, about three inches asunder, and give water; let the waterings be frequently repeated, and many of the cuttings will be well rooted, and form shoots at top in six or eight weeks: but to promote their rooting more effectually, they may be covered close with hand or bell-glasses, as soon as planted, whereby they will strike much sooner; observing, when they begin to shoot at top, to raise the glasses to admit air, to which harden them fully by degrees.

Sometimes cuttings of the flower-stalks of those which have flowered, cut down as soon as the flower begins to fade, and divided into lengths, and planted as above, will also grow, though they will not produce so good plants as those formed of the young stalks early in the summer.

HIBISCUS, Syrian Mallow, or *Aithæa Frutex*, &c.

This genus furnishes a hardy, deciduous, flowering shrub, and flowery annual for the pleasure-ground, and some shrubby and herbaceous exotics for the hot-house, adorned mostly with largish, simple, lobated foliage, and large, quinquepetalous, mallow-shaped flowers.

Class and order, *Monadelphia Polyandria*.

Characters.] **CALYX** is double; the outer series is of many narrow permanent leaves, and the interior of one leaf five-parted at the brim. **COROLLA**, five heart-shaped petals united at their base. **STAMINA**, numerous filaments that coalesce below, and form a column, and kidney-shaped antheræ. **PISTILLUM**, a roundish germen, and slender style, five-parted at top, each part having a capitated stigma. **PERICARPium**, a quinquevalvular, quinquelocular capsule, and kidney-shaped seeds.

There

There are many species of this genus, but not more than four or five commonly cultivated in the English gardens; of which some are hardy, and others so tender as to require a stove in this country.

Hardy Kinds.

1. *HIBISCUS syriacus.*

Syrian Hibiscus, commonly called Althæa Frutex.] Hath a shrubby stem and branches, forming a bushy head, five or six feet high; garnished with oval, wedge-shaped, alternate leaves, cut at top into three indented lobes; and from the sides of all the young shoots, numerous, large, pentapetalous, spreading flowers, of different colours in the varieties, having all dark middles, darting out each way in radiant directions towards the extremity of each petal.

Varieties of this are,] *Althæa Frutex* with white flowers—with red flowers—pale-purple flowers—deep-purple flowers—with yellow flowers—and with variegated flowers, called Painted Lady *Althæa Frutex*—likewise with silver-striped leaves—gold-bloached leaves.

All these varieties are shrubby, flower in August, producing such great quantities of flowers in daily succession for three or four weeks, that the shrubs appear covered therewith, making a most delightful appearance, and are the greatest ornaments of the autumn season, of almost any of the shrubby tribe.

2. *HIBISCUS Trionum.*

(Trionum)—Bladder Ketmia, Venice Malice, or Flower of an Hour.] Hath an herbaceous branchy stalk, growing a foot and a half high; garnished with three-lobed leaves, deeply jagged on the edges into opposite obtuse segments; and from the joints of the stalks yellowish flowers with dark-purple bottoms, having the inner cup swollen like a bladder: hence the name, Bladder Ketmia.

This species is annual, sometimes called Flower of an Hour, (*Flos Horæ*) from the short duration of its flowers, which in hot dry weather but just open, and wither away in an hour or two; but these are succeeded by a plentiful daily succession for a long time.

Tender Kinds.

3. *HIBISCUS mutabilis.*

Changeable-flowered Hibiscus, or mutable China Rose.] Hath a shrubby, soft, spongy stem, branching into a spreading head, rising ten or twelve feet high; adorned with heart-shaped, five-angled, serrated, shining-green leaves, but pale underneath; and from the axillas of the stalk and branches, large, pentapetalous, spreading flowers, appearing first white, gradually changing to a blush-red colour, and from that to a purple.

4. *HIBISCUS, Rosa sinensis.*

Rose of China, or Double China Rose.] Hath a shrubby tree-like stem, dividing into a spreading head, rising twelve or fourteen feet high; oval, acuminate, serrated leaves; and from the sides of the branches, large, rosaceous, red flowers, having many oblong-roundish petals in several series, like a large double rose; and are exceedingly elegant; which, by way of pre-eminence, is by gardeners called the *Rose of China*.

HIBISCUS Malvaviscus.

(Malvaviscus)—or Scarlet-berried Mexican Hibiscus.] With a tree-like shrubby stem, branching ten or twelve feet high, garnished with heart-shaped, crenated leaves, lateral-angled, the hindmost angles small: and at the axillas, large scarlet flowers with twisted petals, succeeded by beautiful scarlet berries of a succulent viscous nature.

The first sort, *Hibiscus syriacus*, commonly known by the name of *Althæa Frutex*, is originally of Syria, but so hardy that it will grow here almost any-where in an open situation; and is so ornamental when in bloom, that all the varieties merit admittance into every shrubbery in the most conspicuous point of view, where the different varieties will have a most beautiful effect.

Their propagation is by seed, by layers, and by cuttings.

By Seed.—This is procured from abroad by the seedsmen; and March and April is the season for sowing it, which may either be sown in pots, and plunged into a slender hot-bed to forward them, or may sow the seed in a bed of light earth in a warm situation, covering it half an inch deep; the plants will soon come up, giving water in summer, and a little shelter in severe frosts; and when two years old, plant them out in nursery rows.

By Layers.—Autumn is the proper time; give the shoots a little cut through the bark at one or two joints, and lay them in the usual way: they will be rooted in one year.

By Cuttings.—March and April is the time to plant them: choose young shoots, which, if planted in pots and plunged into a hot-bed, will more readily strike; though if planted in a shady border, many of them will also put out roots.

The second sort, commonly called Bladder Ketmia, is a hardy annual of the flowery kind, and merits a place in the collection of hardy annuals in the open borders, &c.

Its propagation is by seed, which may be sown either in autumn or spring, in the place where you design the plants shall flower, in patches, several seeds in each; leaving, however,

ever, but two or three of the best plants in each patch.

The three tender species being natives of India, require to be continued mostly in a stove in this country; the first two of them produce flowers of the most singular beauty and elegance, equalling most of our finest roses, and both of which flower in great perfection in our stoves; and in Asia, their native soil, are some of their finest flowers: we often see them painted in many of the Chinese pieces, as also on the porcelain ware, to embellish china bowls, and other china vessels, particularly the flower of the *Hibiscus mutabilis*.

However, as the species will flower beautifully here, and sometimes perfect seeds, they are worth the attention of those accommodated with hot-houses; keeping them always in pots of rich earth, and retaining them constantly in that department; for although they will succeed in the open air in the heat of summer, and in a good green-house in winter, yet they rarely flower well without the continual shelter of the stove.

The propagation of these tender kinds is effected by seed, and sometimes by cuttings.

By Seed.—March, April, or May, is the time to sow it, and should have the aid of a hot-bed: sow it, therefore, in pots of rich earth, half an inch deep, and plunge them in any hot-bed under glasses, or in the bark-bed in the stove; and when the plants are two or three inches high, plant them out in separate small pots, give water, and plunge them also in the hot-bed.

By Cuttings.—Plant short cuttings of the young shoots in pots, in spring or summer, and plunge them in the bark bed.

HIERACIUM, Hawkweed.

The plants are hardy herbaceous perennials; one of which is retained as a flowery plant, has oval leaves, and annual stalks a foot high, surmounted by compound flowers in a corymbus.

Class and order, *Syngenesia Polygamia Æqualis*.

Characters.] CALYX, many narrow unequal leaves. COROLLA, many hermaphrodite ligulated florets in one general cup, each five-parted at the top. STAMINA, five filaments and cylindric antheræ. PISTILLUM, an oval germen, slender style, and two recurved stigmas. PERICARPium, none. SEMINA, a four-cornered seed to each floret, crowned with down, sitting in the calyx.

There are many species, but not more than one usually cultivated, viz.

HIERACIUM aurantiacum.

Orange-coloured Garden Hieracium, sometimes

called Grim the Collier.] Hieracium with many oblong-oval, entire leaves, crowning the root; an upright, single, hairy, almost leafless stalk, a foot high, terminated by reddish-orange-coloured flowers, in a corymbus, having dark coal-ash-coloured calyces, whence the cant name, Grim the Collier.

This is a hardy perennial, with fibrous durable roots; but annual stalks, which rise in spring, flower in June, continuing in succession two or three months, ripen seeds in autumn, and the stalks soon after decay.

It is proper furniture for the fronts of any of the compartments of the pleasure garden.

Its propagation is by seed, and by parting the roots. Sow the seed in autumn or spring, in a bed or border, and rake them in; and in June, when the plants are two or three inches high, prick them out in beds to remain till autumn; then transplant them where they are to remain.

By parting the Roots.—In autumn or spring divide the roots into slips or off-sets, and plant them where they are to flower.

HIPPOPHAE, See Buckthorn.

Of this genus there are two hardy deciduous shrubs for the shrubbery, adorned with spear-shaped and oval entire leaves, and male and female apetalous flowers on two distinct plants.

Class and order, *Diacia Tetrandria*.

Characters.] CALYX, male and female flowers on different plants, having monophyllous, two-parted cups. COROLLA, none. STAMINA, four short filaments, and oblong, angular antheræ. PISTILLUM, a roundish germen, short style, and thick, erect stigma. PERICARPium, a globular, unilocular berry, and one seed.

The species are,

1. *HIPPOPHAE Rhamnoides*.

(*Rhamnoides*)—*Bastard Rhamnus, or European Sea-Buckthorn.*] Hippophaë with a shrubby stem, branching irregularly eight or ten feet high, having a dark-brown bark, and armed with a few thorns; spear-shaped, long, narrow, sessile leaves, of a dark-green above, and hoary underneath; and male flowers in small clusters, and females on separate plants, growing singly, succeeded by berries in autumn.

2. *HIPPOPHAE canadensis*.

Canada Sea Buckthorn.] Hath a shrubby brown stem branching eight or ten feet high; oval leaves, and male and female flowers on separate plants.

Both these shrubs are very hardy: the first grows wild on the sea-shores in several parts of England, and the second in America.

They are retained in gardens as furniture for

for the shrubbery, to increase the variety with their two-coloured leaves, being of a dark-green above, and of a hoary white underneath; and in winter, when devoid of foliage, their young shoots being covered with turgid, irregular, scaly buds, exhibit also a singular variety.

They are cultivated in all the nurseries for sale, and may be transplanted any time in open weather from October till March.

Both sorts are propagated abundantly by suckers from the root, by layers, and by cuttings of their young shoots. All of which may be performed in autumn, winter, or spring.

HOE, for hoeing ground, &c.

A Hoe is a most useful and well-known garden instrument, of which there are two principal sorts, a Drawing-hoe, and a Scuffling-hoe; the former of which is, however, of the most general use: but as of each sort there are different sizes, all materially useful occasionally in general gardening, shall describe each and its principal uses, as follows:

Drawing-hoe.—This is the most common and useful kind of Hoe for most sorts of hoeing work: which being fixed with its edge inward, the workman, in using it, always draws towards him; and is one of the most useful implements of gardening for many purposes, both for general hoeing, and in drawing drills for sowing many sorts of seeds, loosening the earth about, and moulding up the stems of plants; and hoeing down weeds between all sorts of plants, that stand distant enough to admit it; and is the best adapted Hoe for thinning out esculents to proper distances to acquire their proper growth, such as onions, carrots, parsneps, turneps, spinach, &c. by cutting up all the superfluous plants, or such as grow too close, and at the same time cuts up all weeds, as well as loosens the earth effectually about the remaining plants; which always proves very beneficial culture to all vegetables.

But of the Drawing-hoe kind, there should be three or four different sizes from six inches width, down to two inches, as described below.

First size.—This is a large Hoe for common use, about six inches long in the plate, by three or four broad, fixed on a long handle for both hands, and is the proper sort to use for all common hoeing-work, and for drawing drills for sowing peas, beans, kidney-beans, &c. (see **DRILL SOWING**); and is the most eligible sized Hoe for broad-hoeing between rows of all those kinds of plants, and all others that stand distant enough either in

rows, or otherwise, for the hoe to pass between them, both to cut down all weeds and loosen the ground, and to earth up the stems of the plants, and for all other purposes of hoeing where the plants stand distant, both in the kitchen and pleasure-garden.

Second size.—This should be about four inches long-ways in the plate, and is useful both for drawing drills, and for hoeing among various plants, where the former sort of Hoe cannot be commodiously employed, and to thin some sorts of esculent crops that require moderate distances; such as the Dutch turneps, general crop of carrots, parsneps, &c. this is also a proper sized Hoe for hoeing common flower beds and borders, &c.

Third size.—This is two inches and a half, or not more than three inches broad in the plate; and fixed on a short handle to use with one hand in small-hoeing, thinning out several sorts of esculent crops, and other occasions among close-growing plants; and a similar one occasionally fixed on a longer handle to use two-handed in hoeing borders and other compartments of smaller plants, standing near together both in the kitchen ground and flower-garden, &c. and this sized hoe, on a short one-hand handle, is particularly useful for small hoeing and thinning many kitchen crops in young growth; such as onions, leeks, carrots, parsneps, spinach, &c. to cut them out to the proper distances they require for growing to perfection, and at the same time cutting up all weeds, and loosening the earth between the plants, beneficially to their advantage; and is a very convenient-sized Hoe for use on many other occasions of hoeing; and for drawing small drills for sowing many kinds of seeds; and hoeing in flower-beds, &c. where the larger Hoes cannot be readily admitted between the plants.

Fourth size.—About two inches width, fixed in a short handle, and is proper for small-hoeing onions and small crops of carrots, radishes, &c. the first time, where they stand pretty close, and where it is not designed to thin them out at once to their full distance, but to leave them rather thickish for culling, &c. and will be found very convenient for occasional use among many small crops.

Each of the above sizes of drawing-hoes will be found extremely useful in their turns; and every gardener should furnish himself with a proper set, as the expense is but trifling, and they are sold by most of the nurserymen, and at all the ironmongers' shops.

Always keep the edges of the Hoes sharp by occasional grinding on a grind-stone, that they may cut clean at every stroke; and the work

work will be both more easily, effectually, and expeditiously performed.

Scuffling-hoe.—This is commonly called a Dutch Hoe, as being much used in Holland for scuffling their sand walks, &c. It is fixed, with the edge outward, on the end of a long handle, so as the person using it pushes it from him, and goes backward, never treading on the hoed ground, as with the drawing hoe; and as to size, is from about four to six or eight inches wide, open in the middle, for the mould and weeds to pass through, so as not to be drawn in heaps; having a long socket at the back part, in which to fix the handle, which may be five or six feet long.

This Hoe is very proper for scuffling over any piece of ground to destroy weeds, that is clear from crops, or between crops that stand wide, and in which a person may make considerably more expeditious work than with a Drawing-hoe, especially when the weeds are not suffered to grow large; in which case one man can do as much as two. Observing, however, this Hoe is adapted principally for cutting down weeds, or stirring the ground between wide crops, in rows, as above noticed; but not proper for hoeing out crops of esculents, nor for earthing up the stems of plants, nor for hoeing where the plants stand close.

This Hoe for cutting down weeds will also make great riddance in shrubberies and wilderness quarters, where the shrubs stand distant from one another.

It is also one of the best sorts of Hoes for scuffling over sand-walks, or others of loose materials, to destroy weeds, moss, &c.

This kind of Hoe, small size, will be found useful to run over flower borders, to cut up straggling weeds; which, being fixed on a long handle, may be effected by standing in the walks, without treading on the borders.

HOEING, a necessary garden culture performed by hoe, to destroy weeds, loosen the soil, and to mould up the stalks or stems of plants.

Hoeing is the most expeditious method of destroying weeds between all plants that stand distant enough to admit the hoe between: observing, that all Hoeing designed principally to destroy weeds, should always be performed in dry weather, and the more sunny the better, especially when the weeds are not to be raked off, that they may die as they are cut down, or at least be so much flagged or withered by the sun and air as not to grow again; cutting deep enough to strike the weeds nearly up by the roots, which may be easily effected both to all the annual or seed-weeds; and perennial-root kinds, for if they are only

stumped off, they will soon shoot out again; observe also, in the course of Hoeing, not to draw the earth and weeds in heaps, as in which the weeds, if not raked off, will often grow again; let, therefore, the work of Hoeing be always performed so evenly, that all the weeds be turned upon the surface clear out of the mould; and if any are unavoidably drawn in heaps, or the earth adhere much about the weeds so cut up, always disperse them by a stroke of the Hoe, that all the weeds may be turned fairly above the ground for the sun and air to kill them.

But Hoeing, besides its use in expeditiously destroying the weeds, it at the same time, by loosening the surface, disposes the ground to receive the greater benefit from the air, dews, rains, &c. to the great nourishment of all sorts of plants, and by breaking up the surface, dividing the clods, and stirring the earth, keeps it fresh, proves a very beneficial culture to all vegetables, as will be evident from practice and observation: and in soils apt to bind after much wet, which causes the plants to appear of a stunted growth, apply a common drawing-hoe, larger or smaller according to the nature of the plants, and distance of growth from one another, cutting deep enough to loosen the ground one, two, or three inches down; it will encourage the plants to put out fresh fibres, add vigour, and greatly promote a free growth.

Likewise, Hoeing up earth about the stems of plants is a very essential piece of culture, such as earthing up rows of peas, beans, kidney-beans, cabbages, cauliflowers, &c. which is ever of great service in promoting strength and vigour in the plants.

Hoeing is also beneficial in thinning many close-standing crops to proper distances, cutting out the superabundant plants, and weeds, and loosening the soil, which is always essential culture.

HORSE-DUNG. Horse stable dung is an article of great utility in gardening; such as for the important purposes both of forming the most general hot-beds, wherein to raise various early productions, and numerous tender plants; and afterwards, when done with for these occasions, declining to a decayed state, becomes excellent rich garden manure.

This article, Horse-dung, considered in the general application, is the dunging of horses and dungy moist litter together of stables in which horses are most constantly kept when not in their respective work; and the stalls being always littered thickly with straw, which, by the dunging aforesaid and urine of the horses, is rendered wet or considerably moistened,

ened, becoming of a strong, warm, fermenting nature; and this wet or moist litter, together with the dunging of the horses, as just observed, being cleared out every morning, &c. from the stables to the common dung-hill, where, from the peculiar hot nature of the excrementary dung, and that of the urinous and dungy moisture of the litter, the whole, together, being in some considerable mass, ferments in a high degree of strong heat; and by some little preparation in forking up the requisite quantity mixedly into an heap, remaining for a week or fortnight, is brought to an improved state wherewith to make hot-beds, as hereafter directed (see HOT-BEDS); for it must be remembered, the Horse-dung simply, i. e. the horse droppings, without the mixture of the urinous and dungy wet litter, long and short together, in a large proportion, would not answer the purpose of hot-beds.

This Horse-dung for hot-beds should be such as has previously remained some time together in the common dung-hill or heap till collected in proper quantity; and if it has commenced some fermentation, less or more, or has become wholly, or the principal part, of a moist, warm, steamy quality, it will be preferable; and if, on turning it up with the dung-fork, it begins to assume a blackish appearance, not rotten, nor exhaustedly dry, but abounding in a fresh material substance, of a lively, moist, steamy warmth or heat, is then in a good state of perfection for this purpose: or fresher dung full of moist, warm, steamy litter, is also very eligible, as it may be prepared to a proper temperature, by removing the quantity required from the common dung-hill; and fork up the whole, short and long together, in a mixed order into an heap, as before intimated, to remain one, two, or three weeks, according to the quantity and quality, turning it over once or twice in that space of time; it will be in good preparatory order for a hot-bed; and we may observe, that moderately fresh dung, of a middling degree long, is generally of a more durable heat when formed into a bed for a hot-bed, than old dung of some considerable time lying in the dung heap.

In this Horse-dung for hot-beds, as sometimes the dung-hill or common heap having in the large mass together collected closely, fermented in some considerable degree, or casually so fierce as to scorch-dry, or steam-burn the material part, or brought on an exhausted decayed state, by which it is rendered much inferior to that of a fresh substantial nature, of a lively, moist heat; and in this case it, for the purpose of hot-beds, should be re-

jected as much as possible, especially the most exhausted, immaterial part thereof, if enough of a fresh temperature can be obtained.

Likewise sometimes the Horse-dung in the common dung-hill has frequently a mixture of very long, strawy litter, in the general mass, which if also very dry, should generally be turned aside; as it would never heat properly, and be very apt to dry-burn when formed into a hot-bed, especially if in any considerable quantity; and so therefore always give preference to the middling long and short dung together, of good fresh substance, and full of a moist, steamy heat, as before observed: though, if it unavoidably abounds considerably in very long dungy litter, if this is of a tolerably moist quality, it, by forking up mixedly together, will then become of proper temperature for a hot bed.

Generally in collecting Horse-dung for occasional hot-beds, if it is rather of a very fresh green state, long and strawy, it would be of advantage, previously to cast it up in a heap, well mixing the short and long, moist and dry, as equally together as possible; remaining then a week or two, it will ferment and acquire an equal degree of proper heat, so as, when formed into a bed, the heat will advance more regular and moderate, and be of longer duration than if taken fresh from the dung-hill and used immediately for a hot-bed.

After this material, Horse-dung, has effected the required purpose in hot-beds, it, in the course of a few months, wholly loses its property of heat, and declines; and then, if in beds which have not burned by over powerful heat in their early state, the said dung, in decaying gradually, becomes of a soft, fat-rotten substance, forming a most rich and general good manure for the kitchen ground, superior to all others; but in such beds as have casually burned in their full heat, or been made of rather dry, very strawy dung, it, in its decayed state, is generally of a more dry and less substantial nature; though it is also proper to use as good garden manure, but probably inferior in some degree to that of a moist, soft, fatty quality, as above, such as will sometimes spit or cut with a spade, which is a preferable manure for most principal crops; however, the whole, in both the above temperatures, are superior to most other dungs for general manure to kitchen grounds, where attainable in proper quantity.

Or Horse-dung for manure may also be such as is taken immediately from the common dung-hill or heap; and if it has lain long

long enough for the mass to become of a good, moist, mulchy substance, not material whether half or thoroughly rotted, provided it is of that temperature; or if the whole has commenced a decaying or moist rotten state, it may be preferable, or at least, more generally effectual good manure, than entirely fresh or new-made rank dung of the same kind; however, on particular necessary occasions of manure being immediately wanted in any compartment, this dung may be beneficially applied as it occurs at the time, either moderately new, moist, and not very strawy, or in a decaying or rotted state, or the whole mixedly together.

But Horse-dung hills designed principally to remain for garden manure, or as required; it would be of beneficial advantage for its improvement for that occasion, to have the whole forked over either in the same place, working the moist and dry, long and short together; or wholly removed from the original heap, and fork it up in the same mixed order into a regular layer; and in either of which, the different parts being incorporated in a general manner, it will acquire all an equal quality, in good perfection for use in three or four to five or six months.

HOT-BEDS. Beds formed either of horse-dung or tanner's bark, raised two, three, or four feet high, and covered with garden frames, glasses, &c. designed to effect a certain degree of heat, for raising tender plants, and for forwarding others to early perfection.

By the aid of Hot-beds we are able, in our northern climate, to imitate that of distant warm countries, so far as to exhibit their plants, flowers, and fruits, often in very great perfection, which, without such artificial aids of heat, could not possibly be raised, nor continued in these parts of the world; for by the assistance of Hot-beds, vast numbers of seeds, which would otherwise remain years in the earth, and some never grow at all, are made to germinate, form plants, continue their growth, and produce their flowers and fruits, as in their native soil. By Hot-beds, also, cuttings and slips of many sorts of trees and shrubs, which would otherwise remain inactive and perish, are made soon to emit fibres at bottom, and shoots at top, and become each a new vegetable.

Likewise by Hot-beds many of our valuable esculents of the kitchen-garden, that succeed in the full ground at one time of the year or other, are brought to perfection a month or two sooner than they would naturally attain in the open air, and some a quarter of a year, or more, sooner than they could other-

wise be obtained; exemplified in the cucumber, which by no art can be made to grow in the full air before May or June, nor be brought to produce fruit in the open ground before July or August; but by the aid of Hot-beds, are obtained often in the middle of winter, or early in spring: again, asparagus, which grows all the year in the open ground, yet its natural produce never arrives to perfection before May and June; but by Hot-beds we obtain it all the winter in any weather, from November until the arrival of the natural crops; peas, beans, kidney-beans, radishes, carrots, strawberries, and various salad herbs and other plants, which grow in the open ground, are by Hot-beds forwarded to perfection a month, and sometimes two or three, sooner than they otherwise could be procured.

We also by Hot-beds forward many of our hardy fruits, as cherries, plums, apricots, peaches, grapes, figs, &c. six weeks or two or three months sooner than they naturally would in the open ground.

By Hot-beds many beautiful and curious annual flowers are raised to perfection, that could scarcely attain to a flowering state here in the full ground. See **ANNUAL PLANTS.**

And by Hot-beds, many hardy flowers, both of the herbaceous and shrubby plants, are brought to flower in winter, and early in spring, which do not naturally appear before May and June, such as pinks, carnations, sweet-williams, narcissuses, jonquils, hyacinths, tulips, roses, honeysuckles, and various other plants of moderate growth, which you may incline to forward into an early bloom.

Hot-beds, therefore, are of the greatest utility in gardening: they are, as before mentioned, composed of two principal materials, horse-dung and tanner's bark; the former of which is the most common sort of Hot-beds for general use, and the latter have been already treated of under the article **BARK-BED.** It will, however, also be proper to give some general hints respecting each in this place, under two separate heads, viz. horse-dung Hot-beds, and tanner's bark Hot-beds.

Horse-dung Hot-beds.

As horse-dung Hot-beds are of general utility in gardening, I shall first proceed to explain the general practical methods to be observed in those kind of Hot-beds.

Horse-dung Hot-beds are the most commonly used for all framing or forcing-work in the kitchen-garden, for raising tender or early esculents; also for working some kinds of forcing-frames, to have early fruits and flowers;

for this material, horse-dung, being not only the most easily obtained in all places, but cheaper than tanner's bark, the other Hot-bed material; besides, that after having performed its office as a Hot-bed, it becomes rotten and buttery, and the most excellent manure that can be for the garden; so that horse-dung Hot-beds are preferable for general use in the kitchen-garden. See DUNG and HORSE-DUNG.

The sort of horse-dung to be understood for the purpose of Hot beds, is the dung and wet litter together, daily cleaned out of stables where horses always stand, and are littered down with plenty of straw every night, which being rendered wet by the urine and dung of those animals, composes the principal material for a dung Hot-bed; for the dung alone without litter would do nothing; but the litter being thus moistened, and cleared out along with the dung, and both mixed together, and collected in any considerable quantity in a heap, or formed into a bed, its moisture, by the urine and dung of the horses, which is naturally of a strong, hot quality, quickly promotes a fermentation and strong heat, often so violent as not to be able to bear one's hand therein, and even to burn the roots of plants, if any were planted while the vehement heat continues; but by a proper preparation, is brought to a moderate degree of warmth, suitable to the growth of vegetables.

Observe also that the dung must be fresh; that is, such as has been but a few weeks or a month or two in collecting from the stables, or at least that hath not lain so long in the dung-hill as to exhaust itself, and greatly lose its heat, and beginning to rot; for the newer the dung, in a middling mulchy degree, as above, the better, its heat proving always the most effectual and durable, provided it is properly prepared, as hereafter directed, previous to its formation into a bed. And although older dung may, by shaking up and mixing coal-ashes therewith, be brought to heat a little again, yet it will be ineffectual, and of short duration, and deceive you; nor should you, if possible, use that very long strawy dung, often to be met with, especially that which has heated greatly, burned, and exhausted its fermenting property in the dung-hill, appearing very dry, and of a whitish mouldy colour, for this will never acquire a proper heat of much durability; therefore always chuse the fresh, mulchy, steamy dung, full of moist litter, which, although some may be rather long or strawy, if of a moist temperature, by mixing all well together in a heap, the whole will acquire a proper fer-

mentation for a Hot-bed; and the fresh dung will be of double the duration of such that has lain long and exhausted its first fermenting property, as above observed, in the dung-hill.

Sometimes coal-ashes are mixed with dung to promote a more quick and durable heat; which, however, is more necessary for dung that has somewhat exhausted itself by being long in the dung-hill; when mixing a bushel or two of ashes to a cart-load of dung, will have some effect in contributing to the revival, strength, and duration of the heat; but as to fresh dung full of heat, it requires no such aid; and although it may help to continue the heat longer, yet is sometimes apt to promote a too fierce burning heat at first, of a dry, scorching nature: therefore I would advise it to be used but sparingly, or not at all, in fresh dung.

The dung, previous to its formation into a Hot-bed, should be moved from the dung-hill, well mixed, and cast up in a heap, or, if a large quantity, in a long high ridge, to lie a week or two to prepare it to a proper temperature for making the bed; therefore, with a dung-fork, take the long and short as it comes to hand, shaking it up, and mixing it all well together, in a pretty high heap or ridge, to lie ten, twelve, or fifteen days, or more, as you shall judge proper, according to its quality, for all the parts to be equally moistened and meliorated, and for the strong rank stench and steam to evaporate; and if, in six, eight, or ten days, according to the quantity, the whole is turned over, casting it up in a heap again, it will give greater vent to the noxious vapour and burning heat to pass off; and by thus mixing the parts again, the whole mass will be every way better prepared for the purpose of a Hot-bed: and this is more particularly necessary to dung of unequal substance, in some part, probably, being very long or strawy, and some of a dry, somewhat exhausted state, other parts are probably of a mulchy, moist consistence; for dung of that inequality, without having the above previous preparation, to improve the whole to an equal temperature, is apt to heat irregular and less durable: and it may be observed in general, that dung not prepared as above is more apt to heat violently when formed into a bed, so as to burn the earth thereof, as well as the roots of the plants, and send up a strong rank steam, pernicious to all vegetables; and a Hot-bed of this burning quality is apt to lose its heat suddenly; for all which reasons, never omit preparing the dung as above for all kinds of principal dung Hot-beds.

With respect to the exposure and situation wherein

wherein to make the Hot-beds,—all Hot-beds should be made principally in the kitchen-garden, in a sunny sheltered situation, and where the ground is rather dry, and free from standing water at all seasons; and it is of much importance to contrive to have the place in a part of the garden nearest the dung, or place whence it is brought into the garden, in order to have as short wheeling as possible, which is an article of great attention where there is a considerable quantity of framing.

As to the preparation of the place for making the Hot-bed,—dung Hot-beds are sometimes made entirely on level ground, and sometimes in a trench or oblong cavity formed in the ground, the width and length of the intended bed, and twelve inches to a foot and half deep, or more; but for early work in winter or spring, I should advise to make it mostly above ground upon the level surface, both that the bottom of the bed may stand dry and not liable to be chilled by wet accumulating as when made in a trench in those seasons, and that, when the heat declines, both sides of the bed may be lined with hot dung quite to the bottom, so as the whole bed, from thence to the top, may have an equal benefit of the lining to revive its decaying heat; which is essentially necessary during winter and spring, until the middle or latter end of May, when the heat of the season renders linings unnecessary; whereas when the Hot-bed is made in a trench, at an early season, when linings must be added to support a constant regular heat, all that part of the bed within the ground is consequently deprived of the advantage thereof, unless you shall dig the earth away all round, to the depth of the bed, wide enough to admit of a lining; for as all dung Hot-beds generally begin to decline their heat in three or four weeks, the heat must at any rate be revived or renewed accordingly, during the continuance of cold weather, by an augmentation of fresh hot dung, piled up against the sides, which in practice is called lining the beds; and by applying these linings occasionally, the heat of a dung Hot-bed may be continued four or five months, provided the whole bed from bottom to top can be thus lined: this, therefore, shows the necessity of making these Hot-beds for early work entirely on the surface of the ground; besides, as above intimated, when Hot-beds are made in deep trenches in winter, water is apt to gather in the bottom, and chill the lower part of the beds; I would, therefore, also advise, that in low, or very moist ground, the place where the Hot-bed is to stand, be rather a little the highest, particularly for early beds, that

all moisture from the dung, rains, snow, &c. may drain off from that part. Some, however, are of opinion, that making Hot-beds in a deep trench preserves the heat longer: this, in particular cases, as mentioned below, may have some effect, but is not proper at all where lining is necessary; therefore, for early work, or almost in general for frame Hot-beds, be persuaded always to make the beds mostly or wholly on level ground.

If it is, however, intended occasionally to form a trench in which to make the Hot-bed, make the trench four feet and half wide, or the width of the frames, if for a frame bed, with length in proportion; if for hand-glasses, or paper frames, three or four feet width; and in all of which, not more than a foot deep for early beds, or if wet ground, half that depth is full enough, for the reasons before assigned: but if towards summer, for hand-glass beds in April and May, when the ground will be dry, the weather becoming settled, and no danger to be apprehended from copious moisture below, and the warm season nearly arrived, when but little aid of lining will be requisite, may then with more propriety be made in trenches, twelve or eighteen inches deep, for the hand and bell-glass cucumbers and melons, especially if designed to make them in some convenient division of the kitchen garden, for the sake of having the excavated earth of the trench laid ready at hand for immediate earthing the bed, to save trouble of bringing earth from a more distant part: but, otherwise, may either be made in a trench or wholly on level ground, as it may be thought most expedient, agreeable to the above intimations: or however, if the beds for hand-glasses are made in a trench, as above, or having plenty of good earth convenient, the whole bed thus made may be earthed all over so closely, as to cover every part of the dung, to confine the heat, that it may retain a due temperature without lining at all, till the middle or latter end of June, when the warm settled weather will be arrived, and the natural temperature of the season will enable the plants commonly raised in these kind of Hot-beds, to succeed without any further aid of artificial heat, the remainder of the summer.

As to the dimensions of dung Hot-beds, they should generally be a parallelogram, or long square, ranging nearly east and west; to any length convenient; about four feet and a half broad, if to be covered with common garden-frames; and three and a half or four feet, if for hand-glasses; raising them, if in winter, or early in spring, three or four feet high, allowing for settling, as they will settle half

half a foot or more in a fortnight's time after making : and the early beds ought to be substantial, otherwise they will not support a durable uniform temperature of heat for continuing the respective plants in a regular, free growth, at an early season ; which, by aid of linings, must be effected till the arrival of warm weather ; observing, however, that Hot-beds made in winter should be three feet and a half high at least when first made ; or if four, the better. Those made in March need not be above a yard high, in April the same, or two feet and a half ; and in May two feet may be a sufficient thickness, and even eighteen inches about the middle and latter end of that month ; remarking, as above-said, that all Hot-beds are to be ranged length-wise east and west, or nearly so ; but more especially those intended to be covered with frames, that the glasses or lights thereof may exactly front the south for receiving all possible benefit of the sun. And as to the method of making the beds, see *Making the Hot-bed*.

Observe also, that all dung Hot-beds must be moulded or earthened at top, for the reception of seed and plants, covering every part of the dung at top that no steam may rise therefrom without first passing through a body of earth, which otherwise, being of a rank pernicious nature, would prove destructive to most vegetables. Likewise, if the seed or plants are to be in pots, the bed must also be earthened at top, of due thickness, in which to plunge the pots to their rims ; remarking, that the proper depth of mould necessary to lay upon these Hot-beds is from about five or six to ten or fifteen inches, according to the use or nature of the plants to be raised therein ; which is generally noticed in the culture of the different sorts as they occur under their respective genera ; though from about five to eight or ten inches are the most common necessary depths of earth for dung Hot-beds. See *Earthing the bed*.

A Hot-bed may be made either for a one-light, two-light, or three-light frame, or for two, three, or more three-light frames in a range ; the three-light frames being the most common sorts for general use, especially to receive plants from the smaller frames, to remain to grow to perfection, or to forward them to any considerable size (see FRAMES). But a Hot-bed designed chiefly as a seed-bed for raising a few plants for transplantation, as cucumbers, melons, tender annuals, &c. a bed for a single frame, either a one-light or a two-light box, may be sufficient, especially for private use, or for early work ; or may be for a three-light frame, according to the quan-

tity of plants required. And as the tender plants raised in either of these frames advance in size, fresh Hot-beds of greater extent for two or more three-light frames must be made for their reception, according to the directions given in the culture of the respective articles, either of seed, plants, cuttings, &c. requiring the aid of Hot-beds, as explained for each under its proper genus : observing that all dung Hot-beds made in winter, or any time in spring, before the middle of April or beginning of May, should generally be covered with frames and lights, especially for tender plants. But Hot-beds made late, i. e. from about the middle or latter end of April until the end of May, will succeed for several sorts of plants, to be covered with hand or bell-glasses, also with oiled paper frames, as cucumbers and melons for latter crops, and for raising many sorts of annual flower-plants that require forwarding in moderate Hot-beds. And late Hot-beds, for forwarding any of the less tender or hardier sorts of seeds, plants, and cuttings, in default of frames, or hand-glasses, &c. may be arched over with hoops, and covered occasionally in bad weather and every night with mats until June ; or you may contrive very cheap and eligible covers with oiled paper for these late Hot-beds, which are generally preferable to mats, but under either of which may be raised cucumbers, and many of the hardier tender annuals, as African and French marigolds, chrysanthemum, China Aster, ten-weeks' stocks, &c. also strike cuttings of many sorts of plants ; but for striking many sorts of the hardier cuttings that require aid of Hot-beds, oiled paper frames are the best covers that can be used for that purpose in May, June, and July ; as they at the same time afford both shelter from cold, and shade from the sun, yet admit its influence both as to light and heat in a proper degree for the work of vegetation.

According therefore to the above hints of dimensions, &c. mark out on the ground the width and length of the intended Hot-bed, allowing, if for frames, for it to be two or three inches wider on each side than the frame ; and according to that standard may either make the bed entirely on the surface, or in a trench, agreeable to the rules before laid down.

Making the Hot-bed.

To make the Hot-bed, shake some of the longest, or most strawy dung along the bottom, to begin the first formation of the bed ; then take it, long and short together as it comes to hand, and shake it evenly on every part, raising the sides perfectly upright, straight, and as firm as possible ; forming the corners also

also always full and very firm, keeping the middle well filled with the best dung; and as you go on, beat each layer of dung evenly and firmly down with the dung-fork; or, if very long, loose, strawy dung, it may be trodden, to settle every part equally; but in common middling dung, by no means tread, only beat it regularly down, as above, and in this manner proceed till the bed is arrived to its designed or necessary height, according to the season, as before observed, or use it is intended for, as is always hinted in the respective articles; making proper allowance of a foot, or thereabouts, for settling; raising that intended for frames, two or three inches higher in the back or north side than in front, to give the greater slope of the glasses to the sun, finishing the top even in every part; and when the bed is thus raised to the height intended, trim up all the short dung remaining at last round the bed, laying it on the top ridgeways along the middle, which may either then, or rather, if a strong bed, in a few days after, when the bed has settled a little, be levelled to make good all inequalities, and smooth the surface; then set on the frames, &c. and earth the bed agreeable to the rules hereafter laid down.

The proper frames and glasses in general use for these Hot-beds, are described under the article FRAMES. The common sorts are one-light, two-light, and three-light frames; the two former generally for smaller purposes, as seed-beds, or nursery beds, for raising and forwarding plants for final transplantation into three-light frames; so that one or two of each of these sizes may be sufficient; and have a proper supply of the three-light frames for general use, as before observed. See FRAMES.

Hand-glasses for covering late Hot-beds are of two sorts; square, or leaded hand-glasses, and bell glasses. The square glasses being framed with lead, and of many small panes of glass worked into the lead-work. The bell-glasses are shaped like a bell, all of one piece, are blown at the glass-houses, where they are sold, and are rather preferable to the square glasses for the growth and preservation of plants; only there is this advantage in the squares, that if broke they can be readily mended; but the bells, when broken, are generally rendered useless, though if not broke into pieces, they may sometimes be joined by a cement of white-lead colour; and the London gardeners, some of whom work several hundred hand-glasses in a season, generally prefer the bells to the other sorts. Either of these sorts of glasses are proper to use for Hot-beds made any time from about the middle or

latter end of April to the beginning or middle of June, and thence continued all summer, or as long as thought necessary for the protection of the plants, from casual heavy or incessant rains, &c.

Paper frames being light open frame-work, constructed like the roof of a house, or top of a covered waggon, and covered with oiled paper, are most excellent for summer Hot-bed work, i. e. Hot-beds made in May and beginning of June. See CUCUMBER and PAPER FRAMES.

Having, however, formed the Hot-bed for either of the above, and if of some considerable substance in thickness and length, it will be advisable, particularly for frames, to defer the framing and earthing it finally for several days, or a week or more, according to the strength of the bed, until a little settled, and the first violent heat subsided; for the heat will be very strong, and frequently of a burning quality, for the first week or two after it is made: it may, however, be proper to set the frames and glasses on both, to defend the bed from excessive rains or snow, and to draw up the heat sooner, to forward the bed to a proper temperature for the reception of the mould, and seeds or plants, observing to raise the upper ends of the lights a hand's breadth high, or shove them so much down in dry weather, that the great steam always arising in Dung Hot-beds may pass freely off; for in strong Hot-beds neither the earth, seed, nor plants, should be put in till the fierce heat and violent steam has a little abated, which may be in six, eight, or ten days, or a fortnight, according to the substance of the Hot-bed; for that for one frame only will sooner work itself to a proper degree of heat for the purpose of vegetation: than a range; for two or more frames, though a Hot-bed of slender substance may be framed, &c. earthed and all, as soon as it is made, as no great danger is to be apprehended from burning, and more particularly those for small frames, hand-glasses, &c. but to Hot-beds of any considerable substance, either for one or more large frames, always use the above precaution previous to earthing, sowing, or planting, especially if you intend to sow or plant in the earth of the bed; or even if you sow or plant in pots, plunging them in the earth, that although they may be raised up if there is danger of burning at bottom, yet but few plants thrive well when there is a very great steam and vehement heat.

Where there is a considerable range of substantial Hot-beds for many frames, the placing the frames thereon before they are to
be

be fixed for good, may not be convenient; in which case it is proper, in default of the frames, to have mats, or dry long litter, ready to cover the top, in case of excessive rains, or snow falling, which might chill and retard the bed greatly from becoming of a due temperature for the reception of the earth, &c. and sometimes occasions a bed to become of a burning quality, which otherwise would be of a regular temperature.

In strong Hot-beds designed for strength and duration of heat, it will, as soon as they are made, be proper to provide some sharp-pointed sticks, two feet long, to thrust down into the middle of the bed in different parts, that, by pulling out the sticks daily, and feeling their lower parts, will enable you to judge of the working and temperature of the bed, to know more readily when of a proper state for the reception of the mould and plants, which in strong beds must not be trusted therein till the burning heat is past.

If the Hot-bed is, therefore, of good substance, and for the large frames, it is proper to let it remain some days to settle, before it is framed for good, because, notwithstanding all the care in making, it will often settle unequally, and should be levelled before it is earthed; in from about three to five, six, or eight days, according to the nature of the dung, or substance of the bed, it will have so far settled as to discover the inequalities, if any; when, if the frames and glasses were placed thereon for the purposes above-mentioned, they must be taken off, and all the inequalities made even by levelling the top as you shall see necessary, making the surface firm, and smooth it off neatly with the back of the spade, and directly put on the frame and glasses for good; opening the lights a little at top to give vent to the steam, as before observed; and as soon as the bed is become of a moderate temperature, and there is no danger from too violent a heat, put on the earth, to receive the seed or plants.

Earthing the Bed.

With respect to earthing the bed; observe that substantial dung Hot-beds for frames, after being covered with the frames, &c. they sometimes heat violently the first week or fortnight; and that if the earth was put in during the fierce heat, it, by confining the heat and steam still more closely, will be in danger of being burnt to a whitish mouldy colour, and burn also the seed and roots of the plants, if any were sown or planted; and when the earth is thus burnt by the heat of the dung, no seeds nor plants can vegetate or thrive in it; so that when this happens to be the case, all the

earth must be taken out, and replaced with the like quantity of fresh compost. Therefore, in Hot-beds of any considerable substance, either for one or more frames, examine, previous to moulding them, the state of heat daily with good attention, both by the sticks, and by thrusting your hand down into the dung: thus you will judge regularly of the working of the bed from its first formation, to its greatest heat; and thence till the vehemence of it begins to abate, and become proper for vegetation; then prepare to put in the mould. It is an observation worth notice, that when a sort of *fungi*, or spawn of the mushroom tribe, which often rise in dung Hot-beds, begins first to appear, is a certain sign that the Hot-bed, if ever so strong, is in a proper temperature both for the reception of earth and plants.

But, as we formerly noticed, slender Hot-beds, for small frames, made about two feet depth of dung, or little more, seldom require so much precaution as above, which is directed chiefly for strong beds, made three or four feet high, for large frames, to show what is often absolutely necessary to be done, for the benefit of the plants to be cultivated in them: therefore as to slender Hot-beds, as their heat is never so violent nor durable, may, according to their substance, either be earthed as soon as made, or in two, three, or four days after, as you shall judge proper by the above rules, which are most commonly mentioned in the different articles.

Observe, however, even in the strongest Hot-beds, to watch the opportunity of their proper temperature; not to lose any time, for them to waste their heat ineffectually, without being earthed, sown, or planted.

The earth for all sorts of Hot-beds should be rich and light, and of a dry temperament; but more particularly for early work in winter and spring, especially for tender plants, such as cucumbers, melons, tender annuals, &c. for very moist earth rots such tender plants while young, binds too close, and by its compactness confines the heat and steam, so as to burn at bottom, and scorch the roots of the plants; let, therefore, some light mould be always ready, drying in some airy shed, two or three weeks before-hand, for early work. See COMPOSTS.

The depth of earth necessary to be laid on these Hot-beds is according to the purposes for which the Hot-bed is designed, whether principally for sowing seed, or for the reception of plants, and according to the nature of the plants, or whether designed chiefly for plunging pots; but generally from about five

of six, to ten or twelve inches, is the common depth; observing, if for sowing seeds to raise plants for transplantation, the depth of mould may be about six inches; and if the plants are to remain where raised, to acquire their full growth, not less than from about six or eight to ten or twelve inches depth of earth will be requisite; and if for the immediate reception of plants, to remain, or for striking cuttings of any sort, &c. from about six to eight, ten, or twelve inches of mould will also be necessary; regulating the whole with proper attention, agreeably both in some proportion to the nature or size of growth of the general plants intended, and in some degree to the substance of the Hot-bed, as one of considerable strength requires and admits of having a greater depth of earth than a slender bed; and plants of larger growth remaining in the same bed to acquire perfection, as cucumbers and melons, which are not only extensive growers, but producing large fruit, requiring much nourishment, need a greater depth of mould than small salad-herbs, &c. and so in proportion to other plants, generally or occasionally raised in Hot-beds to attain perfection: but for temporary occasions just to raise a quantity of plants from seed, &c. for transplanting in young growth, a more moderate depth of earth is sufficient; and for plunging pots, containing either seed or plants, several inches of earth is necessary, according to the size of the pots, in which to plunge them, without going into the dung of the bed; therefore, according to these hints, you will readily judge of the proper depth of the earth generally necessary upon dung Hot-beds. Other particulars are exhibited under the respective articles.

In earthing the beds, be careful to cover every part of the dung within the frame therewith, especially after the plants are come up, or any planted, that no steam may rise immediately from the dung upon them; for the steam of horse-dung being of a very rank cutting nature, as is evident by its effect upon one's eyes, that if it attacked the plants, without first passing through a body of earth, would destroy most sorts it encounters in its passage from the dung; which is called steaming the plants.

With regard to sowing or planting seeds or plants in the above Hot-beds, observe, as directed for moulding the bed, that if the bed is of strong substance, and under frames, be careful neither to sow nor plant till the danger of burning is over, especially not unless the sowing or planting is performed in pots, that may be moved up as occasion requires; but at any rate it is always better to wait a

day or two, than to endanger burning good plants: do not, however, lose time when the bed is ready, for it is necessary always to have a lively heat at first to promote a quick germination in the seeds, or to strike and set the plants a-going, so as to assume a free growth at first setting off; so that, in slender or very moderate Hot-beds, the seeds and plants may be committed to the earth as soon almost as it has acquired a little heat.

And as to the method of sowing the various seeds and plants commonly raised in these Hot-beds, it being different according to the sorts, some sown on the surface and covered in with earth, others in drills, &c. all which is generally exhibited under each respective article.

In respect to the management of the Hot-beds after being sown or planted with seeds or plants, it is often different, according as the different plants may require: but take the following general hints: the seed or plants being put in, the glasses are to be continued constantly on until June or July, when the weather is become settled and warm, particularly to all the tender kinds of plants; fresh air, however, must be admitted daily, at all opportunities in mild weather, by raising the upper ends of the lights, or, if hand glasses, by propping up one side, from about half an inch to two or three inches high, according to the heat and steam in the bed, and temperature of the outward air; shutting all close in due time towards evening, and must be kept close every night during the cold weather; cover also the glasses every night with mats until June, especially for the more tender sorts of plants; one or two mats thick may be sufficient covering while the bed is in full heat: but when it decreases, you may augment the covering by the addition of another mat; never suffering the mats to hang down low over the sides of the frame and bed, as is often practised intentionally to keep out the cold more effectually; but this not only excludes the free air too much, to the great detriment of the plants, by drawing them up weak, and of a sickly yellow colour; it also promotes a rank steam, pernicious also to the health of all vegetables, and often proves the death of many of the more tender herbaceous tribe.

When the first great heat of the bed is abated, which may be in a week or fortnight after it is made, if in winter or early in spring, when cutting winds, or driving cold rains and snow may be expected, it is good culture to lay a quantity of dry long litter, straw, waste hay, or fern, round the sides of the bed, quite from the bottom, half a foot or more

thick, and as high up the frame as the earth withinside reaches: it will greatly preserve the heat in a proper temperature, and the bed will not require to be renewed so soon as it otherwise would do.

But when the heat of the bed naturally declines, or becomes of a weakly temperature, it must be renewed by adding fresh hot dung around the sides, which is called lining the bed, and is particularly necessary for all dung Hot-beds, made any time in winter or spring, until the beginning or middle of May, that are designed to continue plants any considerable time; but those Hot-beds made in May generally support a due degree of heat without lining, until the arrival of warm settled weather, as before observed. With respect, however, to linings to early beds, they may sometimes require a repetition of new linings three or four times, especially those made in winter, to continue them in a uniform heat; these linings should be of the hottest dung, and applied quite from the bottom to the top of the bed, and about fifteen or eighteen inches wide at bottom, drawing it in to about a foot wide at top, raising it four or five inches up the frame, to allow for settling, but not more; for the top of the linings, when settled, should be but very little above the bottom of the frame, lest its heat burn the earth adjoining to the frame withinside: and to prevent steam from arising too copiously from the linings, lay a stratum of earth on the top, two inches thick, continuing it close up to the bottom of the frame, that no steam may arise that way: for the rank steam immediately from dung, without first passing through a body of earth, is destructive to most plants. According as the lining settles down lower than the top of the bed, add more fresh dung, observing the precautions as above; and when the heat of the lining is exhausted, it must be renewed with a fresh quantity of dung: or some of the best of the former lining may be shaken up and mixed with a good quantity of new, and worked up in a lining, as before directed; in this manner we must continue to support the heat of dung Hot-beds as long as the aid of artificial heat is requisite for the growth of plants contained therein. See LINING.

Tanner's bark Hot-beds.

Tanner's bark Hot-beds, commonly called bark-beds, made of the material tanner's bark or tan, after having been used in the tan-vats or pits, forms the most regular, moderate, and durable heat, and greatly superior to dung Hot-beds, on several particular occasions; though not so proper for common general Hot-beds as horse-dung.

For as bark Hot-beds always require to be made in proper bark-pits formed for that purpose of brick-work, or post and planking, to confine the tan in its short loose nature; and the bark or tan not conveniently obtained in all places, is only used occasionally in the common Hot-bed manner; especially, as horse stable-dung of proper temperature for Hot-beds, is almost every where abundant, and readily obtained at less expense, or possessed by many within their own premises; and being the most conveniently eligible for common Hot-beds, as not requiring any pit like the bark-beds, is more generally adopted for all principal Hot-bed work, by common garden-frames, hand-glasses, paper-frames, &c. agreeable to the foregoing general observations and directions under the head, *Horse-dung Hot-beds.*

However, tan or bark Hot-beds, where there are proper conveniences of bark-pits, in which to make them, furnished with frames and glasses suitable, are superior in many occasions to dung Hot-beds, both in raising many early esculent productions, and various curious flowers to early bloom, as well as in the propagation and raising many sorts of tender exotics, from seeds, layers, cuttings, &c. as for instance, of esculents, may, in bark Hot-beds, raise early straw-berries and melons, which, by the regular, moderate, and durable heat of these kinds of Hot-beds, are generally obtained in great perfection at an early season; likewise, small early crops of dwarf peas, and kidney-beans, &c. and of flowering plants, many sorts may be forced in great perfection of early bloom, in bark Hot-beds, both of bulbous, tuberous, and fibrous-rooted kinds, such as hyacinths, dwarf tulip, jonquils, narcissuses, anemones, ranunculuses, pinks, and many other moderate-growing kinds; also roses, and some other small ornamental-flowering shrubs.

But tanner's bark Hot-beds are also of great utility in hot-houses, stoves, and forcing-houses, as the principal and most proper and effectual kind of Hot-beds for these different departments; in which they are commonly called bark-beds.

As however the general particulars of tanner's bark Hot-beds are fully explained under the articles BARK or TAN, BARK-BEDS, and BARK-PITS, &c. we refer the reader to those heads.

Of the different Sorts of Plants raised in the foregoing Dung and Tanner's-bark Hot-beds.

With respect to the sorts of plants, &c. commonly, or occasionally, raised in the above different kinds of Hot-beds, they are very numerous;

numerous; many of the kitchen-garden plants, a numerous tribe of flowering plants, particularly of the annual tribe, as shown under the article *Annual Flowers*; and many of the green-house and stove exotics.

Of the kitchen esculents, the principal sorts generally and occasionally raised or forced in Hot-beds, are, cucumbers,---melons,---asparagus,---strawberries, kidney-beans, peas, dwarf-beans, radishes, small-sallad herbs, and lettuce, the latter both sometimes in large plants forced to cabbaging in winter or early in spring, also sown early in spring: likewise, cauliflowers, early cabbage, and red cabbage, a small portion of each in the spring to forward them for early pricking out, especially when the winter-standing plants of these sorts have suffered by rigorous frosts, &c. or any other deficiency thereof; also, sometimes, a small portion of early celery for pricking out; and occasionally a few carrots, small white turnep-radish, and a few Dutch turneps; mint, tarragon, and tansey, basil, capsicums, love-apples, coriander, purslane; and sometimes a few early dwarf potatoes; and mushrooms, always raised in a sort of Hot-bed of peculiar construction, for those fungous plants in particular;---but it may be proper to intimate, that, of the above list of plants, the sorts which indispensably require a hot-bed in their principal culture for main crops, are the cucumbers and melons, the basil, capsicums, love-apples, and mushrooms; all the others are only raised in Hot-beds occasionally, when required to have any particular sorts in earlier perfection; some attaining mature growth for use in the Hot-beds, others for pricking out early in the spring; as all these other kinds above intimated are raised in the natural ground for the general crops.---And it may be proper to observe, that in the above and other Hot-bed work in the kitchen garden plants, Dung Hot-beds are generally most eligible and commonly adopted.

In the flowering plants, all the sorts of tender annuals are raised in Hot-beds as above, in the spring, for pricking and planting out in summer, some in pots, and others into beds and borders, as may be observed of each species and variety both in its respective genus, and the whole in one point of view under the article ANNUAL PLANTS.

And in the numerous tribe of shrubby and herbaceous exotics, both of the full ground, and more tender kinds of the green-house and stove, many sorts, in their propagation by seed, cuttings, &c. require the aid of Hot-beds in that process, to forward them to some particular degree of growth for pricking, planting, or removing to their respective departments,

as above; and as the sorts of plants requiring that assistance are very numerous, dispersed in the various different genera, they could not be conveniently inserted under this head; but every sort of that nature is intimated accordingly in its respective genus.

HOT-HOUSE, or Stove, a garden-erection or department, mostly of glass-work, wherein to have a continual regular degree of artificial heat by fire and bark hot-beds, for the culture of the most tender exotics from the hot parts of the world.

This department, in its construction, having a wall of eight or ten feet high, or more, behind, with a dwarf-wall in front and both ends, and on these low walls is upright glass-work, four, five, or six feet, and a sloping glass roof, extending from the top of the front to that of the back wall; and have internal flues for fire-heat in winter, and a capacious oblong pit in the bottom space, in which to have a constant bark-bed to furnish a continual regular heat winter and summer; so as in the whole to warm the inclosed internal air always to a certain high degree equally at all seasons, in which to preserve the most tender exotic plants from the hottest quarters of the world, Africa, Asia, and South America, all of which exotics, originally natives of those hot regions, require a similar temperature of heat in this country in our Hot-houses and stoves, by the means as above; and in which must be constant residents. Such as the *Ananas*, or pine-apple, and numerous other different species of exotics of similar tender quality, retained for variety, in their great diversity of many different growths, either curious, singular, or ornamental, and some principally for their most curious and beautiful esculent productions, as the *Ananas* before mentioned, in their admirable fruit the pine-apple, and for which the pine-plants constitute the principal furniture of many Hot-houses; though, as the same degree of heat therein requisite for the culture of the pines, is applicable to that of most other exotics natives of hot climates, many other different sorts are admitted, if but a plant or two of each, for variety.---See *Bromelia Ananas*, the Pine-apple.

But a Hot-house is also of great utility in forwarding many sorts of choice or desirable hardy plants, flowers, and fruits, to early perfection, being sown or planted in pots, and placed in the Hot-house in winter, or early in spring; the general constant heat of that department will forward them to maturity two or three months or more before their natural season in the full ground; such as kidney beans, strawberries, &c. also many sorts

of flowering plants, both annuals and perennials, of moderate growth, forwarded to early bloom; and vines planted in the outside, close to the front, the stem of each introduced through a small hole above, and the internal branches trained up under the glasses, produce grapes in May and June; or likewise, in the Hot-house, may raise early cucumbers in good perfection; and by aid of the Hot-house, the seeds, cuttings, slips, &c. of many curious tender plants, are occasionally forwarded exceedingly in their growth, by plunging the pots thereof in any vacant spaces in the bark-bed, or sometimes placed in any other most convenient part where room, and properly watered.

However, the above introductions are only mentioned for practice on particular occasions; as the general intention of a Hot-house is for the culture of the tenderest exotics from the hot regions of the West and East Indies, and many other similar hot parts, and which will not live in this country in the open air, except some particular sorts, a month or two in the heat of summer in hot dry seasons, principally in July and August, but the greater part require to be continued always in the Hot-house; consisting in the whole of many different genera, species, and varieties, all generally denominated Hot-house or stove plants; a general list of which is given under the article STOVE.

For as the Hot-house and stove may, in some measure, be considered as similar, the particulars of the construction, dimensions, list of the principal plants thereof, and general management, are fully explained under the article STOVE, which the reader is requested to see for any further information required.

HOT-WALLS, ranges of brick or stone walling, fronted with glass-work inclosing a space of several feet width, and furnished with internal fire-flues, &c. wholly for forcing fruit-trees to early production.

These Hot-walls or fire-walls generally range longways, east and west, to front the full sun; having the sunny or south-side defended with a frame-work of glass; the whole length and height inclosing a space, either of but moderate width, four or five to six or eight feet, for one row of trees behind, trained in the wall-tree order, and extended twenty or thirty, to forty, fifty, or a hundred feet length; or of more capacious width of ten, twelve, to fifteen feet and moderate length, in the forcing-house manner, to admit of a range of trained trees behind, and others of lower growth forward; and, in either or

both of which, having internal flues for fire-heat next the main wall, and continued round along towards the front glass, or sometimes ranged longitudinally along the middle-space, if no bark-pit is allotted in that part, for a bark-bed, &c. as some of these departments, under the denomination of Hot-walls, have the front inclosure of glass-work, of sufficient width to admit of forming an internal pit, four, to five or six feet width, the length of the erection; in which to make a bark-bed, or sometimes a dung hot-bed, or occasionally dung below, and tan-bark above, to assist, in conjunction with the fire heat of the flues, in warming the internal air; and each department, in either method, has a border of good mellow, loamy, or other substantial fertile earth, of proper width next the main wall, in which to plant the requisite sorts of trees; or, where no bark-bed, the whole bottom space is of good earth, either a narrow inclosure of glass of four to five or six feet, to have only a range of trees next the wall, the trees trained as wall-trees, or espaliers; or if a wider compartment, have wall-trees behind, trained to the height of the wall, and others trained in lower growth, in the internal space forward, either espalier-ways, or as small dwarf-standards, or sometimes as horizontal dwarfs, such as explained under the article DWARF-TREES.

But it should be observed, that when of wide dimensions either to admit of a bark-pit, or having the whole internal bottom space of earth with trees against the wall, and others planted forward between these and the glasses, may properly be considered as forcing houses.

And Hot-walls may be considered principally such as have narrower inclosures of glass, four to five or six feet width, containing only one range of trees, trained towards the wall upon treillis-work, if a range of flues immediately next the wall; but if all the flues are ranged forward, the trees can be trained close to the wall.

But as the Hot-walls and forcing-houses are nearly similar, in their construction, use, and general management, to forcing frames explained under that head, shall refer to the said article for the general explanation.

HUMULUS, the Hop-plant.

One species only constitutes this genus; a hardy climbing perennial, producing annual stalks, twining round any support to a great height, terminated by scaly clusters of flowers and fruit, of admirable value to the brewers, in procuring an agreeable bitter to beer, rendering it more wholesome, and keeping it from souring.

Class and order, *Diacia Pentandria*.

Charac

Characters.] CALYX, male and female flowers on different plants; the males having a five-leaved cup, and the females a quadrid, acute, general involucre, and the partial one four-leaved, and containing eight florets, each furnished with a monophyllous perianthium. COROLLA, no petals. STAMINA, five capillary filaments in the males, and oblong antheræ. PISTILLUM, in the females, a small germen, two awl-shaped, reflexed, spreading styles, and acute stigmas. PERICARPIUM, none. SEMEN, a roundish seed succeeds each female floret, lodged in the base of the calyx.

There is but one cultivated species, which admits of two varieties, the male hop—and female hop.

The species is,

HUMULUS, *Lupulus*.

(*Lupulus*)—*The Hop-plant.*] Hath a long, slender, fibry, perennial root, sending up annually several climbing, long, slender, rough, tough, purplish stalks, twining round any support fifteen or twenty feet high; adorned with large, palmated, rough leaves, on long foot-stalks, and whitish-yellow, apetalous, scaly flowers, in pendulous clusters from the sides and ends of the stalks; appearing in July, and the seed, and scaly covers, which are the Hops, ripen in August and September.

Varieties.] Male Hop-plant, bearing male flowers only, growing in long clusters—female Hop-plant, bearing female flowers only, produced in roundish, scaly, leafy clusters.

The male Hop grows wild in hedges and bank sides, and is never cultivated: its young shoots, however, in spring, prepared like asparagus, afford a palatable food.

The female Hop is the only sort that is cultivated, and admits of some varieties, by the Hop-planters termed, early white Hop—long white Hop—oval Hop—square garlick Hop, &c. and these varieties of female Hop-plants are the sorts cultivated, to produce that valuable commodity called Hop, well known to all for its excellent properties in improving all sorts of beer and ale.

These plants are rarely cultivated in gardens, except a few, by way of climbers, for variety; for they will twist round poles, or any similar support twenty feet high or more.

They are very hardy, and will grow anywhere; observing, however, those intended for a general production of Hops should have an open sunny exposure, and as good ground as possible, in any open field that produces good grass or corn, prepared for their reception by digging or ploughing; though when large quantities are cultivated for sale, ploughing is the most expeditious and cheapest tillage; and the

sets, i. e. cuttings of suckers from the root, are planted in rows, six or eight feet asunder in spring, which shoot up the same year into stalk, and produce ripe Hops in autumn; and the roots abiding for years, send up a fresh crop annually.

Propagation and Culture.

Their propagation is by cuttings of the suckers arising immediately from the roots within the ground, every part of which will grow, cutting them six or seven inches long, each having three or four buds, or eyes, for emitting shoots, and are taken from the roots of the plants of any old plantation in full perfection for bearing; being particular to chuse good sorts, and such as are good bearers, trimming each set from all parts of the old vine, and any hollow or bad part: the spring of the year, at Hop-dressing time, is the proper season for procuring the sets; that is February, March, and beginning of April; they may also be propagated by layers of the young shoots in summer, cutting off their tops at the time of laying; they will root and form sets for next spring.

It is of consequence to be choice in the sort of Hop to plant; they should be all of a sort, not early, middle, and late kinds planted together, which, by ripening at different times, would occasion great trouble in gathering.

The early white Hop comes first, is a fine Hop, but an indifferent bearer. The long white Hop is next, is a good bearer, and valuable sort. The square garlick-hop is latest, is a plentiful bearer, but a coarser Hop than the former.

March and April is the proper time for planting them.

The ground should be well digged, or else deeply ploughed, and well rough-harrowed, to break all clods, and render the surface fine and smooth; and if the ground is rather poor, some well-rotted dung, or a compost of dung and earth together, may be laid in heaps to mix in each hole.

Then having the sets ready, proceed to plant them by line, in straight rows, six or eight feet distance, and the same distance in each row, in the quincunx order. Be provided with a long line, to reach quite across the ground, and in which, at every six or eight feet, tie a knot, or small bit of rag; then stretching the line, and having a quantity of small sharp-pointed sticks, place one down at each of the marks, and in each place a hole is to be digged, a foot and a half wide, and filled up again with the earth and rotten dung, for the reception of the plants, four or five in each

each, as directed below; having thus marked out one line, remove it six or eight feet farther, placing it ~~so~~ as the marks thereon may be opposite the middle of the spaces or intervals of the first row, that the plants may stand in the quincunx form, and place the sticks as before; so on to a third, and every row to the end. But the way to have them in an exact quincunx order, is to have a triangular gauge, made with three pieces of pan-tile lath, &c. eight feet long, joined together in form of a triangle, making the ends cross each other, about an inch or two in a forked manner; then having placed one row of sticks by line, as above, remove the line to the place of the next row, apply two ends of the triangle to two of the sticks of the first row, one stick between each fork, and then plant a stick in the fork of the other end of the gauge in the second line, to form the next row; thus moving the triangle along, place it to two more sticks in the first row, as before, plant another stick in the fork of the other end, and so proceed to the end of the row, and in the same manner set out every row till the whole is completed; thus you form an exact quincunx, and the plants will also range exactly every way, and appear very beautiful when they are poled.

Then, where each stick stands, mark out, and dig a round hole about eighteen inches wide, and a moderate spade deep, breaking the earth well, casting some out, and add to the rest some of the rotten dung or compost from the heaps laid for that purpose, mixing it well with the earth of the holes, forming it in a sort of hillock in the middle of each hole; though where the soil is fresh and naturally good, there will be no absolute necessity for dung; so may only dig the holes to loosen the earth well, at the same time drawing in some of the top mould on each side round the hole, into a small hillock, the width of the hole, and two or three inches high, levelling the top, and hollow it a little; the places thus prepared in either of the above methods, are ready for the plants.

The plants, or sets, are then to be planted, four or five in each hill, with a dibble, one in the middle, and the rest round it, at four inches distance, and all nearly even with the general surface, pressing the earth close about them, and cover them over with finely-broken mould as you go on, and this finishes the work.

The plantation being thus formed, the next care is to keep it clean from weeds by hoeing: the first hoeing will be requisite in May, choosing dry weather, and, as you proceed, draw a little mould round about each hill to

form a greater body of earth immediately about the plants, continuing the hoeing during the summer as there shall be occasion.

The plants will shoot forth into vine tolerably strong, early the same year; so that in May small poles may be placed to each hill, for them to run upon, as hereafter directed, and they will produce a few hops the same year, though some do not pole them at all the first season, only twist the vine into a bunch in June, at the top of each hill, regardless of any crop, as it is apt to weaken the young plants.

The next necessary work is in spring following to dress or prune the Hops, and February and March is the proper season, when the ground is to be dug or ploughed, and the earth about the hills of plants be removed away near to the stocks or roots, clearing it quite away from the tops of the principal roots with an iron picker, for the convenience of pruning close to the head of the stock; then with a sharp knife trim off all the shoots of last year, or the remaining part of them, close to the head of the stocks or sets; clearing away also all young suckers, and directly trim in the earth around each hill, and cover the stocks with mould two or three inches thick; and this is to be every year repeated.

After this the plants will soon shoot forth into vine, or bind, when long poles, about fifteen or twenty feet in length, must be placed for them to run upon: April, or the beginning of May, when the shoots are a foot long, is the season for this work: three poles must be set to each hill, around the outside, let deep into the ground, by making holes for them with an iron crow, so as to place them with their top inclining a little outward from each other, to keep the plants from entangling, and a space between two of them be left open toward the south, to admit the sun more freely.

The Hops being thus poled, they will for the general part naturally twine themselves about the poles, observing to direct such with the hand as do not readily catch hold of themselves, turning them the way of the sun's apparent motion, and tie them loosely with dried rushes or other soft bandage, training two or three vines to each pole, and all above that should be plucked up, if the plantation be old; but if young, wrap them up together in the middle of the hills.

The next work is summer-digging, in the beginning of June, which is digging about the hills, and casting up some fine earth around, and upon each; which is sometimes repeated again the beginning of July, to make

all the hills of a proper substance, for the better nourishing of the plants.

After the plants are grown up, if you find any of them under-poled, taller poles must be placed near those that are too short, to receive the vines from them; for unless they have due length of pole, they will not yield a full crop; and if the vines are very strong and over-top the poles, it is common to strike off the heads of the shoots with a switch, whereby they throw out many lateral branches, well charged with clusters of fruit.

In July the Hops will blow, and towards the end of August will begin to ripen; the tokens of which are the bunches of fruit imparting a strong Hop-like scent, becoming dry and hard to the touch, and the brownish colour of the seed.

At these tokens of maturity, the Hops are fit for gathering, when they should be picked with all possible expedition; for a sudden storm of wind, or great rains, would do considerable damage, by breaking down the vine and discolouring the Hop.

This work of picking Hops must be performed in dry weather if possible.

A certain number of hills in a square space is to be cleared at a time, generally about eleven, and a large square bin, or wooden frame, eight feet long, by three broad, having a cloth within hanging on tenter-hooks, is to be placed in the centre to receive the Hops; then proceeding to the work of picking, cut up the vine of the above number of hills, and pull up the poles, using a wooden instrument like a lever, having at one end a forked piece of iron with teeth on the inside, which will readily raise them out of the ground; then laying two poles at a time across the bin, and two or three persons may stand on each side to pick the Hops therein, picking them very clean without leaves and stalks; and as the bin is filled, it must be emptied two or three times a day, as there may be occasion, into a hop-bag, and carried to the kiln to dry.

The kiln for drying Hops is the same as a malt kiln, covered with a hair cloth, on which they spread the Hops, which should be spread ten or twelve inches thick; and a charcoal fire is commonly used, continuing an even steady fire, not fierce, but rather increase it by degrees, and in about nine hours let the Hops be turned, and in two or three hours more, they may be taken off, by that time the brittleness of their stalks, and easy falling off the leaves, determine them to be sufficiently dried.

They are then to be carried into dry upper rooms, to lie three or four weeks to toughen;

otherwise they would become powder in bagging.

The bagging is performed in large bags made of about four ells and a half of ell-wide coarse cloth; about a handful of hops is first tied into each corner at bottom, to serve as handles; the bag is then fastened to a hole of due width in the floor, made for that purpose, having a hoop fastened to the mouth of the bag, on which it rests on the edges of the hole; then a person puts the hops into the bag, while another is continually treading them down, till the bag is full; the bag is then unfastened from the hoop, and let down; and close up the mouth, tying a handful of Hops also in each corner, as in the bottom part; they are then ready for market, &c.

The most considerable plantations of Hops in England, are in Kent and Surry, and some parts of Suffex and Hampshire, but more particularly Kent, where the Hop gardens exhibit a delightful appearance in summer, and from which counties it is amazing to see the numbers of great waggon loads daily brought to London in September and October, principally to the Borough of Southwark, where are the great magazines of them for the supply of the brewery; great quantities are also brought by water, and deposited in warehouses on both sides of the river Thames, belonging to the hop factors.

A plantation of Hops will continue in good bearing several years, provided the ground is properly manured.

The proper manure is well-rotted dung, or a compost of dung and earth together, prepared some time for that purpose; and of either, from about twenty to forty cart-loads are the common allowance for an acre; the former quantity is generally allowed when dung is scarce, laying it only along the hills of plants to be dug in in winter or spring, but the best way is to allow about forty load, and dig or plough it in any time from October till March; and such a dressing need not be repeated but once in two or three years.

Every year, after the ground is cleared from the Hops, care should be taken of the poles, which if they could be laid under any covered place, would greatly preserve them; but for want of such convenience, they are placed in parcels upright in the open air, first fixing three or six poles firmly in the ground, in a triangle manner, wide at bottom, and tied together at top; then set as many of the rest of the poles about them as shall seem convenient in each parcel.

As the poles decay, they must be recruited with new ones.

The

each, as directed below; having thus marked out one line, remove it six or eight feet farther, placing it ~~so~~ as the marks thereon may be opposite the middle of the spaces or intervals of the first row, that the plants may stand in the quincunx form, and place the sticks as before; so on to a third, and every row to the end. But the way to have them in an exact quincunx order, is to have a triangular gauge, made with three pieces of pan-tile lath, &c. eight feet long, joined together in form of a triangle, making the ends cross each other, about an inch or two in a forked manner; then having placed one row of sticks by line, as above, remove the line to the place of the next row, apply two ends of the triangle to two of the sticks of the first row, one stick between each fork, and then plant a stick in the fork of the other end of the gauge in the second line, to form the next row; thus moving the triangle along, place it to two more sticks in the first row, as before, plant another stick in the fork of the other end, and so proceed to the end of the row, and in the same manner set out every row till the whole is completed; thus you form an exact quincunx, and the plants will also range exactly every way, and appear very beautiful when they are poled.

Then, where each stick stands, mark out, and dig a round hole about eighteen inches wide, and a moderate spade deep, breaking the earth well, casting some out, and add to the rest some of the rotten dung or compost from the heaps laid for that purpose, mixing it well with the earth of the holes, forming it in a sort of hillock in the middle of each hole; though where the soil is fresh and naturally good, there will be no absolute necessity for dung; so may only dig the holes to loosen the earth well, at the same time drawing in some of the top mould on each side round the hole, into a small hillock, the width of the hole, and two or three inches high, levelling the top, and hollow it a little; the places thus prepared in either of the above methods, are ready for the plants.

The plants, or sets, are then to be planted, four or five in each hill, with a dibble, one in the middle, and the rest round it, at four inches distance, and all nearly even with the general surface, pressing the earth close about them, and cover them over with finely-broken mould as you go on, and this finishes the work.

The plantation being thus formed, the next care is to keep it clean from weeds by hoeing: the first hoeing will be requisite in May, choosing dry weather, and, as you proceed, draw a little mould round about each hill to

form a greater body of earth immediately about the plants, continuing the hoeing during the summer as there shall be occasion.

The plants will shoot forth into vine tolerably strong, early the same year; so that in May small poles may be placed to each hill, for them to run upon, as hereafter directed, and they will produce a few hops the same year, though some do not pole them at all the first season, only twist the vine into a bunch in June, at the top of each hill, regardless of any crop, as it is apt to weaken the young plants.

The next necessary work is in spring following to dress or prune the Hops, and February and March is the proper season, when the ground is to be dug or ploughed, and the earth about the hills of plants be removed away near to the stocks or roots, clearing it quite away from the tops of the principal roots with an iron picker, for the convenience of pruning close to the head of the stock; then with a sharp knife trim off all the shoots of last year, or the remaining part of them, close to the head of the stocks or sets; clearing away also all young suckers, and directly trim in the earth around each hill, and cover the stocks with mould two or three inches thick; and this is to be every year repeated.

After this the plants will soon shoot forth into vine, or bind, when long poles, about fifteen or twenty feet in length, must be placed for them to run upon: April, or the beginning of May, when the shoots are a foot long, is the season for this work: three poles must be set to each hill, around the outside, let deep into the ground, by making holes for them with an iron crow, so as to place them with their top inclining a little outward from each other, to keep the plants from entangling, and a space between two of them be left open toward the south, to admit the sun more freely.

The Hops being thus poled, they will for the general part naturally twine themselves about the poles, observing to direct such with the hand as do not readily catch hold of themselves, turning them the way of the sun's apparent motion, and tie them loosely with dried rushes or other soft bandage, training two or three vines to each pole, and all above that should be plucked up, if the plantation be old; but if young, wrap them up together in the middle of the hills.

The next work is summer-digging, in the beginning of June, which is digging about the hills, and casting up some fine earth around, and upon each; which is sometimes repeated again the beginning of July, to make

all the hills of a proper substance, for the better nourishing of the plants.

After the plants are grown up, if you find any of them under-poled, taller poles must be placed near those that are too short, to receive the vines from them; for unless they have due length of pole, they will not yield a full crop; and if the vines are very strong and over-top the poles, it is common to strike off the heads of the shoots with a switch, whereby they throw out many lateral branches, well charged with clusters of fruit.

In July the Hops will blow, and towards the end of August will begin to ripen; the tokens of which are the bunches of fruit imparting a strong Hop-like scent, becoming dry and hard to the touch, and the brownish colour of the seed.

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The

The poles may be of any wood; but the sorts commonly used are ash, birch, maple, sycamore, willow, poplar, and chestnut, the latter of which is the most durable of all.

It requires about three thousand poles to an acre, allowing three to each hill.

HURA, Sand-box-tree.

It is an exotic tree of South America, kept here in our hot-houses for variety, and for the beauty of its ample cordated foliage; producing monœcious flowers, succeeded by large swollen capsules in America, remarkable for bursting open, when ripe, with an elastic force and great explosion; and by the Americans are often used as sand-boxes, for writing desks: whence it derived the appellation Sand-box-tree.

Class and order, *Monœcia Monadelphia*.

Characters.] CALYX, male and female flowers apart on the same plant, the males in an oval amentum, each floret having a small two-leaved cup, which in the female is monophyllous and swelling. COROLLA, none. STAMINA, in the males, one set of monadelphous filaments and antheræ. PISTILLUM, in the females, a roundish germen in the bottom of the calyx, a very long cylindrical style, and large funnel-shaped stigma, divided into twelve equal segments. PERICARPIUM, a large globular, ligenous, twelve-furrowed, capsular fruit, of twelve cells, and so many seeds.

The species is,

HURA crepitans.

Crepitant American Hura, commonly called Sand-box-tree.] Hath an upright, soft, ligenous stem, dividing into a branchy head, rising twenty feet high, adorned with large heart-shaped leaves, eight or ten inches long, and near as broad, on long foot-stalks; and monœcious, apetalous flowers, the males in oval amentums, the females separate, having each a very long style, and large funnel-shaped stigma, divided at the brim into ten or twelve segments, appearing like petals, succeeded by a large round, compressed, woody capsule, with twelve deep furrows, and so many internal cells, and the like number of seeds; and when ripe, the capsules burst with an elastic force and explosion, sometimes equal to that of a pistol, discharging the seeds to a considerable distance.

The whole plant abounds with a milky juice, and the stem and branches are somewhat succulent.

This beautiful and curious exotic being a native of the hottest regions, it, in this country must always be kept in the hot-house; planting it, therefore, in pots of rich light earth, and plunge them into the bark-bed,

where the plants will attain twelve or fifteen feet stature, and frequently produce flowers; watering it sparingly in winter.

Its propagation is by seed; these are procured from abroad by the importers of seeds, generally arriving in the spring, which should be sown as soon as possible in pots of rich earth, and plunged in a bark hot-bed; when the plants are come up about three or four inches high, plant them out into separate small pots, giving water, and plunge them also into the tan-bed, or into that in the stove, retaining them always there, shifting them into larger pots occasionally. See STOVE PLANTS.

HYACINTHUS, Hyacinth, and the *Muscari*, or Musk Hyacinth.

This genus furnishes several species, and numerous fine varieties of very noted bulbous-rooted flowering perennials, producing most delicate flowers for adorning the flower-beds, borders, and other pleasurable compartments; sending up annually from the root, long, narrow leaves, and upright flower-stalks, from about half a foot to twelve or fifteen inches high, terminated by many bell-shaped, six-parted flowers, in a large erect spike; some of which are of admirable beauty and elegance, and the florist's pride, particularly that celebrated species, the *Hyacinthus orientalis*, which comprehends some hundreds of delightful varieties, all beautiful ornaments of the spring.

Class and order, *Hexandria Monogynia*.

Characters.] CALYX, none. COROLLA is monopetalous, bell-shaped, six-parted, and reflexed at top, and three small nectariums like pores, placed on the top of the germen. STAMINA, six short, subulate filaments, and connivent antheræ. PISTILLUM, a roundish, trigonous, three-furrowed germen, short style, and obtuse stigma. PERICARPIUM, a roundish, trigonous, trilocular capsule, and roundish seeds.

To this genus the botanists have joined the *Muscari*, or Musk and Grape Hyacinth, which before was always considered as a distinct genus. There are in the whole many different species of *Hyacinthus*, and of which the following are those principally retained in the English gardens.

1. *HYACINTHUS orientalis*.

Oriental, or Eastern Hyacinth.] Hyacinthus with a large, purplish, bulbous root, sending up several narrow erect leaves, eight or ten inches long; amidst them, an upright, robust, succulent flower-stalk, from about ten to fifteen inches high, adorned upward with many large funnel or bell-shaped flowers, swelling at the base, and cut half way into six parts; collected

collected into a large pyramidal spike, of different colours in the varieties; flowering in April and May.

Varieties are,] Oriental Hyacinth with single white flowers—double white flowers—red single and double flowers—flesh-coloured single and double flowers—blue single and double flowers—purple-blue single and double flowers—flesh-coloured single and double—yellow-flowered—double white with red eyes or middles—double white with purple eyes—double white with flesh-coloured eyes—double white with yellow eyes—double agate-blue—double and single porcelain-blue—double and single violet-coloured.

Of each of the above sorts, there are many intermediate varieties, amounting in the whole to some hundreds, differing from one another in some respect or other, as in the shades or tints of each respective colour; the size and position of the pips or florets, their number and mode of arrangement in each spike, the form and size of the spikes, and some other variations; all of which varieties have been obtained from seed, and by which many new ones of the above principal sorts are annually gained; each variety is, by the florists, distinguished either by the name of the place where first raised, or person who raised them, or that of illustrious personages, as the greatest kings, the bravest generals, famous poets, and celebrated ancient historians, the gods, goddesses, and the like; often bestowing such names on them as denote their value: so that in this prodigious multitude, now of many hundreds, and new ones annually acquired, to which names are given according to the fancy of the different propagators, it would be impossible to exhibit any accurate list here of any thing so variable: but the names of the capital varieties most in vogue are always to be found in most of the eminent seedsmen's catalogues; who alter or make additions according as new sorts occur.

This species of Hyacinthus and its varieties possessing a degree of pre-eminence above all the other species of this genus, are the sorts commonly esteemed and cultivated by the florists, and the sorts generally meant and understood, when we speak simply of the Hyacinth.

2. HYACINTHUS non-scriptus.

Wood Hyacinth, or Hare-bells.] Hath a small bulbous root; narrow leaves, five or six inches long; upright flower stalks, six or seven inches high; and bell-shaped, six-parted, blue flowers, revolute at top, ranged all on one side of the stalk, appearing in March and April.

Variety.] With white flowers.

Both the varieties grow wild in our woods, some pasture fields, and near and under hedges; and are cultivated in many gardens as furniture for wood-walks, wildernesses, &c. and in the common borders.

3. HYACINTHUS cernuus.

Nodding-flowered Spanish Hyacinth.] Hath a small bulbous root; narrow, erect leaves, five or six inches long; an upright flower-stalk, six or seven inches high; bell-shaped red flowers, ranged on one side of the stalk, and the top of the spike nodding or bowing downward; flowering in April.

4. HYACINTHUS amethystinus.

Amethystine-coloured Hyacinth.] Hath a smallish bulbous root; upright, robust flower-stalk, a foot high, terminated by many small, bell-shaped flowers, cylindric at the base, and cut at top half into six parts, of a deep amethystine-blue colour; flowering in February and March.

The following are the Muscari Hyacinths, distinguished by their corolla being more globular and swollen than the former sorts.

5. HYACINTHUS Muscari.

Muscari, or Musk Hyacinth.] Hath a large oval bulbous root, sending up several narrow, furrowed, thickish leaves, eight or nine inches long, ending in obtuse points; an upright flower-stalk, half a foot high, adorned with oval, reflexed, faded-purple flowers, imparting a strong musky odour.

Varieties.] With purplish flowers below, and yellow at top—and with large yellow flowers.

6. HYACINTHUS comosus.

Tufted Hyacinthus, commonly called Fair-haired Hyacinth.] Hath a large bulbous root; narrow, sword-shaped leaves, a foot long, diminishing to a sharp point; an upright flower-stalk, about a foot high, adorned with angular, cylindric flowers, terminated by a tufted cluster of oval florets, the top ones barren, of different colours in the varieties; flowering in April and May.

Varieties.] Tufted Hyacinth with purple flowers—with blue flowers—and with white flowers.

7. HYACINTHUS monstrosus.

Monstrous-flowering, or Feathered Hyacinth.] Hyacinthus with a large bulbous root, sending up several narrow, plane, smooth leaves, a foot long, ending in obtuse points; upright flower-stalks, a foot and a half high, the upper half garnished with many oval blue flowers, in tufted panicles, having finely cut feathered-like petals, mostly destitute of the parts of fructification, so never produce seeds; appearing in April and May.

8. *HYACINTHUS botryoides*.

Grape-clustered, or Grape Hyacinth.] Hath a smallish bulbous root; many narrow, cylindric, canaliculated, erect leaves, half a foot long; an upright stalk, six or eight inches high, adorned with many small, globular-ovate, closely-placed flowers, in a clustered spike in the manner of a bunch of grapes; of different colours in the varieties, appearing in April.

Varieties.] Grape Hyacinth with blue flowers—white flowers—and with ath-coloured flowers.

9. *HYACINTHUS racemosus*.

Racemous Grape Hyacinth.] Hath a middle-sized bulbous root; sword-shaped loose leaves, six or eight inches long; a flower-stalk six inches high, terminated by many small, oval, blue flowers, in a racemous cluster, closely placed at top; flowering in April.

10. *HYACINTHUS serotinus*.

Late-flowering Spanish Hyacinth.] With flowers having the exterior petals almost distinct, the interior ones coadjoined.

The flowers of all the sorts, in their characteristic or single state, consist of one hollow, somewhat bell-shaped petal, cut more or less into six parts at top; but in the double flowers, the petals are multiplied in several series, one within another, as in the double Oriental Hyacinth, the flowers of which are considerably the largest and most beautiful of all the species.

All these species of *Hyacinthus*, and their respective varieties, are hardy, bulbous-rooted perennials, of great duration in root, but annual in leaf and stalk; the leaves arising from the root in spring, and amidst them the flower-stalk; but one generally from each bulb is naked, or without leaves, and the upper part is terminated by the flowers, commonly in a sort of spike; in some extended wide at bottom, upon their pedicles, diminishing gradually to the top, in a pyramidal form, as obtains in most of the varieties of the Oriental Hyacinth; flowering principally in April and May, succeeded by plenty of ripe seed in June and July; then the leaves and stalks decay, and the roots lose their fibres, and become inactive for a month or six weeks; during which period is the time to lift the roots, as may be necessary in some sorts annually, especially the choice varieties of the Oriental kind, and in others every two or three years, to separate the increased off-sets from the main bulbs, and to transplant them into fresh prepared beds, &c. and being taken up at the above period of rest, may be kept out of ground till autumn, or even until spring

following, occasionally; though they flower strongest when planted again in October or November.

All the species and respective varieties are so hardy, as to grow freely in any of the open beds or borders in the full ground; flower and produce seed annually, and most of them increase exceedingly by off-sets of the root.

With respect to their use in gardens, all the species and varieties are proper to be employed as furniture to adorn the open borders and flower-beds; the fine varieties of the Oriental Hyacinth are commonly cultivated in beds by themselves: the common kinds of them, however, along with the other species, may also be planted both in beds separately, and in assemblage with other hardy bulbous spring flowers, in the common borders; in which disposing them in patches, three or four roots together in each patch, placing them three or four inches deep; in which mode of disposition they will effect a conspicuous variety in April and May.

Of the Oriental Kinds.

But the Oriental Hyacinth, the chief of the Hyacinth tribe for beauty, elegance, and variety, is by florists commonly deposited in beds by themselves, both for the convenience of viewing them together more commodiously, and to have occasional shelter from the rigours of winter, and during the time of their bloom; for although they are hardy enough to succeed without any protection, yet they being rather of a delicate temperature, by allowing them shelter on particular occasions, they are made to blow much larger and fairer, and the bloom continued longer in beauty; and as the fine varieties possess a degree of pre-eminence, and often purchased at a great price, it is certainly most necessary to allow them all possible assistance to blow them in perfection.

They are sold in great variety by all the seed dealers. The prices are from two-pence or three-pence, to one or several shillings per root, up to five or ten pounds, or more, for some capital varieties; and some varieties are in such high esteem among florists, that twenty or thirty pounds is sometimes given for a single bulb.

The Dutch sorts are in most esteem, that is, those that are imported annually from Holland; for those people excel all Europe in raising the greatest variety from seed, and also in blowing them in the greatest perfection, owing either to the nature of their soil or climate, in being peculiarly adapted to the growth of the bulbs; but let that be as it may, great quantities are annually imported from that country by the dealers, and sold by most of the nurserymen

ferymen and seedsmen, who have catalogues of the names of the varieties, and their prices annexed, which are various according to their sorts.

As many persons may not have inclination for cultivating the high-rated varieties, there are many of the inferior sorts that produce very pretty flowers, which may be had at moderate prices, and may be cultivated either in beds, or in the open borders, in common with other hardy, bulbous-rooted flowers, without any protection, and will blow freely, though probably not so large and elegant as those fine varieties indulged with the nice management of a professed florist, as hereafter mentioned; yet will exhibit a very beautiful bloom, and make some of the prettiest ornaments of the flower-borders.

Having once obtained some roots of any of the varieties, you may increase your stock annually by off-sets, which they, however, do not yield so freely as some other bulbs, so must make the most of every one that offers; and they all furnish plenty of seed every year, by which new varieties may be raised; for all the new sorts are always first obtained by that mode of propagation; and each respective variety so obtained, is afterwards increased by off-sets of the root. The raising them, however, from seed, is tedious in practice, for the seedling bulbs are hardly brought to flower in less than four or five years; but as by this means the stock may be greatly increased, and many new flowers acquired, it rewards for the toil, in enjoying the pleasure of seeing new varieties of one's own raising, and the stock greatly multiplied either for pleasure or profit.

The principal properties that constitute a good Hyacinth of the Oriental kind, are, the stem perfectly upright, of moderate length, and so strong and well proportioned, as to sustain the weight of the florets without bending. The florets should be large, swelling below, expanded above, and numerous, ten or fifteen at least, but are often twenty or thirty in number, and should be placed equally round the stem, the pedicles on which they grow, longer below than above, diminishing gradually in length upward, so as to represent a pyramid, each pedicle so robust as to support the florets without drooping.

Propagation, Planting, and Culture.

The propagation of all the varieties is by off-sets from the root, like other bulbous-rooted perennials (see *BULBUS*); and by seed, to obtain new varieties, both of which methods of propagation as hereafter directed. We will first proceed in their general culture.

With respect to the proper soil, situation, planting, and culture, of this celebrated species of Hyacinth and varieties,—let it be remarked that they succeed best in a light soil, and will prosper in any common earth of a garden of that temperature, but delight more particularly in moderate sandy ground; allow them, however, as light a soil as your garden possibly affords, in a dry, open, sunny situation, distant from the drip of trees; for these bulbs, if planted in strong or very moist land, are apt to rot in winter, or become diseased; if, therefore, the soil of your flower-borders or beds is of a strong, heavy quality, that part designed principally for Hyacinths may be meliorated by adding light materials, such as any light sandy earth, from the surface of some field, common, or other place (not out of deep pits), or drift or sea-sand, or any upper sandy soil, or light earthy compost; and should the soil of the borders, &c. be of a very light, sharp, sandy nature, a portion of light, mellow, loamy earth, and neat's dung, or well rotted dung of old hot-beds, will make a fine compost for the Hyacinth, being previously added long enough for the dung to be converted into mould. After all, if the common earth of the borders is of a moderately light pliable nature, as above observed, and has been occasionally manured with rotten dung, it will suit the common sorts very well, without any other preparation than good digging, &c. observing, in either case, to work the ground well one spade deep at least, if the depth of soil admits; raising the bed or border a little above the general level to avoid copious moisture; and rake the surface smooth.

But the florists generally prepare a favourite compost for their rare kinds of Hyacinths, which is principally this: light sandy loam, or any sandy earth from a pastured field or common, the top spit, not more than ten or twelve inches deep, of which about one third to one of drift or sea-sand, from the surface, and the same quantity of rotten neat's dung; mixing and casting the whole in a heap ridge-ways, in some dry sunny exposure, to lie several months at least, or if a year or more, the better (see *COMPOSTS*). But to the above materials, some add also a quantity of rotten leaves of trees, thoroughly rotten tanner's bark, or any perfectly rotten earthy wood, or rotten saw-dust; all of which together greatly improves the composition: though as these are not always readily obtained, the other compost is frequently used with great success. With either of these composts a bed is prepared in September, or early in October.

four feet wide and two deep, so that a cavity must be digged that width and depth, and filled up entirely with the composition, six inches above the common level, to allow for settling, leaving it a fortnight or a month to settle, and is then ready for the reception of the Hyacinths.

The virtuosi in these plants never plant the fine sorts two years together in the same bed or earth, without some previous renewal; for by planting them every year in a fresh bed, or fresh prepared compost, it greatly improves the size and beauty of the flowers.

The proper season for planting them is either in October, or first fortnight in November; and those then planted shoot early in spring, and flower strong at their usual season, April and May; but those planted later in autumn, or continued out of ground till January and February, for a late bloom, will flower weaker and with inferior beauty; so that the principal part should always be planted at the time first mentioned.

If it is designed to plant any of the common or more ordinary kinds, to adorn the open borders contiguous to principal walks, or lawns near the habitation, to increase the variety in assemblage with other bulbous-rooted spring flowers, as early tulips, narcissuses, anemones, ranunculuses, &c. they should be disposed towards the front, more or less, in a varied order, in patches of three roots in each, three or four inches deep; and the patches may be from about one yard to three or four distance: here let them stand to take their chance, without any further care, and they will flower in their usual season, and, in this mode of disposition, will strike the eye most agreeably among the other flowers then in bloom.

But the fine doubles and other valuable varieties are commonly deposited in beds by themselves, as we before observed, for the convenience of affording them occasional protection from inclement weather: these beds should be four feet wide, and well wrought to the depth before mentioned; and if there is any danger of water standing, or much moisture in winter, raise them five or six inches above the general level; but if dry ground, two or three inches is sufficient, finishing them gradually rounding in the middle, allowing two-feet wide alleys between bed and bed. In each bed you may plant four or five rows, lengthways, about nine inches distant in each row, and about four inches deep. As to the mode of planting, it may either be in drills drawn the above depth (see DRILL-SOWING, &c.) or by dibble, or by bedding

them in, i. e. with the spade or rake, trimming the earth evenly from off the top of the bed, four inches deep, into the alleys; then draw lines along the surface the above distance, place the roots upon the lines, bottom downwards, nine inches asunder, thrusting the bottom part a little into the earth; which being done, cover the roots over with the earth which was drawn off the bed for that purpose, as evenly as possible, to the proper depth; and as soon as they are planted, in either method, let the surface of the bed be raked smooth, and the work is done.

The bulbs being planted, the next care is to protect the choicest sorts in the beds occasionally, during winter, from severe frost, to ensure the greater success; for although the bulb itself is hardy enough, yet very intense frost is sometimes apt to affect the young new-shot fibres of the root, also the summit of the young advancing flower-bud, and occasion it to blow weaker than it otherwise would; therefore when severe frost sets in, it is easy to guard those placed together in beds; but those dispersed about the borders in patches, cannot be so readily sheltered: but they will all blow tolerably well without that precaution. Those in beds, however, may be readily protected by a covering of straw, or any kind of dry strawy litter, three or four inches thick; or may previously arch the beds with hoops or rods, or with movable arched frames of open work, and covered with mats; observing, in either mode of covering, to practise it only in severe frosts, for there will be but little danger of moderate frosts penetrating deep enough to do any hurt; nor ever permit the covering to remain a day longer than the severity of the frost continues, the free air being an important article for the welfare of the plants.

Towards spring, when the flower-buds are beginning to appear above-ground, the beds of the fine sorts, if intended to allow them all possible protection from inclement weather, should, if not done in winter, be arched over, to be covered every night with mats, particularly at the appearance of sharp frosts, or when there are cold cutting winds, being careful to take them off every morning in mild weather.

In March, or early in April, the flower-stems will advance fast in stature; according as those of the best sorts arrive nearly at their full height, it is proper to support them, by placing a small stick, fifteen or eighteen inches long, close to each plant, being careful not to thrust it into the bulb, and so tie the stems neatly to each stick, whereby the spikes of flowers,

flowers, which being heavy, would otherwise be borne down by wind or wet, will be preserved in an upright position.

When they arrive to bloom, the curious sorts that are in beds, may be preserved much longer in beauty, by being screened occasionally from the sun and rain, by a sort of awning or umbrella of mats or canvass; observing they should be shaded only from the mid-day sun from about ten to three or four o'clock, and only from excessive rains and boisterous winds; for they should enjoy the morning and evening sun, and the benefit of moderate showers; these covers are sometimes contrived like a tent, of width and height enough for company to walk under them to view the flowers, and that the plants may enjoy the benefit of free air; having the sides to let down and up at pleasure, like curtains; as also the top to draw off occasionally to admit moderate warm showers; thus may these flowers be continued in their fullest beauty three or four weeks, and exhibit a fairer bloom than those that are fully exposed.

After the flowers, however, begin naturally to fade, remove all covering entirely away, that the bulbs and increasing off-sets may receive all possible benefit from the free air.

After the season of flowering is over, the next care is to take up the bulbs, in the florists' language called, lifting the roots; for the fine sorts should be taken up at this period, both to separate any off-sets for increase, and for the benefit of the main bulbs, which will always flower stronger than such that are suffered to remain two or more years unremoved: so always take up the large, blowing roots annually after flowering.

The proper time for this work of lifting the bulbs is in summer, soon after they have done flowering, when their leaves begin to turn yellow, as then the bulbs have had their full growth for that season, and should by no means remain longer in the ground, as, if much rain should happen, they would be apt to imbibe moisture, and become spongy, and have tendency to rot after removal. Dry weather must be chosen, and a trowel, or small spade, is proper for lifting them, taking them up one and one; and break off the stem within an inch or two of its origin, which being thick and very succulent, the moisture thereof might return again into the bulb, to its detriment; then lay them in an airy room, out of the mid-day sun, to dry off the gross moisture gradually, and to ripen the bulbs to a due hardness, appearing of a purplish tinge; otherwise they are apt to rot, being more impatient

of humidity than almost any other kind of hardy bulbs.

But sometimes the florists, in taking up these bulbs as above, previous to housing them, immediately lay the choicer kinds into a raised oblong ridge of dry light earth, in a free, open situation, to remain for a week or two to plump, and to promote a more perfectly firm mature ripeness, for good keeping, by the power of the sun gradually drawing off the gross humidity more effectually, without being immediately exposed to the fierce heat thereof: though if excessive rains should casually happen at that period, it might prove prejudicial to the bulbs in some degree, by their imbibing a considerable glut of the moisture thereby occasioned; so that, to avoid this, if managed as above, they will be very well prepared for keeping many months.

When the bulbs are, however, properly ripened in either of the above methods, let them be taken up and separated from any off-sets, well cleared from earth, loose skins, and fibres at bottom; then, after exposing them a few hours in the sun, put them up in boxes singly, or upon dry shelves out of the sun, to remain till the season for planting them again; observing the same method as before directed.

Propagation by Off-sets.—All off-sets appearing about the main bulbs at the lifting season, are to be carefully separated from them, either as soon as they are taken up, or after the bulbs have lain to ripen, kept separate, and planted in September or October, in beds by themselves in rows six inches asunder, and two or three deep, where let them remain a year or two; then take them up at the proper lifting season in summer, and manage as directed for the large blowing roots.

Raising them from Seed.—The raising these bulbs from seed is practised by the curious, to obtain new varieties, as well as increase their stock; observing, that from the time of sowing, it will be four or five years before the bulbs will produce flowers; the seed ripens in June or July, which may easily be saved from your own plants, suffering some of the finest singles and half doubles to stand to ripen it in perfection.

The proper season for sowing it is September and October; and the plants will come up in spring following.

It grows freely in the open ground, in a bed or border of light earth; or if no great quantity is to be sown, it may be sown in pots or boxes, which will be convenient to move occasionally to different situations at different seasons. In either method choose light rich earth, make the surface smooth, sow

Sow the seeds evenly, and cover them an inch or an inch and a half deep; if they are sown in pots or boxes, let those be plunged to their rims in a dry place, and in November remove them either under a hot-bed frame to have occasional shelter in winter, or cover them at the approach of hard frost with some light dry litter, using the same precaution also to those sown in beds; but let them be fully exposed in all mild weather.

The plants will come up in the spring, appearing first with very small leaves; keep them very clean from weeds all summer, sift a little earth over the bed in autumn, and in winter use the same precaution as before; and in the second summer, in June, when their leaves begin to decay, take up the young bulbs, to be planted out in nursery beds, which may be done in August or September, planting them in small drills two inches deep, having the drills three or four inches asunder: here let them stand two years, sifting half an inch of earth over the surface in autumn, and give occasional covering in winter: after this they are to be taken up at the usual lifting-season, managed as the other bulbs, and planted in autumn where you design they shall flower.

Of the other nine Species.

The other nine species and varieties of this genus, Hyacinthus, though inferior to the oriental kind, are eligible, both to plant in beds, and for embellishing the common borders, &c. they effect an agreeable variety, when disposed in little clusters, in assemblage with other low spring-flowers: planting them in autumn, any time before Christmas, towards the front, three, four, or five roots in a patch, about three inches deep, and they will all flower in spring following. They may be suffered to remain unremoved two or three years, when they will be increased by off-sets into large bunches, and should then be taken up at the decay of the flowers and leaves in summer, to separate the off-sets, planting the large roots again in the borders, &c. as before in autumn; and the best of the off-sets that you may have occasion for, may be planted in nursery-beds for a year or two.

Their propagation is effected plentifully by the off-sets, as above-mentioned, which all the sorts produce in great plenty, and which may be taken up every second or third year when the leaves decay, and the off-sets separated and managed as above directed.

To blow the Hyacinths in Water Glasses, and in Pots or Boxes of Earth or Sand, in the Apartments of a Dwelling-house, and in a Hot-house, &c.

Hyacinths may be forwarded to early flow-

ering in winter and spring, by placing some bulbs thereof in root-glasses of water, or in pots, or small boxes of sand, or light, dry, sandy earth, in October, November, December, January, &c. and placed in a warm apartment of a dwelling-house, or in a greenhouse or hot-house; and, in all of which, they will blow very agreeably, earlier or later in the above seasons, according to the time the bulbs are planted and introduced in the allotted places.

The planting in the water-glasses may be done any time from October till March; the glasses for this purpose are sold at the glass-shops, and many of the principal seed-shops and nurseries, at from five to nine shillings per dozen; they are of the bottle kind, but with a straight upright body narrowing a little upward gradually to the top, where it terminates in a wide, concave mouth, to contain one root or bulb; fill them with soft, clear water, up to the neck, and a little way in the concavity of the mouth; place one bulb in each glass, with the bottom or root part a little in the water, the top upright; and set the bottles either within a warm room window, and if towards the sun, will be of greater advantage, or placed on a chimney-piece or shelves of a light room, where a fire is kept, to bring the bulbs forwarder in growth.

They will all soon put forth strong root-fibres down into the water, and push leaves and flower-buds at top, which will advance regularly for flowering in their peculiar manner; observing to renew the water occasionally when it becomes foul or fetid, discharging the old, and immediately fill up the bottles with fresh water, which is all the culture they require; and they will thus flower very agreeably in winter and early in spring, January, February, and March; observing, that when the stalks and flower-spikes are considerably advanced, should place a neat small stick to each to support them in an upright growth.

Or to obtain them in bloom at the most early period, place some glasses containing the bulbs in a hot-house or forcing-house, &c. where accommodated with such departments, and they will flower very early in great perfection.

In the above glasses the bulbs will flower in about six, eight, or ten weeks, according where placed; as those in a hot-house will generally advance soonest into flower; and in all of which, they will continue three or four weeks in bloom.

Likewise by planting some bulbs in pots or neat boxes of light earth or sand, any time in October, November, December, &c. and placed

placed as above, either in a dwelling-room, or green-house, or hot-house, &c. they will flower at an early season, but considerably sooner and the most early in a hot-house, or any forcing department under glasses, worked either by fire or bark-bed heat, &c. for this purpose, having some middling small pots, or small, neat, oblong boxes, six inches deep, fill them half way, or a little more, either with dry light earth, or with that of a sandy nature, or with sand; plant one, two, or three bulbs in each pot, according to the size; press the bottom gently into the earth, and fill up with more earth or sand, over the crown of the bulbs; or, if boxes, may plant several in each in the same manner; and, being thus planted, place the pots or boxes in any of the above-mentioned departments, the most convenient and suitable; give moderate watering with soft water, when the earth appears dry, but will be more frequently requisite to any as are placed in a hot-house, &c. in which they will flower in six or eight weeks; observing, in all of which, when the flowering is past, and the stalks and leaves decayed, take up the bulbs, clean and dry them, and may afterwards be planted in the full ground for the future year, to recover strength, and produce some good off-sets, for further propagation of the respective sorts.

The sorts of Hyacinths generally used for the above occasions, both for glasses and pots, &c. are principally any varieties of the oriental kind, especially for blowing in water; though any of the sorts may be occasionally used in each method.

In procuring Hyacinths for the above occasions, be careful to choose perfectly sound, firm bulbs, and with the root part at bottom full, plump and firm.

HYDRANGÆA, Hydrangea.

There are two species, one a shrubby, deciduous plant, three or four feet high, for the shrubbery; and the other an herbaceous, most beautiful flowering perennial for the stove; both sorts having merit for the variety and beauty of their large, cordate, simple foliage, and bunches of quinquepetalous flowers.

Class and order, *Dicandria Digynia*.

Characters.] CALYX is monophyllous, and five-parted at top. COROLLA, five roundish petals. STAMINA, ten filaments, alternately longer than each other, and roundish, didymous antheræ. PISTILLUM, a roundish germen under the corolla, two short styles, and obtuse stigmas. PERICARPUM, a roundish, didymous, bilocular capsule, crowned by the permanent styles, like two horns, and contains numerous small angular seeds.

The species are,

1. HYDRANGÆA *arborescens*.

Tree-like Hydrangea] Hath a fibrous, very spreading root; sending up several shrubby, thick, pithy, perennial stalks, three or four feet high; garnished at each joint with largish, heart-shaped, serrated, opposite leaves, on long foot-stalks; and large cymose bunches of white flowers at the top of the stalks.

It is a native of North America, is very hardy, and flowers here in July and August, but rarely produces good seeds in England.

The propagation of this species is very easy, for its spreading roots sending up many stalks, they may be slipped off with great facility in autumn or spring, with roots to each, and may be planted in the shrubbery to remain, or in nursery rows as may be convenient.

2. HYDRANGÆA *grandis*.

Great spreading-flowered Hydrangea.] Rises with a spreading root, sending up several herbaceous stalks about one to two feet high; garnished with large, heart-shaped, pointed, sawed leaves, on short foot-stalks, and very large cymose bunches of flowers at the top of the stalks, of a whitish-green colour at first coming out, but when full blown, turning to a pale reddish-white.

This plant is worthy of a place in every stove; the flowers, which come out in June and July, make a grand appearance, some of the bunches being near a foot diameter; it requires to be constantly kept in the stove, and is propagated by parting the roots in the spring, potting them and plunged into the bark-bed, and giving proper waterings.

HYDRASTIS, yellow root.

This genus furnishes a hardy perennial plant, with roundish leaves and tripetalous flowers.

Class and order. *Polyandria Polygynia*.

Characters.] CALYX, none. COROLLA, three regular, ovate petals. STAMINA, numerous compressed linear filaments, much shorter than the corolla, and topped with obtuse, compressed antheræ. PISTILLUM, a number of ovate germens collected in an oval little head, with very short styles, crowned with broad, compressed stigmata. PERICARPUM, a berry composed of oblong acini, containing oblong seeds.

There is only one species,

HYDRASTIS *canadensis*.

Canada Hydrophis, or Yellow Root.] Hath an irregular, fleshy, yellow root, from which arises one or two stalks about ten inches high, and near the bottom an indented, roundish leaf on a foot-stalk, with the upper part garnished

nished by a lesser one of the same form embracing the stalk; this is terminated by a single white tripetalous flower, which is succeeded by an acinate fruit of a bright-red colour.

The propagation of this plant is by seed sown soon after the fruit is ripe, in pots of strong earth, protecting them from the severity of winter, and in spring the plants will arise; place them in the shade till autumn, and when the leaves are decayed, plant the roots in a shady place, there to remain.

HYMENÆA, American Locust Tree.

A tender exotic for the stove, garnished with oblong, pointed leaves, and spikes of decandrous flowers.

Class and order, *Decandria Monogynia*.

Characters.] *CALYX*, a coriaceous, one-leaved cup, with a short tube, and four-parted, erect, unequal border. *COROLLA*, pentapetalous, and almost papilionaceous, consisting of a vexillum formed of the two upper petals, which are oval and sessile; the wings are also two lateral petals, and the carina is a channeled, hollowed petal below. *STAMINA*, ten very long, subulate filaments, with linear antheræ. *PISTILLUM*, a scymitar-shaped, compressed germen, with a very long, deflexed, brittle style, and thick, top-shaped stigma. *PERICARPIUM*, a large, oval-oblong, one-celled pod, containing a powdery pulp with many ovate seeds.

The species is,

HYMENÆA Courbaril.

American Locust-tree.] Rises to a large spreading tree, divided into many branches, garnished with smooth, oblong, pointed, stiff leaves, joined by pairs at the foot-stalk; and, at the ends of the branches, loose spikes of yellow, purple-striped flowers, growing two or three on short foot-stalks together, succeeded by large fleshy pods.

The resin of this tree is the Gum Anime of the shops.

It is propagated by seeds sown singly in small pots, and plunged in a hot-bed: when the plants are come up, they must be removed to the bark-bed in the stove, where they must constantly be retained.

HYPERICUM, St. John's-Wort.

This genus furnishes several hardy, deciduous shrubs, and undershrubby plants, for the shrubbery; and some tender shrubby exotics, for the green-house; all of them adorned with oblong and oval simple foliage, and pentapetalous yellow flowers in clusters.

Class and order, *Polyadelphia Polyandria*.

Characters.] *CALYX* is divided into five oval, permanent segments. *COROLLA*, five

oblong-oval, spreading petals. *STAMINA*, numerous filaments, joined in several bodies, and small antheræ. *PISTILLUM*, a roundish germen, from one to three or five styles, but most commonly three, and simple stigmas. *PERICARPIUM*, a roundish capsule, of as many cells as there are styles, and numerous oblong seeds.

There are about six or seven species commonly retained in the English gardens as plants of ornament, four of them hardy, and three tender.

Hardy Kinds.

1. *HYPERICUM hircinum*.

Stinking St. John's-Wort.] Hypericum with several shrubby, two-edged stalks from the root, three or four feet high, branching by pairs opposite at every joint; oblong-oval, close-fitting, opposite leaves; and at the ends of all the young shoots, clusters of yellow flowers, having the stamina longer than the petals, and three styles.

The whole plant has a strong disagreeable odour.

Varieties.] Stinking St. John's-wort, with strong stalks, six or eight feet high, broad leaves, and large flowers—inodorous St. John's-wort, with strong stalks, broad leaves, and without any disagreeable odour—with variegated leaves.

All these varieties are shrubby, flower in June and July, in such numerous clusters, that the shrubs appear covered with them, and produce abundance of seed in autumn.

2. *HYPERICUM canariense*.

Canary St. John's-Wort.] Hath shrubby stalks, dividing and branching six or seven feet high, oblong, close-fitting leaves, by pairs; and at the ends of the branches, clusters of yellow flowers, having the stamina longer than the corolla, and three styles; flowering in June and July.

3. *HYPERICUM Ascyrum*.

(Ascyrum Magniflorum.)—Great-flowered, Dwarf American St. Peter's-Wort.] Hath very spreading roots, sending up numerous, slender, four-square stalks, a foot long; oval, spear-shaped, close-fitting, smooth leaves, by pairs opposite; and at the ends of the stalks, large yellow flowers, having five styles.

4. *HYPERICUM Androsæmum*.

(Androsæmum.)—Tutsan, or Park-leaves.] Hath an upright, under-shrubby stalk, two feet high, branching by pairs opposite; oval, heart-shaped, close-fitting leaves, by pairs; and from the tops of the stalks, clusters of small yellow flowers, having three styles; and roundish, berry-like, black capsules; flowers in the end of July and August.

It

It grows naturally in woods in many parts of England; &c.

Tender Green-house Kinds.

5. *HYPERICUM balearicum.*

Balearican, warted-leaved Hypericum.] Hath a shrubby stalk, branching two feet high, with reddish scarified branches; small, oval, waved, close-sitting, semi-amplexicaule leaves, warted underneath, and large yellow flowers, having five styles; flowering great part of the year. Is a native of Majorca.

6. *HYPERICUM monogynum.*

One-styled China Hypericum.] Hath shrubby, purplish stalks, about two feet high; oblong, stiff, smooth, close-sitting leaves, of a shining green above, and white underneath, and clusters of small yellow flowers, with coloured cups, and only one style; flowering most part of the year.

The flowers of all these species of *Hypericum* appear principally in June, July, and August, and some in the green-house, most part of the year, in numerous clusters, mostly from the ends of the branches and young shoots, succeeded by oval capsules, containing plenty of seeds in autumn, especially in the hardy kinds.

All the species demand attention as plants of ornament, having great merit in their flowers, appearing very conspicuous in long succession.

The hardy kinds are good furniture for all the shrubbery compartments, and will grow in any situation and exposure, and in any common soil of a garden, will endure the severest cold, and greatly ornament the shrubbery in summer; more particularly the first and second sorts and varieties, which are more of a shrubby durable growth, than the other two hardy kinds; but all the sorts merit culture to increase the variety. All of which are sold cheap enough at the nurseries, and may be easily increased by suckers, by slips of the root, and by seed. See their *Propagation*.

The tender species being natives of warm countries, must be potted to have shelter in winter in the green-house, and will effect a pretty variety among the other tender exotics.

Propagation, &c. of all the Sorts.

The first two hardy sorts propagate very fast by suckers, from the root, which are sent up plentifully every year, and in autumn or spring may be readily slipped off from the old plants, with roots to each; or the whole plant may be taken up and divided into as many parts as there are suckers and slips with roots, planting the strongest where they are to remain, and the weakest in nursery rows for a year to acquire strength.

They may also be propagated by seeds, sown

in autumn in a bed of common earth, in drills an inch deep; the plants will rise plentifully in spring, and be fit to transplant the spring following.

The other hardy sorts are also easily propagated by slipping the roots in autumn, or early in spring; and may likewise be raised in great plenty by seeds, as directed for the two former.

The two tender species are propagated by layers, and by cuttings. The laying is performed in spring on the young shoots, which will be well rooted by the end of summer; then plant each in separate pots. And cuttings of the young shoots may be planted any time from March till June, in pots, and plunged in a hot bed; they will readily emit roots and form plants.

The Monogynous *Hypericum* may likewise be propagated by slipping the roots in spring.

These sorts may also be raised from seed sown in spring, in pots, and plunged in a hot-bed, just to bring up the plants.

HYPERICUM Frutex. See *SPIRÆA*, it being a species of that genus.

HYSSOPUS, Hyssop.

The Hyssop of our gardens is a low under-shrubby perennial, a fine aromatic, and medical plant.

Class and order, *Didynamia Gymnospermia.*

Characters.] *CALYX* is monophyllous, oblong, five-parted, and permanent. *COROLLA* is monopetalous and ringent, having the upper lip plane, roundish, emarginated and erect; the under one trifid, with the middle segment long and acute, and the side ones short and obtuse. *STAMINA*, two long and two short filaments, and simple antheræ. *PISTILLUM*, a four-parted germen, slender style, and bifid stigma. *PERICARPIUM*, none; four oval seeds lodged in the calyx.

There are several species, but not more than one commonly cultivated, viz.

Hyssopus officinalis.

Officinal, or Common Hyssop.] Hath under-shrubby, low, bushy stalks, growing a foot and a half high; small spear-shaped, close-sitting, opposite leaves, having several smaller rising from the same joint; and all the stalks and branches terminated by erect, whorled spikes of flowers, of different colours in the varieties.

Varieties.] Common blue-flowered—white-flowered—red-flowered—long-spiked—with deep blue flowers—curled-leaved—striped-leaved.

All these varieties are under-shrubby, having ligneous durable stalks and branches, and

all produce numerous small flowers in whorls round the upper part of the stalks for a great length: each flower is of one petal, of the ringent or grinning kind.

They are very hardy plants, of great estimation as aromatics, and for medical purposes, and the common blue-flowered kind is the sort chiefly used, and which is generally cultivated in the kitchen garden, sometimes in close rows, by way of edgings to beds or borders, clipping them annually to keep them regular and within due compass (see EDGINGS); and sometimes are disposed in beds, &c. in rows fifteen or eighteen inches asunder, and the same distance between the plants in each row. The young leafy shoots and flower-spikes are the parts proper for use, and may be cut any time when wanted; observing, however, their season of perfection, for any general medicinal use, is in summer, when they are in flower; at which time the flower-stalks should be cut down for use, and tied in bunches.

But all the varieties may also be employed to adorn the borders, and other parts of the pleasure-garden, disposing them here and there singly to form bushy plants.

Their propagation is by seed, by slips, and by cuttings.

By Seed.—In March or April sow the seed in a bed or border of light earth, and rake it in; and when the plants are come up, thin them, if too close, and when about three or four inches high, plant them out where they are to remain; or when it is designed to form an edging of them, the seed may be sown at once where the plants are to remain, in small drills, and covered half an inch deep.

By Slips and Cuttings.—In March, April, or May, slip or cut off a quantity of the robust side-shoots, plant them in a shady border, five or six inches apart; give water as soon as planted, repeat it occasionally, and they will soon strike root, and in autumn may be planted out where they are always to stand.

J.

J A C

JACQUINIA consists of a genus of shrubby exotics for the stove, garnished with oblong, and lanceolate leaves and scented flowers.

Class and order, *Pentandria Monogynia*.

Characters.] **CALYX**, a cup composed of five roundish, concave, persistent leaves. **COROLIA**, monopetalous, with the tube bellied, and bell-shaped, and the border cut into ten segments, five of which are shorter. **STAMINA**, five subulate filaments inserted in the receptacle, topped with halberd-shaped antheræ. **PISTILLUM**, an oval germen; style the length of the stamina with a capitated stigma. **PERICARPIMUM**, a roundish, pointed one-celled berry, containing a cartilaginous round seed.

The species are,

1. *JACQUINIA armillaris*.

Blunt-leaved Jacquinia.] Hath a shrubby, prickly stem, branching four or five feet high, garnished with oblong, obtuse-pointed leaves, and white sweet-scented flowers in long bunches.

2. *JACQUINIA ruscifolia*.

J A S

Ruscus-leaved Jacquinia.] Hath a shrubby, branching stem, rising eighteen or twenty inches high, garnished with small, spear-shaped, sharp-pointed leaves, and flowers in bunches.

These plants, being natives of the warm parts of America, require the aid of a stove in this climate. They are propagated by sowing the seeds on a hot-bed, or from cuttings of the young shoots, and treated as other stove plants of the like nature.

JASMINUM, Jasmine, or Jessamine-tree.

The plants are of the shrub kind, mostly of somewhat trailing growth, consisting of three hardy deciduous flowering-shrubs for the open ground, and four tender ever-green flowering-shrubs for the green-house, adorned with pinnated and trifoliate leaves, and numerous monopetalous, tubular, five-parted flowers, which, in most of the species, are of admirable fragrance.

Class and order, *Diandria Monogynia*.

Characters.] **CALYX** is monophyllous, tubulous, five-parted at the brim, and permanent.

manent. COROLLA is monopetalous, and faucer-shaped, with a long cylindric tube, and with the limb or upper part, divided into five segments. STAMINA, two short filaments, and small antheræ. PISTILLUM, a roundish germen, slender style, and bifid stigma. PERICARPIUM, an oval, bilocular berry, and two large oval arillous seeds.

Hardy Deciduous Kinds.

1. JASMINUM *officinale*.

Common White Jasmine.] Jasminum with shrubby; long, slender stalks and branches, rising upon support fifteen or twenty feet high; pinnated opposite leaves, of about three pair of sharp-pointed folioles, terminated by an odd one, running out to a long point; and numerous white flowers from the joints and ends of the branches; of a very fragrant odour.

Varieties.] With white-striped leaves—yellow-striped leaves.

All the varieties flower in great profusion most part of the summer; the flowers are white, and remarkable for their great fragrance; but are never succeeded by fruit in England.

2. JASMINUM *fruticans*.

Shrubby Yellow Jasmine.] Hath shrubby angular, trailing stalks and branches, rising upon support eight or ten feet high; trifoliate and simple alternate leaves; and yellow flowers from the sides and ends of the young branches, appearing in June; frequently producing berries, of a black colour.

This species is remarkable for sending up many suckers from its roots, often so plentifully as to overspread the ground, if not taken up annually.

3. JASMINUM *humile*.

Dwarf Yellow Jasmine.] Hath shrubby firm stalks, and angular branches, of low, somewhat robust, bushy growth; broad trifoliate and pinnated leaves; and large yellow flowers in July, sometimes succeeded by berries.

The above three species are natives originally of distant countries; the first of India, the others of the southern parts of Europe, but are all hardy enough to grow here in the open ground, and have been many years inhabitants of our gardens.

Tender Green-house Kinds.

The following four species are natives of different parts of India, but succeed here with only protection from frost, and will sometimes live in the open air all the year, against a warm wall; it is, however, proper always to keep the principal part in pots to move to a green-house in winter.

4. JASMINUM *grandiflorum*.

Great flowered Catalonian Jasmine.] Hath

a shrubby, firm, upright stem, branching out into a spreading head, from about three to six or eight feet high; pinnated ever-green leaves, of three pair of pointed lobes, terminated by an odd one; and large flowers, of a blushed without, and white within; flowering from July till November.

Variety.] With semi-double flowers, having two series of petals.

5. JASMINUM *azoricum*.

Azorian White Jasmine.] Hath shrubby, long, slender stalks and branches, rising upon support fifteen or twenty feet high; trifoliate, opposite, ever-green leaves; and largish pure white flowers, in loose bunches from the ends of the branches, appearing most part of summer and autumn.

6. JASMINUM *odoratissimum*.

Odoriferous, or most Sweet-scented Yellow Indian Jasmine.] Hath a shrubby upright stalk, branching erectly without support six or eight feet high; large, trifoliate, shining, alternate, ever-green leaves, having oval lobes, and the middle lobe the largest; and bright-yellow flowers in bunches from the ends of the branches; flowering from July till October, and emits a most fragrant odour.

7. JASMINUM *Sambac*.

(Sambac)—or Climbing Arabian Jasmine.] Hath a shrubby, weak stem, straggling, and numerous mounting upon support ten or twelve feet high, heart-shaped, obtuse leaves, and oval-acute ones above, about three inches long and one broad, placed by pairs opposite; and from the upper axillas and ends of the branches, small clusters of pure white, very fragrant flowers great part of the year.

Varieties.] With double flowers, and oblong borders shorter than the tube—with large double flowers and roundish borders longer than the tube.

Most of the above species of Jasminum have long, slender, declinated branches, producing many very long, weak, green, pithy shoots annually, and from which the flowers are commonly produced.

The flowers of all the sorts consist of one petal, long and tubular below, and divided at top into five spreading segments. See the *Characters*.

Culture of the Hardy Kinds.

The three hardy kinds are proper furniture to adorn the pleasure-garden; but their branches being mostly long, slender, and of declinated growth, require support, especially the *Jasminum officinale*, which is most commonly planted against walls and other fences, both for the convenience of training them, and to ornament the places with their pro-

fusion of flowers in summer. But this and the other two hardy kinds may also be stationed in shrubberies, training them with upright single stems, half a yard or a yard high, to stakes; and as they will branch out each way, by trimming the long straggling shoots occasionally every spring and summer, they may be made to form bushy heads: those planted against fences should be pruned down low at first, to force out lower lateral shoots, so as to furnish every part from the bottom upward, and every year a due quantity of the strongest shoots in every part are to be trained in, close to the wall, &c. previously shortening them, more or less according to their strength; but always cut low enough to take off the weak, straggling, soft parts, and nail them in straight, about four to six inches apart; and as, in summer, numerous shoots are sent forth from all the branches, and from the upper parts of the smaller shoots the flowers generally arise; so that at this season the rudest growing shoots may be reduced to regularity, generally with a knife, rather than garden shears as sometimes practised; observing, however, not to prune too close, to cut off the parts that produce the flowers; which, by knife-pruning, will be the most effectually preserved; and is most eligible; by which you may train the whole always regular at the above distance, like a wall-tree; in summer, cutting out all the most irregular rambling shoots, and train a quantity of the best-placed principal ones close to the wall, to remain till winter or spring pruning; when selecting some of the strongest in different parts to be trained as above hinted, at the same time cutting out all the superabundant and weak shoots, close to the old wood, so as to preserve all the branches distinct at regular distances, in the manner of a wall-tree; being careful always to leave every year some of the strongest young shoots at proper intervals, below and above, in vacant spaces, to furnish flowers in every part, and to supply the place of any decayed, or long, naked old wood, which should be cut away occasionally in the winter or spring pruning, and its place supplied with young shoots; and observing in this, the winter pruning, that the general supply of young wood then retained should be mostly shortened agreeable to the intimations above.

Culture of the tender Kinds.

The four tender species requiring shelter of a green-house in winter, must always be kept in pots, to move them in and out occasionally; let them be potted in rich light earth, frequently watered in summer, and about once a week

in winter, but always moderately during that season; prune off all decayed wood, at any time when it appears; and shorten, or retrench the rambling shoots as you shall see occasion, to preserve the heads somewhat regular; managing them in other respects as directed for other green-house shrubs. See GREEN-HOUSE PLANTS.

A plant or two of each of these tender species may also be planted against a warm wall, trained thereto, and left to take their chance, with only occasional shelter of mats in frosty weather.

Propagation of all the Sorts.

The three hardy sorts are easily propagated in great plenty by layers and cuttings. Lay a quantity of the strong young shoots in autumn, winter, or spring, trimming their tops, and they will be well rooted by autumn following: at the same seasons, cuttings of the strong shoots, in lengths of ten or twelve inches, planted in a shady border, will be rooted and fit to transplant by next autumn. The *Jasminum fruticans* may also be propagated by suckers, which it sends up in great plenty; and these being taken off will make good plants.

The striped varieties of the first species are also propagated by grafting or budding in stocks of the common kind.

The four tender species may also be increased by layers in March or April: chusing the young wood, make a slit at a joint underneath in each layer, shortening the tops, and lay them in the usual way; give plenty of water all summer: they will be properly rooted by autumn, when each layer is to be separated from the parent, and planted singly in pots, and placed among the other green-house exotics.

These four green-house kinds are also very commonly propagated by grafting and budding them upon the common white, and shrubby yellow Jasmine.

They are also raised from seeds, more particularly the Azorian Jasmine, and *Jasminum odoratissimum*. Sow the seed in March or April, in pots of light rich earth, an inch deep, and plunge the pots in the earth of a moderate hot-bed under frame and glasses; refresh them with frequent sprinklings of water, and the plants will rise in five or six weeks, or in a little more or less time, when fresh air must be admitted daily, by tilting the lights, giving also frequent waterings; and towards the middle or latter end of May, begin to inure them to the full air, and remove them into it fully in June, to remain till October, then moved into the green-house for the winter; and in March or April following, transplant

plant them into separate small pots, and managed as other green-house shrubs.

JATROPHA, Cassada, or Cassava-plant, &c.

This genus furnishes shrubby, elegant, flowery perennials, natives of the warm parts of America, and retained here in hot-houses for variety; growing with durable stems and branches, in erect growth, from about a yard to eight or ten feet high; adorned with divided palmated leaves; and monœcious, monopetalous hypocrateriform males, and quinquepetalous female flowers.

Class and order, *Monœcia Monadelphia*.

Characters.] **CALYX**, monœcious flowers, having a very small cup to the males, and none to the females. **COROLLA** is, in the males, monopetalous, hypocrateriform, five-parted and spreading; and, in the females, consists of five rose-like petals. **STAMINA**, in the males, ten erect united filaments, five of them alternately shorter, and roundish versatile antheræ. **PISTILLUM**, a roundish trifurcated germen, three forked styles, and simple stigmas. **PERICARPIUM**, a roundish, trilocular, tricoccus capsule, and three roundish seeds.

There are several species, of which the following are those generally retained here in our hot-houses.

1. **JATROPHA Manihot.**

(*Manihot*)—or *Esculent Jatropha*, commonly called *Cassada*, or *Cassava*.] *Jatropha* with a thick fleshy root; an upright, thick, woody, pithy stalk, rising six or seven feet high; palmated leaves, of seven spear-shaped, smooth, entire lobes, five or six inches long, all uniting at their base, and spread out like an expanded hand; and male and female yellow flowers in umbels at the top of the stalk and branches, succeeded by three-furrowed capsules containing the seeds.

The root of this plant, though of a poisonous quality, serves for bread to most of the inhabitants of the West Indies, being first divested of its poisonous juice by expression; it is prepared by rubbing the root forcibly upon a strong copper grater, till reduced to a rough saw-dust-like powder, or meal, is then put into a press to squeeze out the poisonous juice, and being sufficiently pressed and sifted, is made into bread, by spreading it two or three inches thick, upon an iron plate heated over the fire, and thus the parts join, incorporate, and become cake bread, which is accounted very nourishing; and if the meal is put into soup, it swells up considerably, which seems to prove its great abundance in substance.

Great quantities of this sort are cultivated

in all the West-India islands for the above purposes.

2. **JATROPHA urens.**

Stinging Prickly Jatropha.] *Jatropha* with a thick fleshy root; an upright, ligneous, prickly, pithy stalk and branches, rising five or six feet high; palmated leaves, of five sinuated lobes, armed with stinging spines; and white flowers in umbels from the ends of the branches.

3. **JATROPHA gossypifolia.**

Gossypium-leaved Jatropha.] Hath a woody, branching stalk, rising four or five feet high, set with clusters of bristly hairs; leaves divided into oval, entire lobes; and dark purple flowers growing in umbels at the ends of the branches.

4. **JATROPHA multifida.**

Multifid-leaved, Scarlet Jatropha.] Hath a thick, woody, pithy stalk, branching eight or ten feet high; large, many-lobed leaves, having the lobes multifid or jagged into many points; and bright scarlet flowers, growing in umbels at the ends of the branches.

All these species of *Jatropha* are durable in root, stalk, and branches; the stalks are woody, generally very thick, somewhat succulent, and full of a white pith and milky juice; the leaves very large and elegant; and the flowers produced in large umbels, having male and female in the same umbel; the males are of one salver-shaped petal, and the females are of five petals, expanding in form of a single rose; they flower here annually in summer, and are frequently succeeded by ripe seeds, which are contained in roundish three-lobed capsules of three cells, having one seed in each cell.

As all the sorts are natives of the warmest parts of the world, they require a hot-house to preserve them in this country, so must be potted in pots of good light earth, and always continued in the stove, where they will exhibit a fine variety with their large elegant foliage, and umbellate flowers.

They should be always but moderately watered, especially in winter; for being mostly replete with a milky juice, much moisture might rot them.

Their propagation may be performed by seed, and cuttings.

By Seed.—The seed frequently ripens here, and is also imported annually from the West Indies, &c. which should be sown in spring, in pots of rich light earth, and plunged in the bark-bed, where the plants will soon come up; and when a few inches high, prick them in separate small pots, give a little water, and plunge them also in the bark-bed.

By

By Cuttings.—In spring or summer; cuttings of the stalks and branches, six or eight inches long, planted in pots; and plunged in the bark-bed, will put out roots, and become proper plants.

IBERIS, Candy-tuft, or Scitica Cress.

This genus comprehends hardy, herbaceous, low, flowery annuals and perennials for the borders, and under-shrubby perennials for the green-house; all of branchy bushy growth, from about six inches to a foot and half high; garnished with narrow entire leaves, and terminated by umbels of tetrapetalous flowers.

Class and order, *Tetradynamia Siliculosa*.

Characters.] CALYX, four small, oval, deciduous leaves. COROLLA, four oval, spreading, unequal petals, the two outer ones longest. STAMINA, four long and two short filaments, and roundish antheræ. PISTILLUM, a roundish, compressed germen, short style, and obtuse stigma. PERICARPIUM, a roundish, compressed, bilocular capsule, and two oval seeds.

The species cultivated in our gardens are, three hardy herbaceous annuals, and a perennial, and three tender shrubby perennials.

Hardy Herbaceous Annual Kinds.

1. IBERIS *umbellata*.

Umbellated Iberis, or Common Candy Tuft.] Iberis, with herbaceous, short, round, very branchy stalks, of tufty growth, from about six to eight or ten inches high; small spear-shaped leaves, the lower ones serrated, the upper entire; and all the stalks and branches terminated by umbellate clusters of flowers, of different colours in the varieties.

Varieties.] With white flowers—with red flowers—and with purple flowers—crimson-flowered.

All the varieties flower in June, and by different sowings may be made to flower to the end of summer; they were introduced to our gardens from Candia; hence the name Candy Tuft.

2. IBERIS *amara*.

Bitter Candy Tuft.] Hath herbaceous, short, round, very branchy stalks, of bushy growth, from about eight to ten or twelve inches high; small, spear-shaped, slightly-indented leaves; and all the branches terminated by racemose bunches of white flowers in June and July, &c.

Both these species and varieties are very hardy annual flowers, rise freely in the open ground, should generally be sown in patches, and by different sowings from March till Midsummer, they will afford a succession of bloom from June till September, and produce great plenty of seeds.

3. IBERIS *odorata*.

Odorous Sweet-scented Iberis.] With linear leaves, enlarging above, sawed; and white flowers in umbels.

4. IBERIS *rotundifolia*.

Round-leaved perennial Iberis.] With ovate-roundish, juicy, and embrace the stem; flowers in racemous bunches.

The above four species are all low plants, of bushy growth; producing numerous small flowers in umbellate clusters, and racemous tufts, which, together, make a very conspicuous appearance in May, June, and July; of which the *Iberis umbellata*, and varieties, are the common Candy Tufts, noted among the hardy annual flowers, proper for sowing in borders, beds, pots, as very ornamental flowering plants; though rather of short duration, of about three or four weeks' continuance in full flowering; the other annual kinds are also hardy, but less known; and the *Iberis rotundifolia* is a low perennial flower for the borders.

Shrubby Perennial Kinds for the Green-house.

The three following low under-shrubby species being natives of Candia, and other warm parts, require shelter of a green-house here in winter.

5. IBERIS *sempervirens*.

Ever-green Shrubby Iberis, commonly called Tree Candy-Tuft.] Hath low under-shrubby stalks, very branchy and bushy, growing but ten or twelve inches high; very narrow, acute, entire leaves, remaining all the year; and white flowers in umbels at the ends of the branches, appearing great part of the summer.

6. IBERIS *semperflorens*.

Ever-flowering Shrubby Iberis.] Hath low under-shrubby stalks, very branchy, spreading and bushy, growing a foot and a half high; wedge-shaped, obtuse, entire, ever-green leaves; and white flowers in umbels, at the ends of the branches, appearing at all times of the year.

Variety.] With white-striped leaves.

7. IBERIS *gibraltarica*.

Gibraltar Candy Tuft.] Hath branching shrubby stalks, oblong leaves, dentated at top, and the branches terminated with large umbels of purple flowers, appearing the greatest part of the summer.

The flowers of all these plants consist each of four small petals, are very numerous, terminating all the branches in umbellate clusters, so conspicuously, that the plants appear covered therewith; succeeded by abundance of seed in the annual sorts; but the shrubby kinds rarely produce any here.

The annual species make a pretty appearance

ance when disposed in patches in the flower-borders, sown in spring where they are finally to remain; but as they continue only two or three weeks in beauty, it is proper to perform three or four different sowings from February or March until June, to have a succession of bloom to the end of summer. Sow about half a thimbleful of seed in each patch of about five or six inches diameter, covering them with fine earth, near half an inch deep; and when the plants are an inch high, thin them to about six in each patch, that they may have room to branch and spread; whereby they will flower stronger, and continue longer in bloom, than if left thick.

The perennial fort, *Iberis rotundifolia*, merits a place in assemblage with other border flowers, to increase the variety; and may be propagated by root-off-sets, and by cuttings of the stalks, &c.

The three tender, shrubby, perennial kinds are naturally of low bushy growth, durable in root, stem, and branches, ever-green, and very floriferous, and merit admittance in every green-house collection, both as ever-greens, and for the beauty of their flowers almost throughout the year. They being impatient of frost, must be potted to move to shelter in winter; potting them in any good light earth, and place them in a green-house or garden-frame in winter. A few plants of each may also be planted in the full ground, in a dry, sheltered, sunny situation to take their chance, and will frequently stand tolerably well the year round, with only a light covering of long strawy litter in hard frosts.

The propagation of these three shrubby kinds, and variety, is easily effected by slips and cuttings, from three to five or six inches long, planted any time from March till July, either in a hot-bed or natural earth, affording them shade and water, and they will readily put out roots, and be fit for potting towards the end of summer.

ICE HOUSE, a building sunk in the ground, serving as a repository to preserve Ice till summer, for various family uses; the management of which generally belongs to the gardener.

This building is constructed like a well, mostly sunk in the ground as above observed, eight, ten, or twelve feet deep, walled with brick or stone, arched over at top, having a small door on the north-side, and over all a slated or thatched roof. The place for this building should be generally in some by-part of the garden, or some convenient place contiguous thereto; chusing a dry elevated situation, both that the Ice may not be liable to be

melted by copious moisture; and that all moisture running from the Ice may readily drain off. It would be of much advantage if it could be contrived on or near the side of some hill, or sloping ground, where the base of the slope is lower than the bottom of the well of the building, for the more effectually draining off the moisture; let it, however, be contrived in as dry a place as possible, and so much elevated as the water may be easily carried off by drains to some lower ground; and should be in a part either within or contiguous to the garden, where carts can readily bring in the Ice in winter.

The place being fixed on, a well must be digged, eight or ten feet diameter, and as much in depth, or more; observing if the situation fixed on is somewhat elevated, and the ground of a dry, gravelly, or sandy nature, not retentive of moisture, the pit or well may be wholly sunk below the general surface; but if rather low, or moist ground, it is advisable to have the well raised as much above the surface as the moisture may easily drain away. Having formed the cavity or pit of the well, then at bottom should be formed a hollow space for a drain, two feet deep, the sides walled with brick or stone, having at top a grate framed with strong wooden bars; from the bottom of this drain must be a small underground drain, to conduct the moisture quite away from the building. The sides of the main well must be walled round with brick or stone, two feet thick at least, and carried up to a proper height, leaving, near the top, on the north-side, a space two feet and a half diameter, for the admission of the Ice, &c. and terminate the wall all round with a strong thick arch of the same materials carried over the top; and there should be another wall proceeding from within three feet below the top of the other, raising it also with an arch over the top of the first, leaving likewise a place for entrance; or, if this outer wall is not arched, raise upon it a wooden roof slated, tiled, or thickly thatched; observing, if slated or tiled, a foot thickness of reeds or straw under it is proper, the better to exclude all air and heat of the sun; and from the door or mouth of the well, should be a porch continued a yard and a half outward, and one or two wide, walled on the sides, and arched at top, and a door at the outer end; and both the inner and outer doors made to shut perfectly close. The building thus far advanced, may then bank up earth around the outside wall, the better to defend the Ice from all external causes, and finish with a coat of turf laid neatly all over the banking.

If the building is finished betimes in the summer, it will be dried enough for the reception of the Ice the following winter.

Therefore in winter take the opportunity of the first Ice, when about an inch or two thick; load it in carts, and bring it to the Ice-house, shooting it down at the outer door; then, after having laid some clean straw, reeds or faggots of brush-wood at the bottom of the well upon the wooden grate, cast in the Ice, breaking it small, and ramming it close from time to time, that it may cement into one solid mass; observing, as you proceed, to lay some clean straw all around next the wall, if possible, to preserve a vacancy to give passage to any moisture that may proceed from the top of the Ice.

As soon as the well is thus filled with Ice, shut the inner door, which should be thick, close, and made to fit exactly; then let all the vacant space between that and the outer door be closely filled with straw, and then shut the outer door as close as possible.

Thus the Ice will be preserved till summer, and, if the house is perfectly air and moisture tight, will keep two or three years.

When the Ice is to be taken out for use, be careful, in going in, always to shut the outer door before the inner one is opened; and as the Ice will be all incorporated to a solid lump, you must have an iron instrument always in readiness to break it up, taking out no more at a time than is wanted.

ILEX (formerly *Aquifolium*), the Holly-tree.

This genus furnishes hardy ever-green trees of great beauty and value, being proper both for useful and ornamental plantations; obtain twenty or thirty feet stature, adorned with long, spinous, and serrated ever-green leaves, and short clusters of monopetalous, four-parted flowers, succeeded by bunches of beautiful red berries in autumn and winter.

Class and order, *Tetrandria Tetragynia*.

Characters.] **CALYX** is small, indented in four parts, and permanent. **COROLLA** is monopetalous, and deeply divided into four roundish segments. **STAMINA**, four short filaments, and small antheræ. **PISTILLUM**, a roundish germen, no style, but four obtuse stigmas. **PERICARPIMUM**, a roundish, quadrilocular berry, and four oblong, hard seeds.

There are but three species of *Ilex* common to the English gardens:—the common Holly—Dahoon Holly—and Yapon; but of the former are many fine varieties.

The species are,

1. *ILEX Aquifolium*.

[*Aquifolium*)]—or Common Holly-tree.] Hath

an upright trunk, branching all around, twenty or thirty feet high, in a conic form; oval, waved, stiff, alternate leaves, having the edges and extremity terminated by sharp spines, pointing some upward, and some downward; and from the sides of the branches, small whitish flowers in short clusters, appearing in May; succeeded by bunches of roundish berries, ripening to a beautiful red colour in autumn and winter. Is a native of woods and forests in England.

Of this species are many curious varieties, both with entire green leaves, and with variegated; but the variegated kinds are the most extensive.

Green-leaved Varieties.] Common green-leaved, prickly Holly—smooth green Holly, the leaves being destitute of spines—narrow, serrated-leaved green Holly—green-leaved, yellow-berried Holly—box-leaved green Holly—hedge-hog green holly, having the surface of the leaves closely set with small prickles, in the manner of a hedge-hog: hence it derived the name (*Ilex echinata*.)

Variegated sorts.] Common prickly Holly, with silver-striped leaves—with gold-striped leaves—with blotched leaves—smooth Holly with white-striped leaves—yellow-striped leaves—with blotched leaves—narrow striped-leaved Holly—blotched-leaved, yellow-berried Holly—cream-coloured Holly—copper-coloured Holly—white-leaved Holly—mottled Holly—hedge-hog silver-edged Holly—gold-edged hedge-hog Holly—white blotched hedge-hog Holly—yellow blotched hedge-hog Holly—painted-lady variegated Holly.

All the varieties, both green and variegated kinds, are hardy ever-greens, of the tree and shrub kind, branching out every way from the bottom upward, and are finely adapted for all ornamental plantations; the common green sort also as a forest tree, and for hedges.

2. *ILEX cassine*.

Cassinoide Holly of Carolina, commonly called Dahoon Holly.] Hath an upright branching stem, rising fifteen or twenty feet high; oval-lanceolate, serrated leaves, placed alternate; and small white flowers, in short thick clusters from the sides of the branches; succeeded by red berries, but rarely any in England. Is a native of Carolina.

3. *ILEX vomitoria*.

Yapon, or South-Sea Tea.] Hath an upright branching stem, rising ten or twelve feet high; oblong, serrated, ever-green leaves, placed alternate; and small white flowers in close whorls at the foot-stalks of the leaves, which are succeeded by berries, rarely produced here, it being a native of Florida.

Varieties.]

Varieties.] Broad-leaved Dahoon Holly—narrow-leaved Dahoon Holly.

These species of *Ilex*, together with all the varieties, are of the tree and shrub kind, and ever-green, being closely garnished with leaves all the year; and all the varieties of the *Ilex Aquifolium*, or common Holly, are extremely hardy, as well as very beautiful ever-greens, will prosper in any common soil and exposure; but the Dahoon Holly is rather tender, being subject to injury from severe frost, especially when young; after, however, having occasional shelter two or three years, of a frame, &c. in winter from hard frost, and being gradually hardened, it will bear our ordinary winter very well, in a dry soil and sheltered situation.

All the sorts are fine furniture for every ornamental plantation: nothing can make a finer appearance than a collection of the several varieties of the first species, suffered to take their own natural growth; they being beautiful all the year, but appear rather with greater elegance in winter than summer; and the variegated kinds being interspersed in the shrubbery-clumps, and other ornamental plantations, in assemblage with other hardy ever-greens, their beautiful variegations, with others of different hues, will greatly heighten the contrast; and their numerous clusters of red berries will add considerably to their lustre in the autumn and winter seasons. The Dahoon Holly and Yapon are also very fine plants, and worthy of admittance in every collection of ever-greens.

The first species was also in universal estimation for forming garden-hedges, both for ornament, and as fences, and makes the most beautiful hedge in the world. See HEDGES.

It was likewise greatly used to plant as detached or single objects to train into regular figures, as globes, hemispheres, pyramids, &c.

It is likewise considered as a forest-tree, as its trunk will acquire a considerable bulk, where the trees are suffered to grow up, as in the places of their natural growth, in many of our forests and woods. The wood of it being very white and hard, is valuable for many purposes in the turnery and cabinet-work; for as it takes a fine polish, is very proper for several kinds of household furniture, inlayings, &c. hones for razors are made of this wood, and is fit for many other useful purposes, as a most hard white durable wood.

Of the bark of this tree is made the composition called bird-lime. The bark being peeled about Midsummer, and put into a vessel of spring-water, and boiled about twelve hours, when the white bark will separate from

the green; then lay the green bark on the floor of some cool cellar, covering it with any fresh rank weeds, and when lain a fortnight, pound it in a mortar till it becomes a tough paste; this done, wash it well in several waters till quite clean; put it then into an earthen vessel, to ferment and purge four or five days, scumming off all filth that arises; then change it into a fresh vessel for use; taking any quantity required, adding thereto a third part of well clarified goose or capon grease, mixing them well over a moderate fire, by constant stirring till cold, and the composition is prepared.

The season for transplanting all the sorts of Holly is either autumn, the end of September, any time in October, November, &c. or in the spring. See EVER-GREENS.

Propagation, &c.

The propagation of these trees is by seed, and by grafting and budding.

The common green Holly is raised plentifully from seed in the open ground; and all its varieties by grafting and budding upon stocks of that sort, raised as above from the berries: for so the berries of any of the varieties, and they rarely produce any but plants of the common green kinds; so that there is no other certain method of continuing the variegated sorts, in particular, than grafting or inoculating shoots or buds of them into common Holly stocks. The hedge-hog-Holly berries, however, very commonly produce plants of the same sort, with green leaves; but the variegated kinds thereof are continued by grafting or budding, &c. as observed for the other variegated kinds, &c.

By Seed.—The berries ripen in October and November, when a due quantity is to be gathered from any of the varieties; then observing, that as those seeds generally lie two years before they germinate, they may either be buried in a heap in a hole or pit for a year, to be preparing for vegetation, then taken up and sown; or may be sown at once as soon as gathered, as hereafter directed, and they will come up the spring-twelvemonth following. But as these seeds, like the haws of the hawthorn, &c. never grow till the second spring, as just observed, it is common to bury them a year; that is, in some dry part of the garden, dig a hole or trench a spade deep, or a little more, and one or two wide, or in proportion to the quantity of berries; which directly either deposit in the hole or trench, and cover them over with some of the earth, five or six inches deep; or they may be buried in a large pot or tub, plunged over the top in the ground: in either method let them remain till next October; then having ground dug, and

divided into four-feet-wide beds, with alleys between, trim, with the rake or spade, an inch depth of earth evenly to the top of the bed; this done, take up the berries, and sow them evenly on the bed, beat them down gently into the earth thereof, with the back of the spade, and cover them with the above earth from the alley an inch deep, and smooth the surface: or the berries may be sown in drills the above depth, making the drills six inches asunder: the berries thus sown after being buried in the ground one year, will mostly come up the spring following.

I, however, have observed, that the berries sown at once in the beds, as above, an inch deep, keeping the beds well weeded the following summer, that the berries all lying near the surface an equal depth, will all along enjoy an equal benefit of the air, sun, and showers, so as in the second spring they generally rise rather more regular and strong than those that were buried.

When the plants come up, keep them well hand-weeded; and if very dry weather, some water once a week will be of much service.

Two years let them remain in the seed-bed, then in spring plant them out in nursery-rows, two feet asunder, and a foot distance in each row, there to remain until they are of proper size to be finally transplanted; and the proper season for this is either in autumn, any time from the end of September till that of November, or in the spring.

By Grafting and Budding.—All the varieties are, as above mentioned, continued by grafting or budding; and by either of which modes of propagation they may be multiplied at pleasure, upon stocks of the common Holly, raised from seed, as above directed, which, after being planted out in nursery-rows one or two years, will be of the proper size to graft or bud upon. The grafting is performed in March, by whip-grafting in the usual way; and the budding to be performed in July or August, according also to the usual method. See GRAFTING and INOCULATION.

The Dahoon Holly and Yapon are also raised from seeds like the common kinds. The seeds are imported annually from America, generally in the spring, which, as soon as they arrive, should be either buried in the ground like the common Holly for a year, or may be sown at once in pots of light sandy earth, and plunged to their rims in dry earth about a twelvemonth: then, in spring following, if plunged in a hot-bed, will greatly facilitate their growth, being careful to inure the plants to the full air; afterwards plunge the pots in a shady border till October, then re-

move them under a hot-bed frame for the winter; in spring thin them out, and plant them in separate pots, to have occasional shelter of a frame for two or three winters, then transplanted in spring into the full ground.

IMPATIENS, Touch-me-not, and Balsamine, or Balsam.

This genus furnishes beautiful flowery annuals, of upright growth, branching a foot and a half, or two feet high; adorned with oval and spear-shaped leaves; and quinque-petalous irregular flowers.

Class and order, *Syngenesia Monogamia*.

Characters.] CALYX is two-leaved, coloured, and placed on the side of the corolla. COROLLA is ringent, of five roundish, unequal petals, and a one-leaved, hood-shaped nectarium at bottom, terminating at the base in a spur or tail. STAMINA, five short incurved filaments, having the tops of the antheræ joined. PISTILLUM, an oval germen, no style, but a short simple stigma. PERICARPIUM, an unilocular capsule, opening with elasticity in five twisted, spiral valves, and roundish seeds, fixed to the columnar receptacle.

This genus derives the name *Impatiens* from the elastic property of its seed-vessel, which, when ripe, is so impatient of the touch, as to burst open with elasticity, and dart its seeds from their department with great velocity, especially the first species. There are only two species of this genus usually cultivated in the English gardens, both annuals: one is the *Noli me tangere*, or Touch-me-not, esteemed more for the singularity of its elastic capsules than beauty of its flowers: the other is that noted annual, Balsamine, or Balsam, comprehending several elegant varieties, producing numerous fine large flowers of singular beauty.

The principal species are,

1. IMPATIENS, *Noli me tangere*.

Touch-me-not, or Yellow Balsamine.] Hath fibry roots; an upright, jointed, succulent stalk, a foot and a half high; oval, alternate leaves; and from the axillas of the stalks, long, slender, branching foot-stalks, each sustaining many yellow flowers; succeeded by taper capsules, which burst open, and dart out their seeds with elastic force.

It grows wild in England, but is cultivated in many gardens for curiosity.

2. IMPATIENS *balsamina*.

Balsamine, commonly called Balsam.] Hath a fibry root; an upright, thick, succulent stalk, branching all around, a foot and a half to two or three feet high; long, spear-shaped, sawed leaves, the upper ones alternate; and, from the joints of the stalk and branches, clusters of short

short foot-stalks, each sustaining one large irregular flower, of different colours in the varieties; flowering from June or July till September.

Varieties of this are,] Balsamine with single and double red flowers—single and double scarlet flowers—single and double white flowers—single and double purple flowers—variegated single and double flowers—large, double, variegated, scarlet and white flowers—large, double, variegated, purple and white flowers—double red and purple—large double bizarre, &c. all of which are most beautiful annuals, but being originally of Indian growth, are somewhat tender, requiring mostly to be raised and forwarded in hot-beds, &c.

Both the species and respective varieties are proper to be employed as plants of ornament to adorn the pleasure-garden; but the second sort, *Balsamina*, and varieties, are considerably the most beautiful, excelling also most others of the annual tribe. The flowers of both the species are moderately large, and consist each of five roundish, unequal petals, and a monopetalous, hood-shaped nectarium, ending in a tail; the whole corolla is irregular, and somewhat resembling the ringent, or grinning flowers (see *COROLLA Ringens*); and are succeeded by plenty of seed in autumn, by which all the sorts are raised annually; the first sort in the common ground in autumn or spring; and the second chiefly in hot-beds in March and April. See their *Propagation*, &c.

The first species, *Impatiens noli me tangere*, being an indigenous plant of England, is very hardy; and is worth cultivation in gardens, both for the variety of its flowers, and the curiosity of its elastic seed-vessels, &c. will grow freely in the open borders, by seed in autumn or spring, sown either where the plants are to remain, or for transplantation.

The *Impatiens Balsamina*, or Balsamine, is one of the finest annual flowers of our gardens; but being a native of India, is tender, not able to bear the open air here before May or June, and requires to be raised principally in a hot-bed in spring, under frames, &c. until June, as aforesaid; remarking, however, that the seeds will also grow in the natural ground in May, if a warm, dry season, rarely before, and more freely then, if covered with a hand-glass, &c. but the plants so raised will not begin to flower so soon by five or six weeks, as those forwarded by artificial heat, under frames and glasses. All the varieties are of somewhat luxuriant growth, they frequently having stems thicker than good walking-canes, branching out into large heads, and every branch productive of abundance of flow-

ers; and as the branches advance in length, furnish a succession of bloom for two or three months; observing that the variegated doubles have the greatest merit, which are sometimes as large as middling roses, and the petals multiplied in many series; and all the varieties produce seed plentifully in autumn.

The fine varieties of this elegant species, are commonly planted in pots to decorate fore-courts, and other conspicuous compartments; and the more inferior varieties are generally disposed in the common borders, as all the varieties, after being raised as above hinted, until June, will grow freely in the open ground, the remainder of the summer.

Propagation and Culture, &c.

The propagation of both the species, and the varieties in general, is by seed; remarking, that the plants being but of one summer's duration, the sowings must be performed annually.

The *Noli me tangere* may be sown in autumn, i. e. September, October, or November, or early in spring, February or March; in any bed or border, half an inch deep, either in patches where the plants are to remain, or for transplantation; and when the plants are come up an inch or two high, thin them to three in each patch; observing the same if they are to be transplanted. From the scattered or self-sown seeds of this species in autumn, many young plants will rise naturally the following spring.

The *Balsamine* is always sown in the spring, in March or April, and should be performed principally in a hot-bed, as before observed, and the plants continued therein till June; and if under deep frames, may be drawn up two or three feet high by the latter end of that month.

Particular attention is requisite to procure seeds of the fine variegated doubles, especially if intended to exhibit a grand show of them in pots, or principal borders and flower-beds. Sow the seed either in pots of light, dry, rich earth, half an inch deep, plunging the pots in a hot-bed; or it may be sown immediately in the earth of the hot-bed in small drills the above depth: the plants will soon appear, which are to be managed as other annuals of similar temperature, with respect to giving air daily, and frequent moderate waterings. When they are two or three inches high, it is proper to prick them out, either in the same or in a fresh hot-bed, under a proper frame; raising them up with the roots entire, and either plant some of the best in pots (thirty-twos), one plant in each, up to their seed leaves, and plunge the pots in the hot-bed, as observed

observed for the seed, or plant them into the earth of the bed, four or five inches asunder: in either method give a moderate watering directly, and occasional shade from the mid-day sun till they are fresh rooted; repeating the watering frequently. After having grown here about a month, they will be so much advanced in growth as to interfere with each other, when those in pots may be turned out with the earth about their roots into larger pots (twenty-fours), to remain; which, if plunged also in the hot-bed, will greatly forward the growth of the plants. Those planted in the earth of the hot-bed, if any of them are designed for pots, should also be then taken up with balls of earth, and potted, and treated as above, giving water and occasional shade as before. As they all advance in growth, raise the frame, if necessary, that they may grow to their full height; for it is a principal property to have these plants of some considerable stature. See ANNUAL PLANTS.

They must remain constantly in the frame till June, then harden them gradually to the full air, so as they may be removed into it fully towards the middle or latter end of that month, according to their size, and temperature of the season; at which time also those designed for the borders should be transplanted therein with balls of earth about their roots, giving water at planting, repeating it daily, or as there shall seem occasion, till they have taken good root.

As soon as they are removed into the open air, both those in pots and in the full ground should have a tall stick placed to each for support, to which tie their stems neatly.

Let those in pots be often watered in dry weather; once or twice a day in very hot weather will be necessary.

All the varieties of Balsamine may be raised to great perfection in a stove, with little trouble; sowing the seeds in pots, and plunge them in the bark-bed, and when the plants are two inches high, plant them in separate pots, which plunge also into the bark-bed to remain until the plants are grown up.

But in default of hot-beds, &c. these plants may also be sometimes raised in the common ground for an autumnal bloom: the seeds will not, however, succeed in the natural earth before May, and even then must be sown in a warm dry border, or in pots placed in a warm situation, and if covered with hand glasses occasionally, will be an advantage, though they will often come up without any shelter at all, and flower abundantly in August and September, or until killed by the cold.

I would, however, observe, that sowing

these seeds in the natural earth is not always to be depended on; and that the plants raised and forwarded in a hot-bed arrive not only much sooner to perfection, so as to have the pleasure of their bloom six weeks sooner; but by being thus forwarded into bloom betimes in summer, they always produce the best seeds.

To save seeds of the fine variegated doubles, some pots of them should be placed, when in full bloom, either in an airy glass-case, having the windows in front to open, or in some deep frame to be sheltered with the glasses occasionally from great autumnal rains, and cold nights; you will thereby have a much greater chance of having plenty of seed perfectly ripened.

INARCHING. See GRAFTING.

INDIGOFERA, *Indigo*. A genus of Indian and African shrubby exotics, with sub-pinnate leaves, and leguminous butterfly flowers.

Class and order, *Diadelphia Decandria*.

Characters.] A spreading, five-toothed, one-leaved cup. COROLLA, papilionaceous. VEXILLUM, emarginated, reflexed, spreading, and round; wings obtuse, oblong, with their lower margin spreading. CARINA, with an awl-spreading spur at each end. STAMINA, diadelphous, collected in a cylinder, and topped with roundish antheræ. PISTILLUM, a cylindric germen, short style, crowned with a blunt stigma. PERICARPIUM, a long, linear pod, containing kidney-shaped seeds.

There are several species of this genus, the most material of which are the following stove and green-house kinds:

1. INDIGOFERA *tinctoria*.

Dyer's Indigo.] Indigo with a shrubby stalk, short branches, oval winged leaves, and arched pods.

2. INDIGOFERA *argentea*.

Silvery-leaved Indigo.] Indigo with a shrubby stalk, and oval, woolly, winged leaves.

3. INDIGOFERA *amæna*.

Scarlet-flowered Indigo.] Indigo with a shrubby stalk, roundish branches, pilous, oval, ternate leaves, and pedunculated spikes.

4. INDIGOFERA *candicans*.

White Indigo.] Indigo with ternate spear-shaped linear leaves, underneath white, with pedunculated spikes of red flowers, and straight cylindric pods.

The two first sorts are ornamental for the stove, and the others for the greenhouse; their propagation is by seeds, sown on a hot-bed, though some may be increased by cuttings, with the assistance of a bark-bed, in summer.

INFLO-

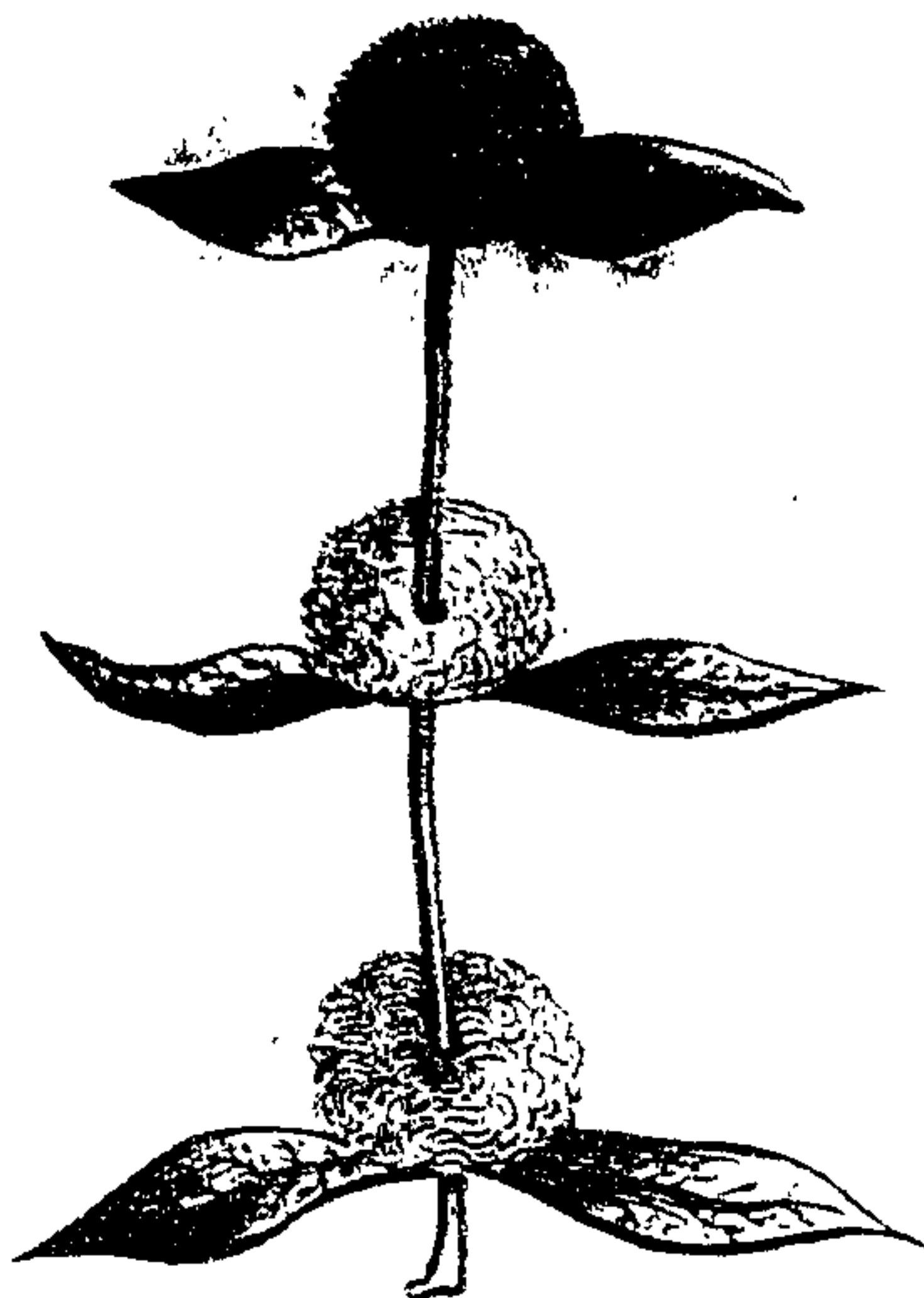
MODES OF INFLORESCENCE.

Facing Inflorescence

Monopetalous



Tortuillus



Panicle



Spike

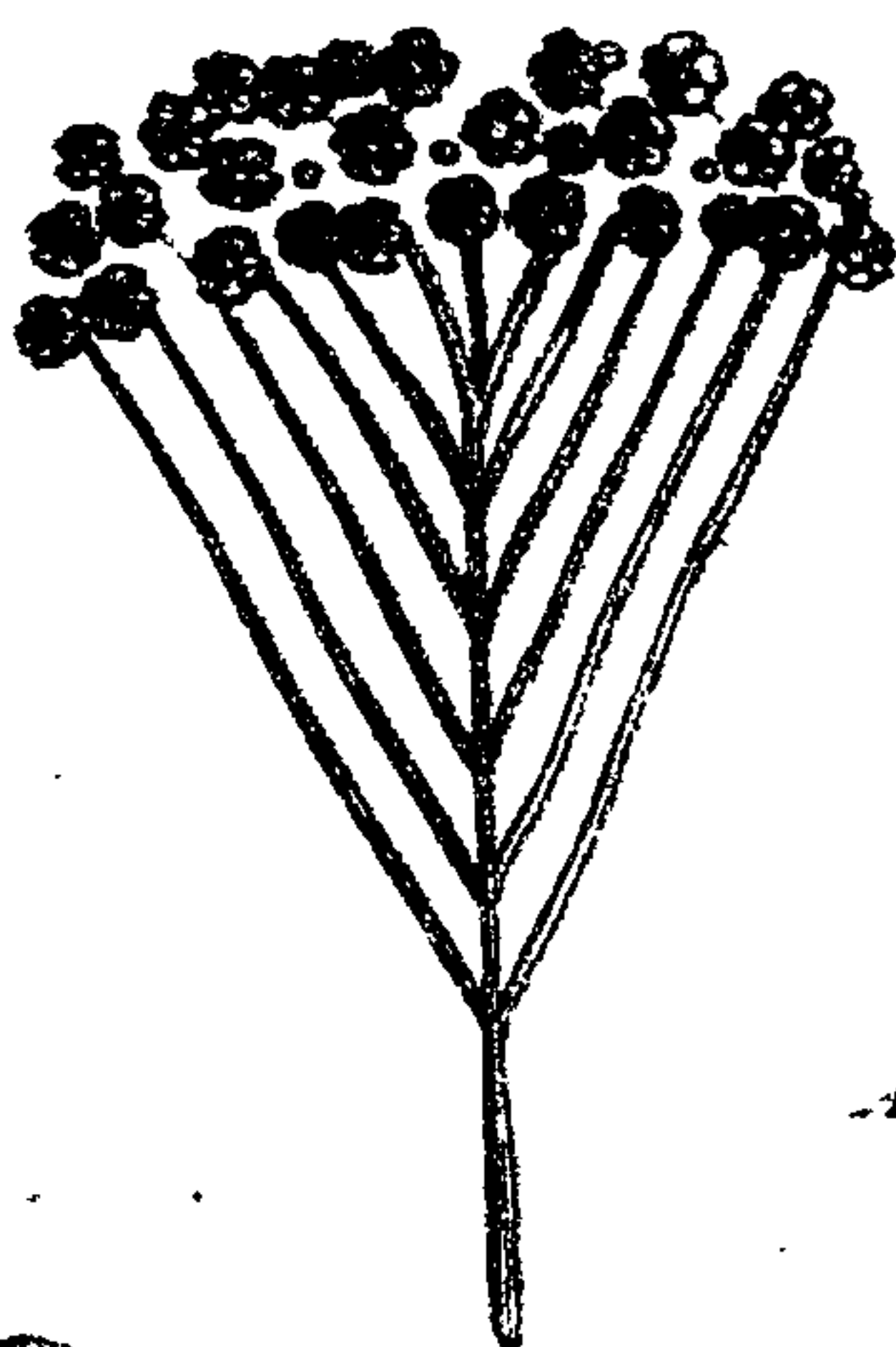


Bractea

Tubulose floret



Corymbus



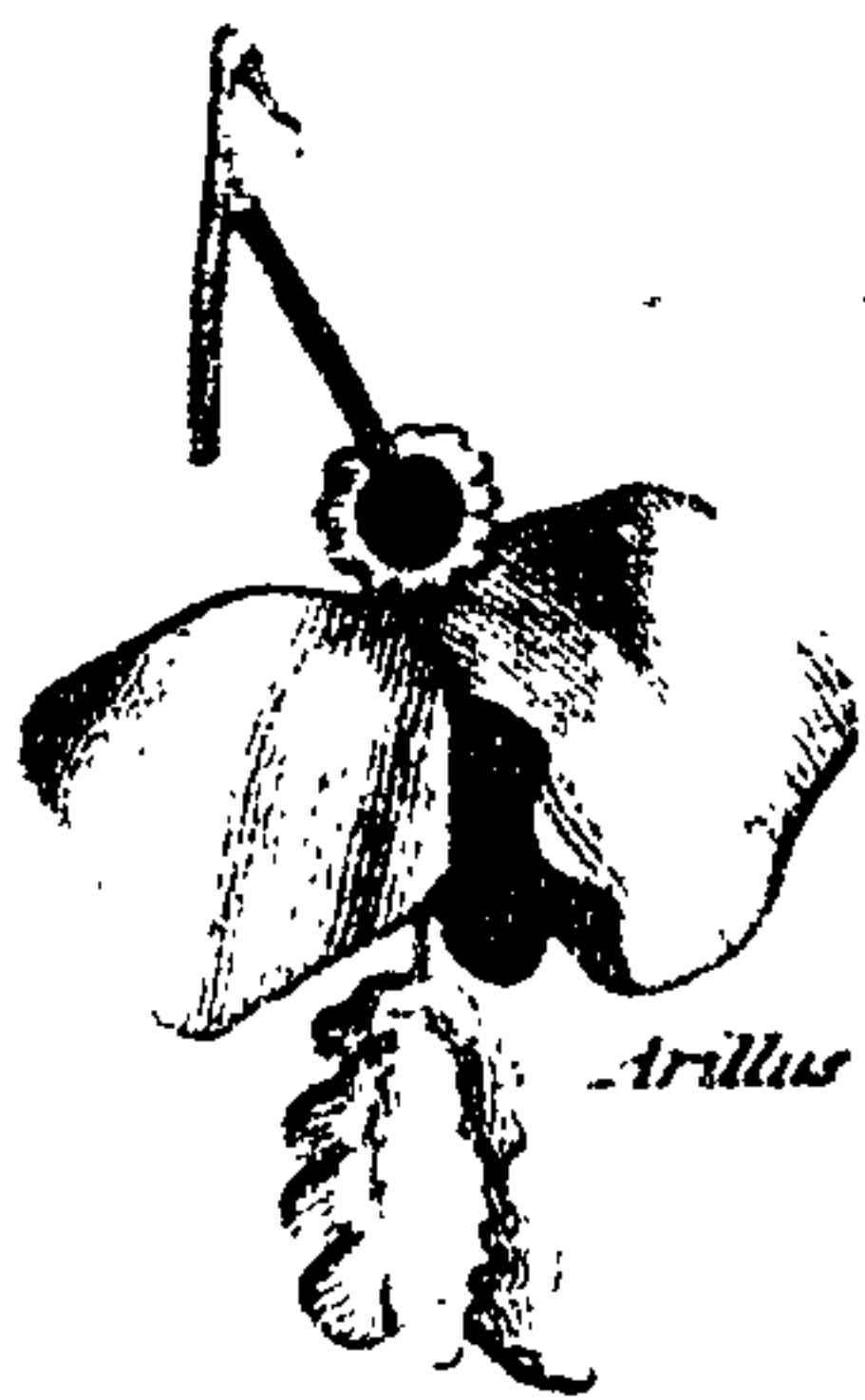
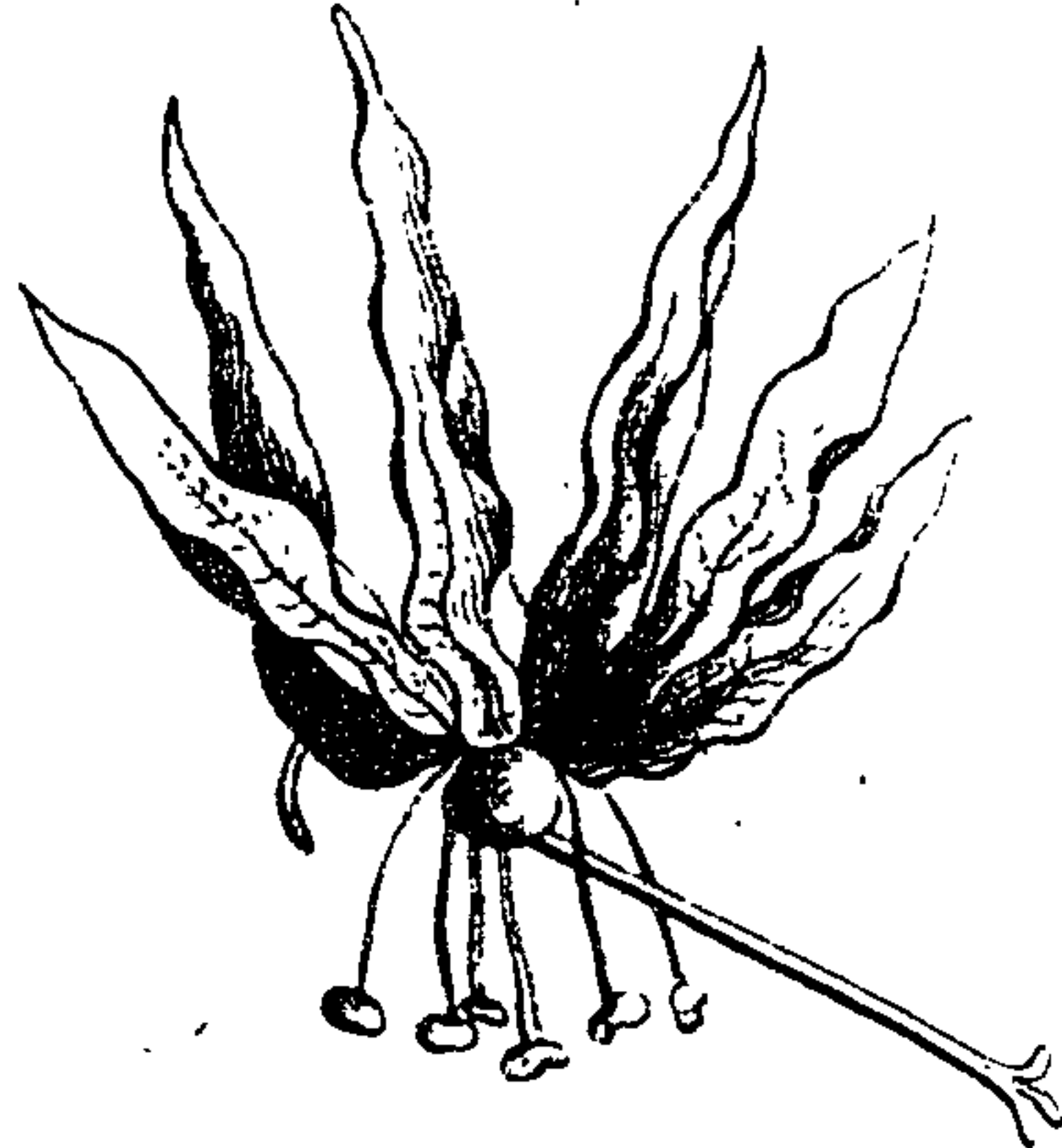
Quia



Thyrus



Polypetalous



Arillus

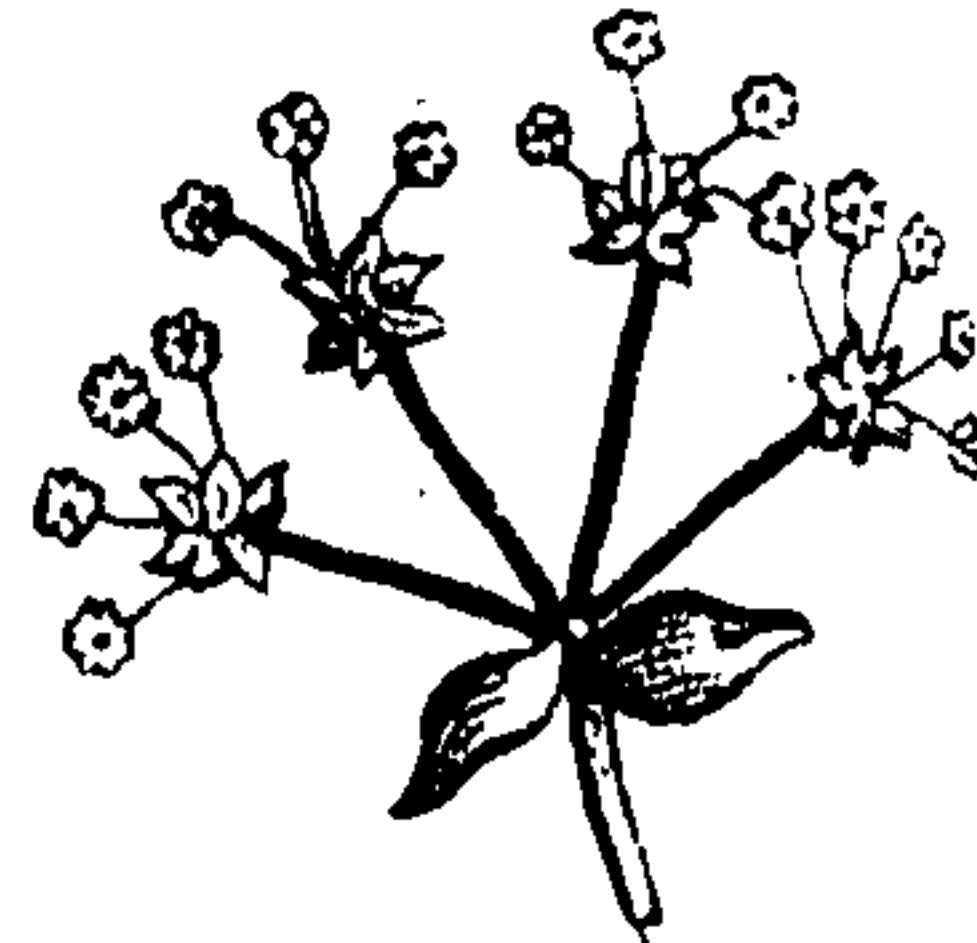
Amentum



Gume



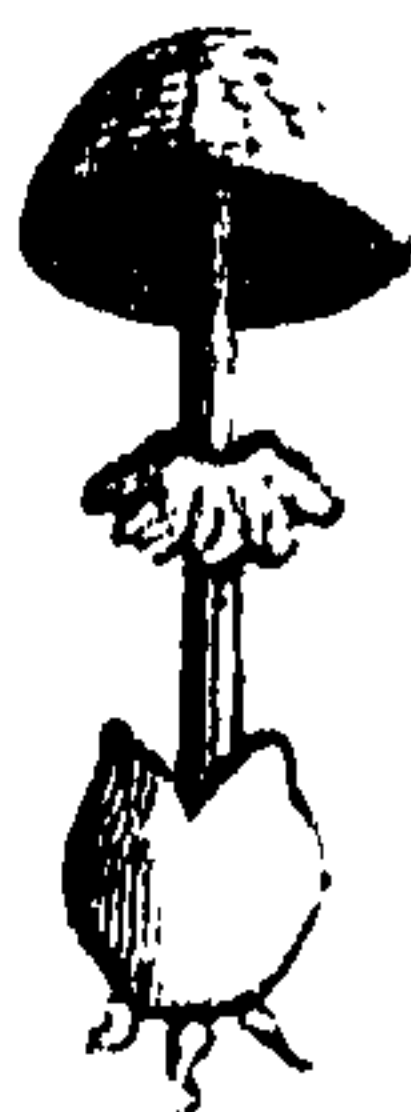
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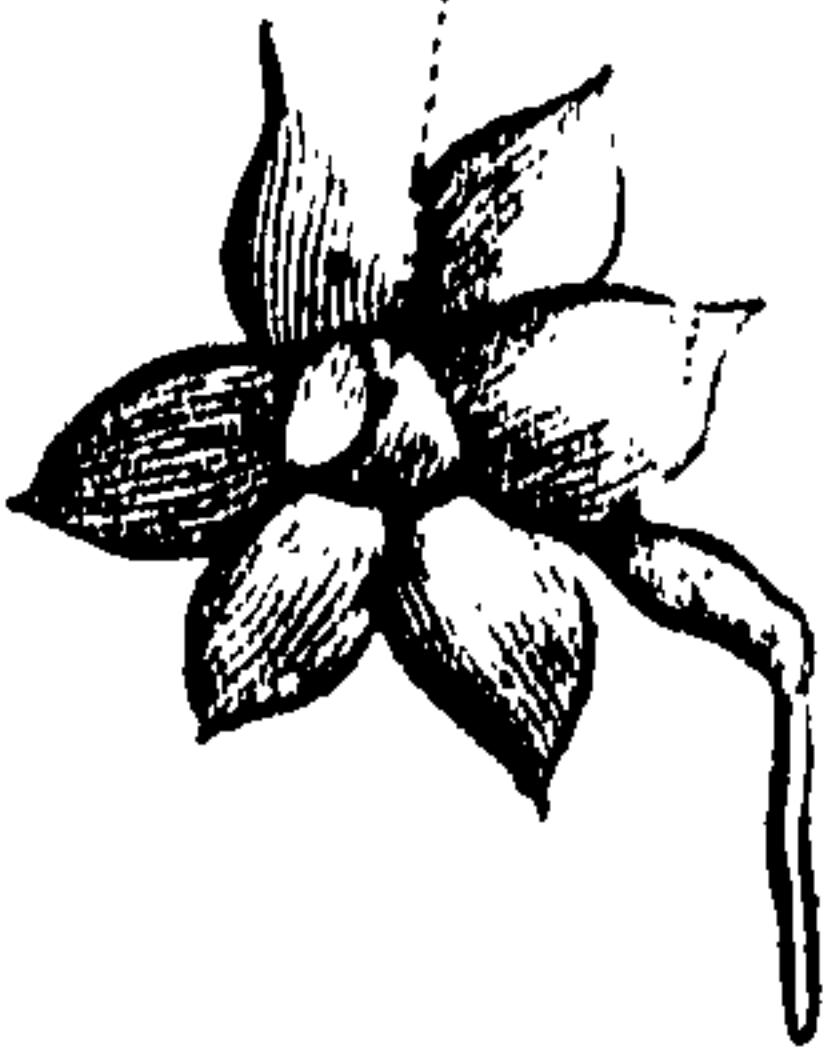
Hypocrateriform



Fungus



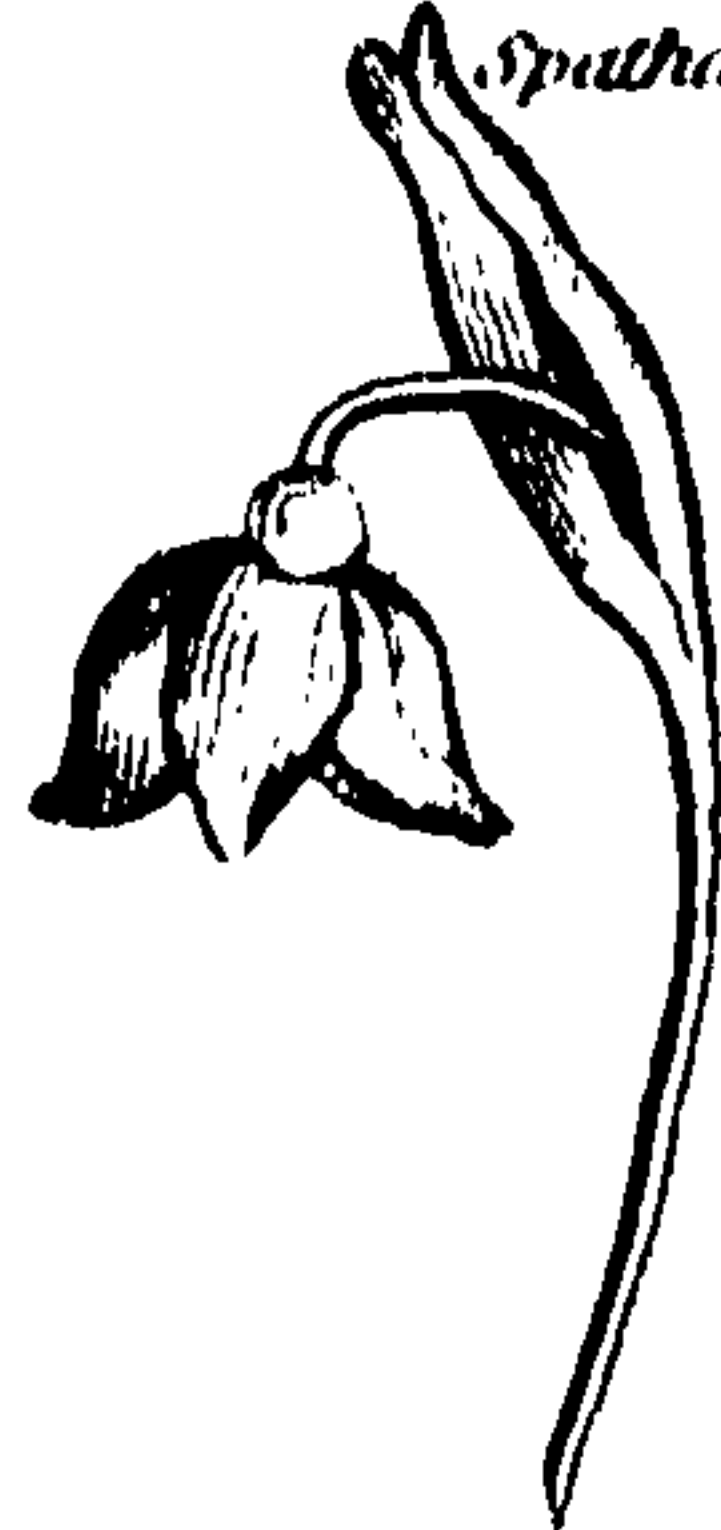
Nectarium



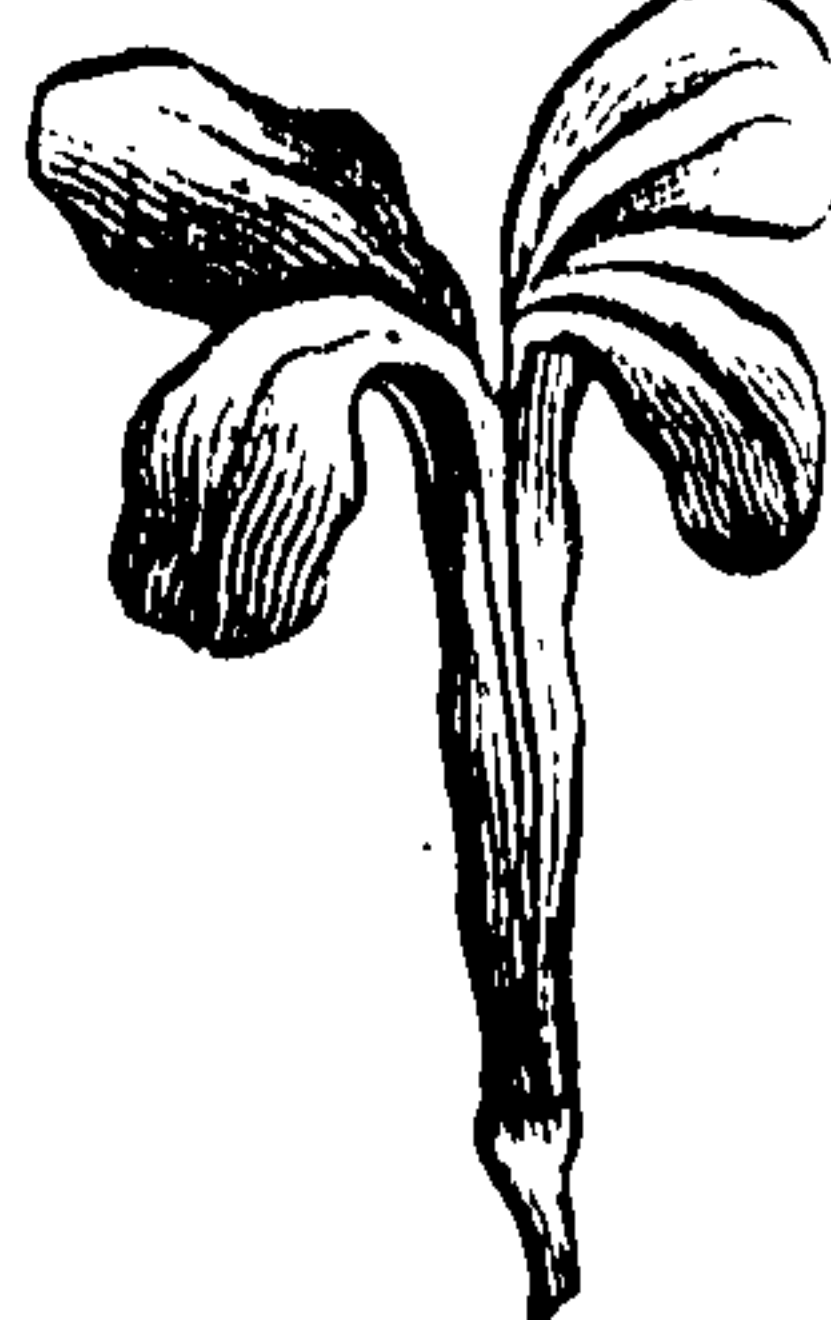
Spatha & Spadic



Spathaceous



Polypetalous



INFLORESCENTIA, *Inflorescences*, or manner of flowering of all kinds of plants.

The term, Inflorescence, signifies the mode or manner in which flowers are produced upon the plants, which is various; though, in all the known plants and trees in the world, there are but eight or nine different modes of flowering, which are expressed by the following terms.

Capitulum, Corymbus, Panicle, Racemus, Spica, Thyrsus, Verticillus, Umbella, and Cyma; for an explanation of each of which, see each under its proper head.

INOCULATION, or Budding, a method of propagation, practised occasionally for various trees, but more particularly the fruit-tree kind.

The work of Inoculation, or budding, is the inserting an eye or bud of one tree into the side of another; and the bud uniting therewith, shoots out into branches, becomes a tree, producing flowers and fruit the same in all respects as those of the tree from whence it was taken; thus any sort of tree may be multiplied at pleasure, since every bud will form a tree exactly of the same sort, though upon a different stock and root; as for example, insert buds of peach, nectarine, and apricot trees into plum-stocks, which being headed the spring after, the inserted bud then shoots and becomes the tree; and though the root and bottom of the stem be a plum-tree, the upper branchy part being produced from the bud, is a peach or nectarine, &c. and produces fruit exactly the same as that from which you took the buds. It is therefore, as observed of grafting, &c. the only method by which we can with certainty continue and multiply the different approved varieties of many kinds of fruit and other trees; for although their seeds will readily grow and become trees, yet, as we formerly observed, sow the seed, or kernels of the finest varieties of fruit, not one tree out of a hundred, so raised, will produce any like the original, and but very few that are good; so variable are seedling fruit-trees, and many others; but the trees or stocks, so raised, being budded with the proper approved sorts, the buds produce invariably the same kind of tree, fruit, flowers, &c. continuing unalterably the same.

The work of budding is performed in summer, principally in July and August, by inserting buds into the sides of the stocks, leaving their heads entire, and the buds remaining dormant till next spring, when the stock being headed, they shoot forth with vigour.

This mode of propagation is particularly useful for peaches, nectarines, and apricots,

which succeed better by budding than grafting, and are usually worked upon plum-stocks raised from seed, and sometimes by suckers, layers, and cuttings, upon particular occasions, as noticed in their respective articles. Peaches, nectarines, and apricots, are also often budded upon their own stocks, i. e. stocks raised from the kernels of these kinds of fruit; they, however, are commonly more strong and durable upon plum stocks.

Plums and cherries are also very often propagated by Inoculation as well as by grafting; the cherry, however, is generally the most prosperous by the latter method, as being more apt to gum and go off by budding. Both these sorts being of the same genus, will grow upon stocks of each other, but much the best upon their own stocks, that is, plum upon plum, and cherry upon cherry stocks.

Apples and pears may likewise be propagated by Inoculation as well as by grafting, though, as they grow freely by grafting, which being the most easy and expeditious, they are commonly propagated by that method.

In short most kinds of fruit-trees, and others, that are propagated by grafting, will also succeed by Inoculation; grafting, however, is more particularly adapted for some sorts, and budding for others, as is always explained under their respective articles.

Many sorts of forest-trees, and flowering-trees, &c. both deciduous and ever-greens, may also be propagated by Inoculation, which is a certain method of propagation, to continue particular varieties, such as many of the variegated-leaved kinds, as the variegated hollies, &c. and many other sorts; which is always mentioned in their propagation and culture, under their proper genera.

The Inoculation for all sorts is commonly performed upon young trees, raised from seed, suckers, layers, &c. which, when raised purposely for budding and grafting upon, are called stocks, and which, when about half an inch thick in the bottom of the stem, or a little more or less, are of a proper size for budding; though it may be performed upon stocks from the size of a goose-quill, to an inch or more big: remarking that all Inoculation must be performed principally upon stocks or trees of the same genus, for it is but few trees that will succeed upon stocks of different genera. Peaches, however, and nectarines, being of the genus *Amygdalus*, grow freely upon the *prunus*, or plum-tree, as being very nearly related, and is the most common stock on which these sorts are usually budded. But in most other kinds of fruit-trees, and others, the stocks of the same genus or

fraternity must be strictly adhered to, both for budding and grafting. See GENUS.

For instance, peaches, nectarines, and almonds, may be inoculated either upon their own, or plum-stocks, but principally upon the latter to have durable trees. Apricots being of the genus *Prunus*, must be budded chiefly on plum-stocks, or else upon their own; cherries upon cherry-stocks; apples upon apples; pears upon pears, or upon quince-stocks, to have dwarfs. Observing also the same of all other kinds of trees and shrubs, that are propagated by Inoculating and grafting.

The stocks are very commonly raised from seed, i. e. the kernels or stones of the above sorts of fruit, &c. sown in autumn or spring, in beds in the nursery, an inch or two deep; they will come up in April or May following, which when a year or two old, transplant them in nursery-rows, two feet asunder, and fifteen or eighteen inches distant in the rows; here to stand for budding, keeping them to one stem, and suffer their top to run up entire; and having two or three years' growth, when about the size of your little finger at bottom, or a little more or less, they are of due size for budding; stocks are also often raised from suckers arising from the roots of the trees of their respective sorts; likewise by layers and cuttings. See STOCKS.

Note, Budding may also be performed occasionally upon trees that already bear fruit, when intended to change the sorts, or have different sorts on the same tree, or to renew any particular branches of a tree, performing the operation in the young shoots of the year, or of one or two years' growth.

Of performing the Operation.

The inoculation is always performed in summer, when the shoots of the year are advanced to proper growth to furnish good buds, and when the rind of the stock, and that of the cuttings for the buds, will readily separate from the wood; for the bud, being cut off from the shoots an inch or more long, the woody part adhering thereto is stripped off, are then inserted into the side of the stock, between the rind and wood thereof, the head remaining entire at present; and is done by splitting the bark of the stock cross ways, and perpendicularly, as directed below; and the rind and wood being then divided, the bud is inserted between them; which remaining dormant till spring following, when the stock are headed down to the place of insertion the bud shoots forth, and forms the new tree, which in some sorts will bear fruit in two or three years.

The proper season for performing the operation of budding is from about the middle of

July until the middle or latter end of August: some however begin to bud in June; but the buds inserted so early, are apt many of them to shoot the same year; and the shoots not having time to harden, are very liable to be killed in winter; determine therefore upon the end of July; or first fortnight in August, to perform the operation, and your buds will all remain dormant till spring when they will shoot with vigour.

The buds are to be taken only from the young shoots of the year, i. e. shoots of the same summer's growth, which must be cut from the trees of the sorts you intend to propagate. Chuse them from healthful thriving trees; and if fruit-trees, from such that bear the finest fruit of their respective kinds and varieties: from which cut a quantity of the best moderately strong young shoots, each day as they are wanted; and as they are gathered, cut off all the leaves, not quite close, reserving about a quarter of an inch of their foot-stalks, trimming off also the soft unripened top-end of each cutting; then cover them from the sun and air, and take them out as you want them; observing as each cutting furnishes many buds, they are to be cut off about an inch and a half long, one at a time, as they are inserted in the stock; remarking that those in the middle-part of the cutting are preferable to those towards each end, though in cases of scarcity of cuttings, every one of them may be used; one bud only is commonly inserted in each stock; some, however, place two, one on each side opposite.

The proper height to bud the stocks is various, and may be within from about three or four inches of the ground, to six feet or more; that is, to have dwarf-trees for walls and espaliers, &c. they must be budded from within about three to six inches of the bottom, that they may first furnish branches near the ground. If for half-standards, bud at the height of three or four feet; and if for full standards, at from about five to six or seven feet height; so that you must train your stocks accordingly, some for dwarfs, some for half standards, and others for full standards, as is more fully particularised under the several articles. I would remark, however, that for half and full standards, the budding may, if you please, be performed as low in the stock as for dwarfs, and the first shoot from the bud trained up to a proper height for a stem.

The proper implements and materials for budding are, a small budding-knife, for preparing the stock and buds for insertion, having a flat

a flat thin haft, to open the bark of the stock, to admit the buds, and a quantity of new bass strings to tie them.

To proceed to the operation.—Observe in the operation of budding, the head of the stock is not to be cut off, as in grafting, but the bud is inserted into the side, and the head to remain entire till spring after, and then cut down; therefore fix on a smooth part on the side of the stock, at the proper height, rather on the northward side, away from the sun, and with your budding-knife make a horizontal cut across the rind of the stock, quite through to the firm wood, then, from the middle of this transverse-cut, make a slit downward perpendicularly an inch or more long, going also quite through to the wood. This done, proceed with all expedition to take off a bud; holding the cutting in one hand with the thickest end outward, and with the knife in the other hand, enter it about half an inch, or more, below a bud, cutting near half way into the wood of the shoot, continuing it with one clean slanting cut, about half an inch or more above the bud, so deep as to take off part of the wood along with it, the whole about an inch and a half long; then directly with the thumb and finger, or point of the knife, slip off the woody part remaining to the bud; which done, observe whether the eye or gem of the bud remains perfect; if not, and a little hole appears in that part, it is improper, and another must be prepared; this done, placing the back part of the bud between your lips, expeditiously with the back of the knife, or rather the flat haft thereof, separate the bark of the stock on each side of the perpendicular cut, clear to the wood for the admission of the bud, which directly slip down close between the wood and bark to the bottom of the slit; and then cutting off, if necessary, the top-part of the bud even with the horizontal cut, to let it completely into its proper socket; let the parts then be immediately bound round with a ligature of fresh bass, previously soaked in water to render it pliable and tough, beginning a little below the bottom of the perpendicular slit, proceeding upward closely round every part, except just over the eye of the bud, and continue it a little above the horizontal cut, not too strait, but just sufficient to keep the whole close, exclude the air, sun, and wet, and promote the junction of the stock and bud. In this manner proceed with the Inoculation of every stock till the whole is finished. The junction of the stocks and buds will be effected in three weeks; and next spring, the head of the stock being cut off, the buds will push

out, each producing one shoot, sometimes a yard or more long by the end of summer.

This operation of budding may, to those unacquainted, appear a tedious work; but an expert hand in the nurseries, will bud a great number in a day.

In a fortnight at farthest after budding, you will be able to judge which buds have taken, by their fresh appearance at the eye.

Three weeks, or thereabouts, after the operation, all those buds that have succeeded will be firmly united with the stock, and the parts be swelled, and require the bandage to be loosened: let, therefore, the tyings be then either properly loosened or taken wholly away, that the buds may have full liberty of growth, in common with the other parts of the stock; which is all that is necessary to be further done until spring, when the stocks must be headed down to the bud.

In spring, about February or March, just before the trees begin to shoot, cut off the head of the stock sloping, exactly above the bud, not three or four inches higher, as is sometimes done; after this, the whole effort of the stocks being directed to the inserted buds, they will soon push forth strong, one shoot from each; many shoots will also arise from the stock; but these must be constantly rubbed off as often as they appear, that all the powers of the stock be collected for the vigour of the bud-shoot, which now commences the tree, and by the end of summer will, in some sorts, be advanced three or four feet high; and in the autumn or spring following, the young trees may be transplanted into the places where they are to remain, or may remain longer in the nursery, as shall be convenient, according to the purposes for which they are designed.

Observe, however, that wheresoever the trees are, if fruit trees, and designed for walls, espaliers, or dwarfs, the first shoot from the bud should, in the spring after it is produced, be headed down to four or five eyes, to force out first some lower shoots near the bottom, as directed for dwarf-trees, wall-trees, espaliers, &c. but if designed for half or full standards, and if they were budded at proper height at first in tall stocks, and designed for detached standards in the open ground, the first shoot of the bud may either be shortened, as above, to four or five eyes, to provide lateral branches near the top of the stem, to form a spreading head; or may be suffered to grow up in height, and branch out in its natural way, whereby it will form a more erect head of loftier growth; remarking, however, that such full or half standards as are designed for walls,

walls, and were budded high on the stocks, must necessarily have the first shoots headed down in the spring following, to force out lateral shoots to furnish the allotted space of walling; observing again on the other hand, that, where trees are designed for any sort of standards, and budded low in the stock, the first shoot of the bud must be trained up for a stem to a proper height before it is stopped; and when arrived to its proper stature, should be topped to throw out shoots to form a head at the desired height, either for walls or open-ground standards. See DWARF-TREES, ESPALIERS, WALL-TREES, and STANDARD-TREES, &c.

For the further management of budded trees, see the different articles under their proper genera; where the general culture of each sort, both dwarfs and standards, is fully exhibited.

INVOLUCRUM, a kind of general calyx to umbelliferous flowers.

This kind of calyx is placed below the common receptacle of the general flower, which consists of a number of small flowers together, elevated on many foot-stalks, all proceeding from the same point or centre, and rise to the same height; and each foot-stalk terminates in a smaller umbel, similar in form to the larger or main umbel, and generally furnished, like it, with an Involucrum.

And, in umbelliferous flowers, they, besides the two general cups, or Involucrum, above mentioned, have mostly a proper calyx, or flower-cup, to each of the florets, or small flowers, which together, compose the umbel; so that the Involucrum is separate and distant from the florets in their advanced state, though at first it forms a sort of general cover to the whole.

This Involucrum consists of one, two, or three, to five, seven, or many leaves, in different genera; and often disposed round the receptacle in a sort of radius; though some umbelliferous flowers are destitute of an Involucrum, both in the general and partial umbel.

IPOMŒA (formerly *Quamoclit*), *Scarlet Convolvulus*.

The plants are herbaceous, twining climbers, natives of the Indies, consisting of tender annuals and perennials of the flowery kind, rising with twining stalks upon support six or eight feet high, adorned with simple, cordated leaves and monopetalous flowers.

Class and order, *Pentandria Monogynia*.

Characters.] CALYX is small, five-parted, and permanent. COROLLA is monopetalous and funnel-shaped, the tube very long and

nearly cylindric, and the limb five-parted and spreading at top. STAMINA, five long filaments, and roundish antheræ. PISTILLUM, a roundish long style, and headed stigma. PERICARPIUM, a roundish trilocular capsule, and three seeds.

There are several species, but not more than two common to the English gardens, which are climbing flowery annuals very nearly allied to the *Convolvulus*.

1. IPOMŒA *coccinea*.

Scarlet Ipomœa, commonly called Scarlet Convolvulus.] Ipomœa, with long, slender, twining stalks, rising upon support six or seven feet high; heart-formed, pointed leaves, angulated at the base; and from the sides of the stalks and branches, many slender foot-stalks, each supporting several large funnel-shaped, beautiful scarlet flowers.

Variety.] Orange-coloured flowers.

2. IPOMŒA *Quamoclit*.

Winged-leaved Ipomœa.] Ipomœa with long slender twining stalks, rising on support five or six feet high, winged leaves, with linear folioles, many long slender foot-stalks, each supporting one, seldom two flowers, of a deep scarlet colour.

Both the species are annual, rise from seed in spring, flower in July and August, &c. ripen seeds in September and October, and wholly perish soon after.

They are both of the tender annual tribe, require to be raised and forwarded in a hot-bed till June, then, the first sort in particular may be planted out to adorn the borders, and some planted in pots to place occasionally to ornament any place as may be required; and in both of which, they must have tall sticks placed to support them in their twining, climbing growth; but the second being rather more tender, some pots thereof should be placed in the stove.

The propagation of both the species is by seed, sown annually in the spring.

The first sort should be sown in March or April, in a hot-bed, along with other annuals of similar quality; may be sown in small drills, half an inch deep; and in May or June, plant them out into the open ground; or, if when the plants are come up an inch or two high, they are taken up and pricked down upon the same or rather in a new hot-bed, it will forward and prepare them better for final transplantation; or the seed may be sown in small pots, three or four seeds in each, and the plants may be turned out, with the earth about their roots, where they are designed to flower: observing, during their residence in the hot-bed, to admit air, and give refreshment of water,

as directed for annuals of the same temperature. See ANNUAL PLANTS.

The second sort must also be sown early in the spring, two or three seeds in a small pot on a hot-bed; and when the plants are advanced to a climbing state, should be shifted with the earth entire, into a larger pot, in which should be placed two or three sticks four or five feet long, for the plants to twine upon, and removed into the stove, there to remain to flower, and produce their seeds, as otherwise they will not ripen.

IRIS, *Flower-de-luce*, or Flag-flower, &c.

This genus is very comprehensive in a numerous family of herbaceous, flowering perennials, both of the fibrous, tuberous, and bulbous-rooted kind, producing thick annual stalks, from three or four inches to a yard high, terminated by large hexapetalous flowers, having three of the petals reflexed quite back, and three erect, most of which are very ornamental garden flowers.

Class and order, *Hexandria Monogynia*.

Characters.] CALYX, a permanent spatha. COROLLA, six oblong obtuse petals; the three outer are reflexed back, the interior ones erect, and all of them united at the base. STAMINA, three subulate filaments lying on the reflexed petals, and oblong, depressed antheræ. PISTILLUM, an oblong germen under the corolla, short style, and large stigma divided into three broad segments. PERICARPIUM, an oblong, angular, trilocular capsule, and many large seeds.

To this genus is now added, the *Hermodylus*, or Snake's-head Iris—*Xiphium*, or Bulbous Iris—and a species of *Sisyrinchium*; their generic characters determining them to be all species of this genus. Each of these, however, is exhibited under a separate head.

The flowers of all the species of this genus have great singularity in their structure; they are large, consisting each of six petals, the three interior ones standing erect, called standards, and the outer ones reflexed backward, called falls, which in some species are bearded, having a downy matter running along the middle; other species are unbearded, having the bent petals smooth, and in the centre a sort of three-lobed nectarium, like three smaller petals, one generally inclining towards each fall.

So that they may be divided into two classes, the bearded, and unbearded kinds.

Bearded Kinds.

These are mostly of the sword-leaved kind; have thick, knotty, fleshy, perennial roots; sending up annually clusters of long, flat, ensiform, erect leaves, from three inches to two feet in length; and amidst them upright thick

flower-stalks of various statures in different sorts; ornamented in most species with leaves the same as the radical ones; and terminated by the flowers, in some but one, others two, three, or more, one above another, appearing mostly in May, June, and July; succeeded in several of them by plenty of seed.

1. IRIS *pumila*.

Dwarf Austrian Iris.] Hath a large, fleshy, knotty root, rising above ground; crowned with many broadish erect leaves, three or four inches long; and short erect flower-stalks, three inches high; each terminated by one large bearded flower, of different colours in the varieties; flowering in May.

Varieties are,] Dwarf Iris, with pale-purple flowers—deep-purple flowers—bluish flowers—with red-flowers—bluish-coloured sweet-scented flowers—white flowers—and with variegated flowers.

All these varieties are very pretty garden flowers, for the fronts of borders, &c.

2. IRIS *fusiana*.

Chalcedonian Black and White Iris.] Hath a thick, fleshy, spreading root, crowned by several long, narrow, sharp-edged, erect leaves, embracing one another at the base; and upright, jointed, firm stalks, two feet high; each terminated by one very large bearded flower, having the three upright petals, or standards, very broad, and variegated with black and white stripes and dusky spots, and the three falls or bending petals almost black, and constructed like an open mouth, the stamina representing the tongues; so that the whole flower exhibits a singular and formidable appearance.

3. IRIS *germanica*.

German Violet-blue Iris.] Hath a thick, jointed, fleshy, spreading root; clusters of sharp-edged, pointed leaves, a foot and a half long, embracing each other below, but spread out fan-fashion above; and upright, branchy flower-stalks, two feet high, sustaining many bearded blue flowers, one above another, the lower ones having foot-stalks; flowering in June and July, succeeded by plenty of seeds.

Variety.] Dalmatian larger light-blue-flowered.

4. IRIS *florentina*.

Florentine White Iris.] Hath a thick, fleshy, spreading root; cluster of broadish, sharp-edged leaves, a foot and a half long; and upright flower-stalks, taller than the leaves; terminated by two or three close-fitting white flowers; appearing in June and July.

5. IRIS *squalens*.

Squalid Purple and Yellow Iris.] Hath thick fleshy roots; broad, rough, sharp-edged leaves,

leaves, a foot and half long and upright flower-stalks, near two feet high; sustaining several bearded, brown, purple, and yellow flowers; petals deflexed; appearing in June and July.

6. *IRIS sambucina*.

Elder-scented Violet and Blue Iris.] Hath thick roots; broad, sharp-edged, pointed leaves, two feet long; and upright flower-stalks, about three feet high; terminated by several bearded, violet and blue flowers, having the falling petal plane, and the erect ones emarginated; and smell strongly like elder; appearing in June or July.

7. *IRIS variegata*.

Variegated Hungarian Iris.] Hath thick knotty roots; crowned by many broad, sharp-edged, pointed leaves, near two feet long; and upright stalks, two feet high, branching near the top; each division supporting two or three large bearded flowers, having the erect petals yellow, the falls white, striped with purple, and variegated stigmas; flowering in June.

8. *IRIS aphyllis*.

Leafless, or Naked-stalked, purple and White Iris.] Hath thick roots; very broad leaves, a foot or two long; and upright leafless stalks, the length of the radical leaves; terminated by three or four large, bearded, bright-purple flowers, having the falls striped with white; appearing in May.

9. *IRIS biflora*.

Twice flowering Portugal purple Iris.] Hath a thick, knotty root; broad short leaves, eight or ten inches long; and upright stalks, six or eight inches high, branching at top into foot-stalks; each supporting two or three bearded, deep-purple flowers; appearing in May, and sometimes again in autumn.

With Unbearded Flowers.

Most of these are also of the sword-leaved kind, and mostly with thick fleshy roots, all perennial, with the leaves rising in clusters from the root annually, and amidst them the flower-stalks, supporting the flower at top.

10. *IRIS verna*.

Spring-flowering Dwarf Virginia Iris.] Hath a fibrous root, crowned by a cluster of very narrow grass-like leaves, eight or nine inches long; and upright flower-stalks, shorter than the leaves; terminated by one unbearded, sweet-scented flower, having blue standards, and purple falls; flowering early in May.

11. *IRIS versicolor*.

Variable-coloured American Iris.] Hath a thick fibry root; sword-shaped leaves, a foot long; upright stalks, a little taller than the leaves; terminated by two or three unbearded flowers above one another, having light-blue

standards, and deep-purple falls, variegated with a broad white line through the middle; flowering in June.

12. *IRIS graminea*.

Grass-leaved Austrian Iris.] Hath fibry roots, narrow, flat, grassy leaves, about a foot long; upright, two-edged stalks, shorter than the leaves; terminated by two or three smallish unbearded flowers above each other, having reddish-purple standards variegated with violet, and light-purple falls, with a broad yellow stripe along the middle, adorned with purplish streaks; and a sexangular germen; flowering in July.

13. *IRIS spuria*.

Spurious narrow-leaved Meadow Iris.] Hath a thick fibry root, crowned with many very narrow leaves, near a foot long; and upright taper stalks, a little taller than the leaves; adorned with three or four unbearded flowers, having pale-blue standards, and purple variegated falls, with a white line down the middle; and a sexangular germen; flowering in July. It is a native of Germany.

14. *IRIS martinicensis*.

Martinican Blackish-yellow Iris.] Hath long narrow leaves, upright stalks, supporting two or three unbearded blackish-yellow flowers, glandulous near the base, and a trigonous germen; flowering in June or July.

15. *IRIS siberica*.

Siberian Narrow-leaved blue Iris.] Hath thick fibry roots, crowned with narrow sword-shaped leaves, a foot and a half long; upright stalks taller than the leaves; terminated by two or three unbearded flowers above each other, having light-blue standards, and deep-blue falls striped with white; flowering in July, and ripening plenty of seeds.

16. *IRIS foetidissima*.

Most Stinking Iris, commonly called Stinking Gladwin.] Hath thick fibrous roots; sword-shaped grass-green leaves, fifteen or eighteen inches high; and upright, one-angled flower-stalks, about the height of the leaves; sustaining two smallish, unbearded, blue-purple flowers, having the interior petals spreading; flowering in June and July.

Variety.] With striped leaves.

Both the varieties retain their leaves all the year, and the striped-leaved sort forms a pretty variety at all seasons; they grow wild in marshy places in England, but are admitted into gardens for variety.

17. *IRIS Pseudacorus*.

Bastard-acorus, common Yellow Flag-flower, or Water Iris.] Hath a thick, fleshy, spreading root, crowned with many long, sword-shaped, erect leaves, two or three feet in length;

length; and upright firm flower-stalks, a yard high, terminated by a few yellow flowers, having the interior petals less than the stigma; flowers in June. It grows wild in marshy places, and standing waters all over the kingdom, and is only cultivated sometimes for variety.

18. *IRIS pavonia*.

Peacock Iris.] Hath a fibrous root, crowned with smooth very narrow leaves, the stalk rises about a foot and a half high, bearing on the top one or at most two flowers, three of the petals are large and white, with a bright blue spot at the base of each, edged on the outer side with a deep purple; this delicate flower blossoms in June or July, but requires a green-house for its preservation in winter.

The first seventeen of the above species are hardy perennials, of great duration in root, but in most are annual in leaf, and all of them renew their flower-stalks annually in spring, and decay in autumn soon after they have flowered and produced seeds. They are all proper ornamental furniture for the compartments of the pleasure-garden, either in borders or to intermix in the shrubbery-clumps, between the shrubs and trees, for they will prosper in any common soil and situation, and effect a very agreeable variety during their bloom, which in the different sorts is continued two or three months, i. e. May, June, and July.

They may be planted at almost any time from September till March, though September, October, and November is the most eligible season, as they will be more firmly rooted, so as to flower strong the following summer; observing, that as most of the sorts are apt to spread greatly at root, they should be reduced occasionally, either by slipping them, or transplanting every two or three years, or as you shall see necessary to preserve them within due compass.

The propagation of all the sorts is effected abundantly by dividing their roots, as they multiply exceedingly by off-sets, which may be parted any time from September until March. I would, however, advise it to be done principally in autumn, in September, October, or November, or early in the spring, whereby they will be more firmly rooted, and flower in good perfection the following summer.

They are also easily raised from seed, which is the method to obtain new varieties: sow the seed in autumn, soon after it is ripe, any time in September, in a bed or border of common earth, and rake it in, and the plants will rise in spring following; which in autumn

should be transplanted, and they will flower a year or two after.

Hermodactyle Iris.

This was formerly a distinct genus; but its generic *Characters* prove it only a species of *Iris*.

19. *IRIS tuberosa (Hermodactylus)*.

Tuberous-rooted Iris, or the Hermodactyle, or Snake's-head Iris.] Hath a large tuberous root, consisting of large tubers; sending up several long, tetragonous or four-cornered leaves; and amidst them an upright stalk, a foot or more high, terminated by one large purple unbearded flower, in April or May; but rarely produces seed in England.

It is a native of Arabia, but is very hardy, and long an inhabitant of our gardens; is easily propagated by its tubers, which the main roots furnish by off-sets annually, and should be taken off at the decay of the leaves in summer.

This species is remarkable for striking its roots deep into the ground, often so low as to lose themselves, especially in very light soils, in which case they should be annually transplanted, when their leaves decay.

Xiphium, or Bulbous Iris.

The *Xiphium*, including the bulbous and Persian Irises, was formerly considered as a distinct genus; but, according to the Linnaean system, all the sorts are now retained as species and varieties of this genus, their characters agreeing exactly with the common *Iris*; the flowers consisting of six petals, three of them standing erect, and three reflexed backward, &c.

There are but two species, the common Bulbous Iris, and Persian Bulbous Iris; both very hardy, and the former of which is prolific in many fine varieties; the latter is also a beautiful spring flower.

20. *IRIS Xiphium*.

(*Xiphium*)—or *Bulbous Iris*.] Hath a large, roundish, fleshy, bulbous root; sending up several awl-shaped, channelled, sharp-pointed leaves shorter than the stem; amid them an upright flower-stalk, from half a foot to a foot or more high; terminated by two or three large beautiful flowers of different colours in the varieties.

Varieties of this art.] Common blue flowered bulbous Iris—with violet-coloured flowers—white flowers—purple-flowered—yellow flowering—with blue standard petals and white falls—with blue standards and yellow falls—with striped flowers—broad-leaved with blue flowers—broad-leaved purple-flowered—sweet-scented blue-flowered—sweet-scented purple flowers—with variegated sweet-

scented flowers—double-flowered: with many other intermediate varieties.

All these sorts flower beautifully in May and June, in the open borders, &c. though some a month or six weeks earlier than others, and are succeeded by plenty of seeds in autumn; and may be propagated plentifully by off-sets of the root, like other bulbs.

21. *IRIS persica*.

Persian Bulbous Iris.] Hath a large, oval, bulbous root, sending up several awl-shaped, channelled leaves, six inches long; and amid them an upright short stalk, three inches high, crowned by one or two large elegant flowers, with the interior petals spreading and serrated, having whitish-blue standards, and pearly white falls, variegated with yellow and purple, and of a fragrant scent; appearing in February and March. It is valuable both for its early bloom and the great beauty of its flowers.

Both the above species and respective varieties of bulbous Iris have great merit as flowery plants; will grow freely in any of the common borders, and are pretty ornaments for the pleasure-garden; planting them, in autumn, to adorn the principal borders, in small patches towards the front, setting them about three inches deep; they will all flower the following year at their proper season; and the bulbs will abide for years, and flower annually; it is, however, proper to take them up every second or third year at least, at the decay of the leaves, to separate the off-sets, &c.

The propagation of both these species of bulbous Iris, and varieties, is principally by the off-sets of the roots, like other bulbs, which they afford in tolerable plenty, especially if suffered to remain undisturbed two or three years, when they will be greatly increased; the proper time for lifting the roots and separating the off-sets, is in summer, when the leaves decay; managing them as other bulbs. See BULBUS.

They are also propagated by seed to gain new varieties. Sow it in September, in a bed of light sandy earth, that has only the morning sun, covering it with fine earth half an inch deep; or it may be sown in pots, boxes, or tubs of the like light soil, which may be moved at pleasure to a warm or shady situation at different seasons: the plants will rise in spring following, which in the summer twelvemonth after, at the decay of the leaves, remove from the seed-bed, and plant them into another, three inches apart, and two deep, to remain two or three years, when they will flower sufficiently strong to discover their pro-

perties; then are to be managed as the other large bulbs.

Sisyrinchium Iris.

22. *IRIS Sisyrinchium (bulbosa)*.

Greater Bulbous Sisyrinchium or Double-bulbed Iris.] Hath a double bulbous root, growing one upon another; crowned with long, narrow, channelled, sharp-pointed leaves; and an upright firm flower-stalk, half a foot high, terminated by two or three smallish blue flowers; appearing in summer.

Variety.] With yellow spotted flowers.

This species is also proper furniture to increase the variety of bulbous-rooted flowers; and its culture and propagation is the same as the two former species of bulbous Iris.

ITEA, *Itca*.

One species only, a hardy deciduous flowering shrub, constitutes this genus, and is proper for the shrubbery.

Class and order, *Pentandria Monogynia*.

Characters.] CALYX is monophyllous, acutely five-parted at top, and permanent. COROLLA, five long spear-shaped petals. STAMINA, five awl-shaped filaments, and roundish antheræ. PISTILLUM, an oval germen, cylindric permanent style, and obtuse stigma. PERICARPIUM, an oval, long, unilocular capsule, terminated by the style, and contains many small seeds.

The species is,

ITEA *virginica*.

Virginian Itca.] Hath a shrubby stem, branching out irregularly all around from the bottom upward, six or seven feet high; spear-shaped, slightly-sawed, alternate leaves; and all the branches and shoots terminated by long erect spikes of white flowers, making a fine appearance in July.

This beautiful shrub should have a place in the most conspicuous shrubbery compartments, for being so very floriferous as to appear covered with its bloom, continuing in great beauty a fortnight or three weeks.

It is propagated by seed and by layers.

The seeds arrive from America in spring, when they should be sown in pots or boxes of light sandy earth, and plunge them in the ground till next year in March; then if the plants are not come up, plunge them in a hot-bed, which will greatly promote their growth, giving frequent waterings all the summer, and allow them the shelter of a frame or green-house the two first winters; then in spring after plant them out in nursery rows a foot asunder, and in two or three years, they will be ready for the shrubbery.

Layers of the young shoots made in autumn or spring, making a slit in the part to

be layed, will be rooted by autumn following.

IVA, False Jesuits'-Bark Tree.

There are two species, one a hardy deciduous shrub for the shrubbery, and the other an herbaceous annual, but the former is the sort principally cultivated.

Class and order, *Monœcia Pentandria*.

Characters.] CALYX, male and female flowers apart on the same plant, having a roundish permanent cup, containing many florets. COROLLA, a compound convex flower, having many funnel-shaped male florets in the disk, and the females are apetalous. STAMINA, five bristly filaments, and erect antheræ. PISTILLUM, an oblong germen, two hair-like styles, and acute stigmas. PERICARPIUM, none; solitary seeds lodged naked on the proper receptacle.

The species is,

Iva frutescens.

Shrubby Iva, or False Jesuits'-Bark Tree.] Hath a shrubby stem and branches of slender growth, rising eight or ten feet high; spear-shaped sawed leaves; and monœcious pale-purple flowers, in clusters from the ends of the branches, in August or September, but no seeds in England.

It is an American shrub, but hardy enough to grow here in the open ground, and is proper for the shrubbery plantations, allowing it a dry soil, and sheltered situation.

Its propagation is by layers and cuttings; lay the young branches in spring, and they will be rooted and fit to transplant in autumn; and plant cuttings of the young shoots in April or May, in a shady border; they will readily emit roots.

JUGLANS, Walnut-Tree.

This genus consists of large, hardy, deciduous trees, eminent as fruit-trees, forest-trees, and for ornament, attaining from thirty to forty or fifty feet stature, branching into large very spreading heads, adorned with elegant pinnated leaves, and monœcious flowers in amentums and clusters.

Class and order, *Monœcia Polyandria*.

Characters.] CALYX, male and female flowers apart on the same tree; the males in oblong, cylindric, scaly amentums, each floret having a scale for its cup; and female flowers in close-sitting clusters, with a four-pointed cup to each floret. COROLLA, in the males, is a six-parted plane floret, and in the females, is acute, four-parted, and erect. STAMINA, in the males many short filaments, and acute, erect antheræ. PISTILLUM, in the females, a large oval germen under the calyx, two short styles, and large reflexed

stigmas. PERICARPIUM, a large, oval, drupaceous, unilocular fruit, inclosing a large oval or roundish, knotted, furrowed nut, nearly quadrilocular, having a four-lobed, furrowed kernel.

There are three species common to our English plantations, each comprehending some varieties, though the common walnut is that which is most generally cultivated, both as a fruit and timber tree; all the others, however, are equally hardy, produce eatable fruit, though with much smaller kernels than the common sort; therefore the common walnut is the most eligible for general culture for the fruit; but considered as ornamental and forest trees, all the sorts are proper.

The species are,

1. JUGLANS regia.

Royal, or Common Walnut-tree.] Grows fifty feet high, or more, with a large upright trunk, branching into a very large spreading head; large pinnated leaves, of two or three pair of oval, smooth, somewhat serrated lobes, terminated by an odd one; and monœcious flowers; succeeded in the females by clusters of large green fruit, inclosing furrowed nuts of different shapes and sizes in the varieties; ripen in September and October.

Varieties are,] Common oval Walnut—round Walnut—large Walnut—small-fruited Walnut—double Walnut—early Walnut—late Walnut—tender thin-shelled Walnut—hard thick-shelled Walnut.

There are some other seminal variations; for plants raised from the nuts of the same tree will often produce different varieties of fruit, as is common with most other fruit-trees. The wood, leaves, and outer covers of the fruit of all the varieties of this species are extraordinary bitter; and the skin of the kernel is a strong bitter astringent, which should be peeled off; the kernel then eats very palatable, with an agreeable flavour.

2. JUGLANS nigra.

Black Virginia Walnut.] Grows forty or fifty feet high, with a large trunk, and very branchy spreading head; large pinnated leaves, consisting, in different varieties, of from five or six to ten or twelve spear-shaped, sawed lobes, terminated by an odd one, the lower lobes the least; and monœcious flowers, succeeded by rough, hard-shelled nuts, differing in shape and size in the varieties.

Varieties are,] With round fruit—with oblong, deeply-furrowed fruit—with aromatic-scented leaves.

3. JUGLANS alba.

White Virginia Walnut, commonly called Hickory Nut.] Grows thirty feet high, having pinnated

pinnated leaves, which, in different varieties, consist of from two or three to six or seven pair of spear-shaped, sawed lobes, terminated by an odd one; and monœcious flowers, succeeded by oval smooth nuts, having a whitish shell.

Varieties of this are,] Smooth-barked white Virginia Walnut—thag-bark white Virginia Walnut, having the stem and older branches covered with a rough scaly bark—with large fruit—with small fruit.

The flowers of all these trees are male and female apart on the same plant; the males commonly in oblong, cylindric catkins, and the females in close clusters, appearing generally in April and May; succeeded, in the females, by large, roundish, green fruit, each including one nut, having a hard shell filled with an eatable kernel; but those of the common Walnut are the largest and finest flavoured; all of them ripening in September and October.

All the three species and respective varieties are very hardy, and prosper in any common soil; they are all deciduous; their leaves come out in May, and fall off in October and November.

They are all employed occasionally in plantations, both as forest-trees for timber, and to intermix in plantations for ornament, and the *Juglans regia* also as a fruit-tree; all the sorts are also peculiarly adapted to plant as detached single objects in parks and paddocks, as having very large, regular spreading heads; they have likewise a fine effect, disposed in groups of three or more trees together at sufficient distances from one another for their heads to spread; and are also proper to use in assemblage to form avenues, and to plant in hedge-rows, in the boundaries of fields and other open places; for they will thrive either on plains, the sides of hills, or in vales, in almost any ground, but delight most in a loamy soil.

They are all of large spreading growth; but the first and second species are the largest growers; their trunks acquire a considerable stature and substance, and divide into very large arms, forming monstrous spreading heads, particularly the common Walnut; the black Virginia Walnut, however, grows rather the most upright.

Considered as forest or timber-trees, they are also all very proper to be admitted in that tribe, and placed among the hardy deciduous kinds, for their timber is valuable for many purposes; not, however, where strength is necessary, it being of a very brittle nature, but the cabinet-makers and joiners esteem it

greatly for several sorts of household furniture, and other light works; for the wood being beautifully veined, takes a fine polish; and the more knotty it is, the more it is valued for particular purposes.

With respect to their merit as fruit-trees, all the sorts produce fruit here, but the common Walnut the largest, most plentiful, and finest eating; the others having very small kernels. The common Walnut-tree, therefore, is the only proper species of *Juglans* to cultivate as a fruit-tree for the sake of the Walnuts; and it may be planted as standards in orchards, like other fruit-trees, but at a greater distance, as having large spreading heads; or are well adapted for planting round the boundaries of orchards, where they will also guard the other lesser fruit-trees from boisterous winds; and may be planted as fruit-trees, in parks or paddocks, and in rows round fields, or in any open place where thought convenient; they are raised plentifully from the nuts, and planted out in nursery-rows, as directed below; and in five or six years the plants will be six or eight feet high, with firm stems and handsome heads, when they may be planted out where they are to remain; though the younger these trees are planted out, the better they will succeed; or if the nuts were planted at once where the plants are always to stand, the trees would still be of more quick and larger growth; observing, in either mode of planting, that as the trees branch out into very spreading heads, they should stand thirty or forty feet each way asunder; planting them with their heads entire, and suffer their branches and shoots always to advance according to their own natural growth, without shortening; for the trees produce their fruit on the short young shoots arising towards the extremity of the branches, so should never be shortened except in cases of very irregular growth, or great ramblers. See STANDARD FRUIT-TREES.

It is, however, a common opinion, that beating these trees with long poles to get down the fruit (which consequently breaks many of the shoots), promotes their bearing; the only reason that can be assigned for this opinion is, that the trees producing their fruit upon the young shoots of the last and same year, as aforesaid; and that by beating the branches with long poles, as the most expeditious way of gathering the fruit from large trees, it breaks off many older shoots, also the ends of many of the young ones, which probably, like shortening with a knife, forces out a greater supply of lateral young shoots the following year for bearing. I should, however, in the operation

operation of beating down the fruit, be for saving the branches as much as possible.

These trees seldom begin to bear fruit till they are seven or eight years old, but never any considerable quantity till they are treble that age, when they have formed large heads.

The fruit is used at two different stages of growth; when green, to pickle; and when ripe, to eat raw.

As a pickle, the young green walnut, when about half or near three parts grown, before the outer coat, and internal shell becomes hard, is a most excellent vegetable pickle; and for which purpose they are generally ready in July and August; observing that for this use they must be gathered by hand, chusing such as are as free from specks as possible.

The ripe fruit discovering full maturity by the outer husk easily separating from the nut, or the husks sometimes opening that the nut drops out, will be fit in the latter end of September and October, which, as before noticed, in trees of considerable growth, is commonly beat down with long poles, especially on large trees; for as the Walnuts grow mostly at the extremity of the branches, it would, in very large spreading trees, be troublesome and tedious work to gather them by hand. As soon as gathered, lay them in heaps a few days to heat and sweat, to cause their outer husks, which closely adhere, to separate from the shell of the nuts; then clean them from the rubbish, and deposit them in some dry room for use, covering them over close with dry straw, a foot thick, and they will keep three or four months.

Walnuts are always ready sale at market, in large towns, such as London, &c. where, at their first coming in, they are brought with their husks on, and sold by the sack, or bushel, but afterwards are brought clean, and sold both by measure and by the thousand.

Thus plantations of Walnut-trees are profitable in their annual crops of fruit while growing, and in their timber when felled.

Propagation of all the Sorts.

The propagation of all the sorts of these trees is most commonly by planting the nuts, which grow freely in beds of common earth.

For those of the common Walnut intended for fruit-trees, the best varieties of nuts should be procured, such that are large, thin-shelled, and with the finest flavoured kernels; for although the finest sorts will vary or degenerate, yet by planting only the very best, there will be the greater chance of having a succession continued without much degeneracy.

Having procured the nuts at the proper

season, when perfectly ripe, in their outer cover or husks, if possible; they should be preserved in dry sand until February, and then planted: at which time having the ground dug, draw drills two inches and a half deep, and a foot asunder, in which plant the nuts four or five inches apart, and cover them over with the earth; they will come up the same spring, and by the end of summer the young plants will be half a foot or more high, which, after having two years' growth in the seed-bed, plant them out in the nursery; previously, when taken up, shorten their tap-roots, but preserve their tops entire, and plant them in rows two feet and a half asunder, and about eighteen inches distant in each row: here they are to remain a few years, training them with single stems, till five or six feet high, or a little more or less; then transplant them where they are finally to remain.

Those intended principally as timber trees as well as to bear fruit, should be always planted out for good when from about four or five to six or eight feet high; or if the nuts were planted at once where the trees are designed to remain, without transplanting, they would assume a quicker and stronger growth.

The nuts of the second and third species are annually sent hither from America, and may be had of most of the nursery-men and seed-dealers; they commonly arrive in spring, and should be sown as soon as possible after their arrival, in the same manner as directed for the common Walnut.

JUNIPERUS, Juniper-tree, comprehending also some Cedars and all the Savins.

This genus furnishes beautiful ever-greens of the shrub and tree kind, for ornamental plantations, growing from three or four to thirty or forty feet high in different sorts, often branchy to the very bottom, and of pyramidal growth; closely garnished with very small narrow leaves, placed mostly imbricatum, remaining all the year; and dioecious flowers, of no beauty, succeeded by small berries.

Class and order, *Diacia Monadelphica*.

Characters.] **CALYX**, male and female flowers on different plants; the males in a conical amentum, by threes, having broad, scaly, imbricated calyces; and the females a small three-parted cup, placed on the germen. **COROLLA**, none in the males, and in the females three stiff, permanent petals. **STAMINA**, three united filaments, and three antheræ. **PISTILLUM**, a germen under the calyx of the females, three styles, and simple stigmas. **PERICARPIUM**, a roundish, fleshy berry, having three seeds.

In this genus are retained also several of the *Cedrus*, or Cedars; and the *Sabina*, or Savin, of former botanists, which they ranged as distinct genera, but are found to be only species of the *Juniperus*. There are several species: all of them, except the common Juniper, are foreigners, but all tolerably hardy, succeed in the open ground, and are great ornaments to our ever-green plantations.

The species are,

1. *JUNIPERUS communis*.

Common Juniper.] Of which there are the two following

Varieties.

Common Shrubby English Juniper.] Grows five or six feet high, branching closely from bottom to top; forming a very close bushy plant, thickly garnished with narrow, awl-shaped, acute-pointed, spreading leaves by threes; and small yellowish flowers in spring; succeeded, in the female plants, by purplish berries, ripening the following year in autumn.

This variety grows wild in England, &c. upon barren heaths and commons, where it produces abundance of berries; but is cultivated in gardens, and trained for an ornamental shrub, to increase the variety in shrubbery plantations.

Tree-like Swedish Juniper.] Grows ten or twelve feet high, very branchy the whole length, with the branches growing more erect, and leaves, flowers, and fruit like the former variety. Is a native of Sweden and Denmark.

2. *JUNIPERUS Oxycedrus*.

(Oxycedrus)—or Brown-berried Spanish Juniper.] Grows ten or fifteen feet high, closely branched from bottom to top; short, awl-shaped, spreading leaves by threes and fours, and small dioecious flowers, succeeded by large reddish-brown berries.

3. *JUNIPERUS thurifera*.

Thuriferous Greater Blue-berried Spanish Juniper.] Grows twenty feet high, or more, branching in a conic form; acute, imbricated leaves, by fours, and small dioecious flowers, succeeded by large blue berries.

4. *JUNIPERUS virginiana*.

Virginia Red Cedar.] Grows thirty or forty feet high, branching from bottom to top, in a conic manner; small leaves by threes adhering at their base, the younger ones imbricated, and the old ones spreading; and dioecious flowers, succeeded by small blue berries.

5. *JUNIPERUS lycia*.

Lycian Cedar.] Grows twenty feet high, branching erectly, garnished with small oval

obtusely leaves, every where imbricated; and dioecious flowers, succeeded by large oval brown berries. Is a native of Spain and Italy.

6. *JUNIPERUS phœnicia*.

Phœnician Cedar.] Grows about twenty feet high, branching pyramidally; adorned with ternate and imbricated obtuse leaves; and dioecious flowers; succeeded by small yellowish berries. Is a native of Portugal.

7. *JUNIPERUS bermudiana*.

Bermudian Cedar.] Grows twenty or thirty feet high; has small acute leaves, by threes below, the upper ones awl-shaped, acute, and decurrent, by pairs or fours, spreading outward; and dioecious flowers, succeeded by purplish berries. Is a native of Bermudas.

8. *JUNIPERUS Sabina*.

(Sabina)—the Savin-tree; Of which there are the following

Varieties.

Spreading Savin.] Grows but three or four feet high, with horizontal, very spreading branches; short, acute-pointed, decurrent, erect, opposite leaves; and dioecious flowers, succeeded by bluish berries; but very rarely produces either flowers or fruit.

This variety is used in medicine; and it is said the juice of the leaves, mixed with milk and honey, is excellent for expelling worms in children; and a poultice thereof cures scald heads; the juice of it is also said to clear the face from freckles; and the farriers esteem it greatly for destroying worms in horses, it being a powerful operator that way; and its virtues are accounted excellent for many other disorders.

Upright Larger Portugal Savin.] Grows eight or ten feet high, with upright branches, dark-green leaves, nearly like the former sort, and dioecious flowers, succeeded by plenty of berries.

Variegated Savin.] Having the ends of many of the shoots and young branches variegated with white, and the leaves finely striped, the whole appearing very beautiful.

All these species of *Juniperus* are very pretty ever-greens, of the tree and shrub kind, mostly of picturesque growth, branching out all around closely from bottom to top; all of them very closely garnished with leaves, which, although in general very short and small, yet are so numerous and thickly set, that the plants appear every way very close and beautiful; and all the sorts are excellent furniture for all ornamental plantations, where they will have a fine appearance at all seasons of the year, as being always clothed with leaves;

leaves; but as to their flowers, they have no beauty, except to the botanists for observation; and as to fruit, the common Junipers produce plenty, also some of the others; but the Cedars rarely furnish many berries in England; nor do the spreading Savins, though the upright kind often produce such plenty as to have a very agreeable effect on the plants.

They all succeed in the open ground, and will grow in any common soil and situation, in common with other hardy trees, though they are rather the most prosperous in a light sandy soil.

In disposing all these kinds of plants in the shrubbery plantations, good attention should be had to arrange them according to their degrees of growth, so as to exhibit a regular gradation of height, placing the low-growing sorts, such as the *Juniperus communis*, and the Savin kinds, towards the front; and the other larger growers more backward in proportion to their several statures, placing all of them in assemblage with other ornamental shrubs and trees, principally of the ever-green tribe; or some may also be placed as single standards, on open compartments of grass in the pleasure-ground.

Some of the large-growing sorts may also be introduced into the forest-tree plantations; as in their native countries they afford excellent timber for many uses, more particularly the Virginia Cedar, which also arrives to a considerable stature here, especially if the under branches are trimmed off occasionally while young, to promote their aspiring in height; they will grow very straight, with fine regular heads.

Most of these species of *Juniperus* emit a strong aromatic balsamic odour, and abound more or less with a resinous juice, of so exceedingly bitter quality, as to prevent the timber, when converted to economical uses, from being eaten and destroyed by vermin.

Propagation of all the Sorts.

The propagation of all the Juniper and Cedar kinds is by seed; and the Savins principally by layers and cuttings; but may likewise be raised from the berries, if they can be procured; and the seeds of all the sorts are to be sown in beds of common light earth, except the Cedar of Bermudas, which must be sown in pots, to have shelter in winter.

The seeds of all the sorts may be had at most of the nurseries and seedshops; observing that such sorts which can be procured in autumn, should be sown at that season, whereby they will more certainly come up the spring following; as those that are not sown till

spring, sometimes many of them remain in the ground till that time twelvemonth, before they germinate or sprout, unless aided by a hot-bed. Some of the sorts, however, rarely produce much seed here: it is procured annually from the countries where the trees naturally grow, by the seedsmen, commonly arrives early in spring, and should be sown as soon after their arrival as possible.

All the sorts, except the Bermudas Cedar, as before observed, are to be sown in beds of light earth, in the full ground. Having dug the ground, and raked it fine, sow the seeds evenly on the surface, and cover them with fine earth, half an inch deep. Those sown in autumn will, many of them, come up in April or May following; but the spring sowings will rarely appear till the following Spring. In either case, however, keep the beds clean weeded all summer; and those plants that are up, now and then watered. When they have had two years' growth in the seed-bed, plant them out, in autumn or spring, in nursery rows, two feet asunder, there to remain till of due size for final transplantation into the shrubbery, &c.

The Bermudas Cedar, as above noticed, being tender, it should be sown in pots or tubs of light earth, to be moved under a frame in winter to be sheltered from frost; and when the plants are a year or two old, plant them in separate small pots, to be sheltered also in winter three or four years, till they have acquired some size and strength, then turned out of the pots into the full ground where they are to remain, in a warm situation, where let them take their chance; though a shelter of mats for the first winter or two, during hard frosts, will be of great service.

The season for transplanting all the sorts is either in autumn, October or November, or in March and early in April.

JUSTICIA, (*Adhatoda*) Malabar Nut.

It consists of shrubby and herbaceous plants, of the Indies, for the green-house and stove, adorned, some with fine large leaves, others with small narrow foliage, and all of them with monopetalous ringent flowers.

Class and order, *Diandria Monogynia*.

Characters.] CALYX is small and acutely five-parted at top. COROLLA is monopetalous and ringent. STAMINA, two awl-shaped filaments, and erect anthera. PISTILLUM, a turbinate germen, slender style, and simple stigma. PERICARPUM, an oblong bilocular capsule, opening with elastic force, and darting out its roundish seeds.

There are many species, but not more than two common to the English gardens, both

of them of the shrub kind for the green-house, viz.

1. JUSTICIA *Adhatoda*.

(*Adhatoda*)—or *Atalabar-Nut*.] It grows twelve or fifteen feet high, with a strong woody stem, branching out widely all around; large lanceolate-oval leaves, placed opposite; and from the ends of the branches short spikes of white flowers, with dark spots, having the helmet of the corolla concave.

2. JUSTICIA *hyssopifolia*.

Hyssop-leaved Justicia, or *Snap-tree*.] Hath a shrubby stem, branching from the bottom pyramidally three or four feet high; spear-shaped, narrow, entire leaves, growing opposite; and white flowers, commonly by threes, from the sides of the branches; succeeded by capsules, which burst open with elastic force, for the discharge of the seeds. Hence the people of India call it Snap-tree.

3. JUSTICIA *Ecbolium*.

(*Ecbolium*)—*Reflexed-flowered Ceylon Justicia*.] With a tree-like stem, lanceolate-ovate leaves, and flowers with the upper lip reflexed.

4. JUSTICIA *picta*.

Painted or Spotted-leaved Justicia.] With a shrubby stem, lanceolate-ovate, painted, spotted leaves, and the jaws of the corolla inflated.

5. JUSTICIA *scorpioides*.

Scorpion-tail vera-crucian Justicia.] With a shrubby stem, lanceolate-ovate, hairy, sessile leaves, and flower-spikes reflexed like a scorpion's tail.

All these species flower here in summer, in our green-houses and stoves, but never produce fruit in these parts.

They are natives of India, so are tender, and must be kept in pots of light rich earth, and placed in a good green-house in winter, or may be placed in a hot-house, particularly the last four sorts; though they will live in the open air in summer, and in a warm green-house in winter, but rather more successfully in a stove; managing them as other shrubby exotics of all those departments.

The propagation of all the sorts may be effected by layers and cuttings. The laying is performed in spring, in the pots; and cuttings of the young shoots may be planted any time in spring or summer, in pots, and plunged in a hot-bed, or in the bark-bed in the stove, giving water, and occasional shade from the sun; they will readily take root.

IXIA (*Ixia*).

This genus consists of herbaceous, bulbous, and tuberous-rooted flowery perennials for the pleasure-ground and green-house, growing a

foot or two high, terminated by hexapetalous flowers.

Class and order, *Triandria Monogynia*.

Characters.] CALYX, oblong permanent spathæ. COROLLA, six oblong, spear-shaped, equal petals. STAMINA, three short filaments, and simple antheræ. PISTILLUM, an oval triquetrous germen under the receptacle, erect style, and trifid stigma. PERICARPium, a roundish, three-cornered, trilocular capsule, having roundish seeds.

There are several species, the most material of which are:

Hardy Kinds.

1. IXIA *Bulbocodium*.

(*Bulbocodium crocifolium*)—*Crocus-leaved Bulbocodium*, or *Large-flowered Ixia*.] Hath a small bulbous root, crowned by several narrow leaves; and very short flower-stalk, terminated by a large crocus-like flower, of different colours in the varieties.

Varieties.] With white and yellow flowers—with purplish and yellow flowers—blue and white flowers—white flowers—variegated flowers.

2. IXIA *chinensis*.

Chinese Ixia.] Hath a thick, tuberous, knotty root; upright jointed flower-stalk, two feet high; garnished with sword-shaped leaves a foot long; and the stalk dividing upward into forks, sustaining yellow, red-spotted flowers, remote, in forked panicles; appearing in July and August.

Tender Kinds.

3. IXIA *bulbifera*.

Bulb-bearing Ixia.] Hath a bulbous root, crowned with narrow leaves, six or eight inches long; and upright flower-stalks, a foot and a half high; garnished with leaves, bulbs growing at the joints; and terminated by sulphur-coloured flowers, placed alternate.

4. IXIA *crocata*.

Saffron-coloured Ixia.] Hath a bulbous root, sending up sword-shaped leaves, near a foot long; and upright flower-stalks, a foot or more high, terminated by clusters of deep orange-coloured flowers, arranged alternate, having each a large black spot at the base; flowering in May.

5. IXIA *africana*.

African Woolly-headed Ixia.] Hath a small bulbous root, sending up very narrow leaves; a short flower-stalk, three or four inches high, terminated by flowers collected into woolly heads.

6. IXIA *longiflora*.

Long-flowered Ixia.] Hath a bulbous root, sending up straight, linear, sword-shaped leaves, eight or ten inches long; and upright round

round flower-stalks, a foot or more high, terminated by a spike of light yellow flowers, with a very long slender tube to each.

7. *IXIA caelestina*.

Celestine Blue-flowered Ixia.] Hath a roundish, bulbous root, sending up linear, lanceolate leaves, seven inches long, and upright round flower-stalks a foot high, terminated by a spike of large sky-blue, expanding, pentandrous flowers.

8. *IXIA polystachia*.

Many-spiked Ixia.] With linear leaves, and flower-stalks having many spikes of white flowers.

9. *IXIA flexuosa*.

Flexible-spiked Ixia.] With linear leaves, and racemous, bending, flexible-spikes of white flowers.

10. *IXIA scillaris*.

Scilla-amœna-flowered Ixia.] With sword-shaped, striated leaves, and elongate spikes of blue flowers.

11. *IXIA corymbosa*.

Corymbous-flowered Ixia.] With two edged stalks, and blue flowers, in corymbous bunches.

The following are also retained in some collections.

IXIA pulcherrima.—Most beautiful *Ixia*.

IXIA longicaulis.—Long-stalked *Ixia*.

IXIA maculata.—Spotted-flowered *Ixia*.

IXIA speciosa.—Specious-flowering *Ixia*.

IXIA tubiflora.—Tube-flowered *Ixia*.

IXIA plicata.—Plicated *Ixia*.

These in their mode of growth are similar to the foregoing species, and succeed by the same culture and method of propagation.

The flowers of all these plants are composed each of six oblong petals, appearing in summer; and, in warm seasons, some sorts are succeeded by ripe seeds.

The plants are all permanent in root, but annual in leaves and stalk.

The two first species may be planted in the open borders; the second, however, being rather tender, should have a warm situa-

tion; and some of both sorts may be planted in pots to remove to shelter of a green-house or garden-frame in winter, in case those in the open ground should be killed by hard frost.

The other species must be planted in pots of rich light earth, for moving into the green-house or garden-frame all winter.

All the sorts propagate plentifully by off-sets of their roots, which should be taken off in summer at the decay of the leaves, &c.

IXORA. Indian Wild Jasmine. A genus, furnishing some fine ornamental-flowering, shrubby exotics for the stove, of four or five feet growth, producing beautiful, monopetalous, long-tubed flowers.

Class and order, *Tetrandria Monogynia*.

Characters.] *CALYX*, small, erect, cut into five segments, and permanent. *COROLLA*, monopetalous and funnel-shaped, tube, long, narrow, and cylindraceous, with the border flat, and divided into four parts. *STAMINA*, four very short filaments, topped with oblong antheræ. *PISTILLUM*, a roundish germen, style slender, and a bifid stigma. *PERICARPIUM*, a roundish bilocular berry containing four seeds.

The species in our gardens are,

IXORA coccinea.

Scarlet Indian Ixora.] Rises with a single woody stem, about four feet high: the branches are garnished with large, oval, pointed, stiff, laurel-like leaves; the flowers grow in a large umbel, and are of a rich scarlet colour.

This splendid exotic is commonly kept in the stove, though it, probably, may safely be kept in the green-house; it flowers in June and July, and is propagated by seeds and cuttings in the spring and summer months.

IXORA alba.

White-flowered Indian Ixora.] A shrubby stem branching four feet high: ovate-lanceolate leaves, and terminal bunches of white flowers.

This requires the same culture as the other, and is propagated by the same means.

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KALMIA, *Kalmia*.

Of this genus are four hardy ever-green shrubs for the pleasure-ground, growing two, four, or five feet high; adorned with oval, and spear-shaped entire leaves, and monopetalous, five-parted flowers, in close round bunches.

Class and order, *Decandria Monogynia*.

Characters.] CALYX is small, five-parted, and permanent. COROLLA is monopetalous, with a cylindric tube, and the limb divided into five roundish spreading segments. STAMINA, ten filaments, and simple antheræ. PISTILLUM, a roundish germen, slender style, and obtuse stigma. PERICARPIUM, a roundish quinquelocular capsule having numerous small seeds.

The species are,

1. KALMIA latifolia.

Broad-leaved Kalmia.] Hath a shrubby branching stalk, growing five or six feet high; oval, stiff, shining green leaves, placed irregularly; and corymbose clusters of pale-red flowers terminating the branches.

2. KALMIA angustifolia.

Narrow-leaved Kalmia.] Hath a shrubby stalk, dividing into many slender branches, growing four or five feet high; spear-shaped, stiff, shining-green leaves, placed irregularly; and corymbose clusters of bright-red flowers from the sides of the branches.

3. KALMIA glauca.

Glaucous Kalmia.] Hath a shrubby branching stalk, growing a foot or more high, garnished with oblong, pointed leaves, glaucous underneath, and growing opposite in pairs, an inch long; and pink-coloured flowers in small clusters at the ends of the branches.

4. KALMIA hirsuta.

Hairy Kalmia.] Hath a shrubby, upright, hairy stem and branches, arising to two or three feet high, garnished with oval, spear-shaped, hairy leaves; the flowers, which grow in a raceme up the branches, are of a red-purple colour.

These shrubs are beautiful ever-greens, natives of America, but hardy enough to succeed any where in the open ground in this country.

They flower in June or July; each flower

is of one petal, tubular below, and five-parted and spreading above; those of all the species are very ornamental, but they are rarely succeeded by ripe seeds in England.

These shrubs are elegant furniture for ornamental plantations, and should be placed towards the front of the most conspicuous shrubbery compartments.

Their propagation is by seed, suckers, and layers.

By Seed.—This arrives from America in spring: sow it either in beds of light ground, or in pots or boxes of light sandy earth, half an inch deep, and plunge them in an easterly border till spring following; and then, if the plants do not come up before, if the pots are plunged in a hot-bed, it will forward them greatly; but inure them betimes to the full air all summer; and in winter give shelter from frost; and when two years old, plant them in separate pots, to move to shelter for two more winters; then let them be planted out in the full ground.

By Suckers.—The plants, after a few years' standing, send up suckers in tolerable plenty, which should be taken off in spring, and planted in nursery rows for two, three, or more years, to acquire strength, then transplanted for good.

By Layers.—In autumn lay some of the young shoots of last summer, and they will be rooted in a year or two.

KÆMPFERIA, *Galangale*.

This genus consists of low, herbaceous, flowery perennials of India, for the stove, adorned with radical, oval, and spear-shaped leaves, and monopetalous, tubular, six-parted flowers.

Class and order, *Monandria Monogynia*.

Characters.] CALYX is obsolete, and placed above the germen. COROLLA is monopetalous, with a long slender tube below, and six-parted above; three of the parts are spear-shaped, two are oval, and the lowest is divided into two obcordate segments. STAMINA, one membranaceous suboval filament, and linear anthera, growing along the filament its whole length. PISTILLUM, an oval germen, simple style, and obtuse stigma. PERICARPIUM,

PIUM, a roundish trilocular capsule, having many seeds.

There are but two species, both of low growth, and acaulous, i. e. having no stem; the leaves and flowers rising directly from the root annually.

The species are,

1. *KÆMPFERIA Galanga*.

[*Galanga*—or *Galangal*.] Hath tuberous, thick, oblong, fleshy roots, crowned with oval, close-fitting leaves, by pairs, four or five inches long, without foot-stalks; and between them close-fitting white flowers, with purple bottoms, growing singly.

2. *KÆMPFERIA rotunda*.

[*Round Kæmpferia*.] Hath thick, fleshy, swelling, roundish, clustering roots, sending up spear-shaped leaves, six or eight inches long, near half as broad, on upright foot-stalks; and between them, immediately from the root, rise whitish flowers, tinged with green, red, yellow, and purple centres.

Both these are perennial in root; but the leaves rise annually from it in spring, and decay in winter.

They flower in summer; each flower is of one petal, tubulous below, but plane above, and divided into six parts; continuing three or four weeks in beauty, but never succeeded by seeds in England.

Both these plants must be potted in light rich mould, and always kept in the hot-house giving plenty of water in summer, but more sparingly in winter. They are propagated by parting their roots in spring, just before they begin to push forth new leaves.

KIGGELARIA, Kiggelaria.

There is but one species, an evergreen shrub of Africa, retained here in green-house collections, for variety; and is a diœcious plant.

Class and order, *Diœcia Decandria*.

Characters.] CALYX, diœcious flowers, having monophyllous, five-parted cups. COROLLA, five spear-shaped, concave petals. STAMINA, ten small filaments, and oblong antheræ. PISTILLUM, a roundish germen, five styles, and obtuse stigmas. PERICARPIMUM, a globular, rough, unilocular capsule, having angular seeds.

The species is,

KIGGELARIA africana.

[*African Kiggelaria*.] Hath an upright woody stem, and purplish branches, growing fifteen or eighteen feet high; oblong, sawed, alternate leaves; and diœcious, greenish-white flowers, in clusters from the sides of the branches; succeeded by globular rough fruit, the size of cherries, containing the seeds, which seldom ripen here.

This plant must be potted in rich garden-mould, and placed among the green-house plants, to have shelter in winter, managing it as other woody kinds.

It is propagated by seeds, layers, and cuttings, though both layers and cuttings root sparingly.

Sow the seed in pots, and plunge them in a hot-bed; and when the plants are come up three or four inches high, plant them in separate small pots, plunging them also in the hot-bed till fresh rooted; then harden them to the full air the rest of summer.

Layers should be made in summer of the young shoots of the year.

And cuttings of the young shoots may be planted in spring in pots, and plunged in a bark-bed or other hot-bed; and if close covered with a hand-glass, they will more readily succeed.

KITCHEN-GARDEN, a principal district of garden-ground allotted for the culture of all kinds of esculent herbs and roots for culinary purposes, &c.

A Kitchen-garden may be said to be the most useful and consequential part of gardening; since its products plentifully supply our tables with the necessary support of life: for it is allowed that health depends much on the use of a proper quantity of wholesome vegetables, so that it is of much importance for every person possessed of a due extent of ground to have a good Kitchen-garden for the supply of his family. This garden is not only useful for raising all sorts of esculent plants and herbage, but also all the choicer sorts of tree and shrub-fruits, &c. both on espaliers, wall-trees, and standards; as the annual cultivation of the ground by manuring, digging, hoeing, &c. necessary in the culture of the esculent herbage, also greatly encourages all sorts of fruit-trees, preserves them in health and vigour, so as always to produce large and fair fruit: for which reason, in the Kitchen-garden should always be planted the choicest sort of fruit-trees, particularly for walls and espaliers; likewise some standards, if set a considerable way asunder, so as not to shade the under-crops too much; and when the trees are judiciously disposed, there will be almost equally the same room for the crops of herbaceous esculents as without trees; so that this garden may be reckoned both as a Kitchen and fruit-garden.

As to the place of disposition of this garden respecting the other districts, if it is designed principally as a Kitchen and fruit-garden, distinct from the other parts, and there is room for choice of situation, it should generally be placed

placed detached entirely from the pleasure-ground; also as much out of view of the habitation as possible, at some reasonable distance, either behind it, or towards either side thereof, so as its walls or other fences may not obstruct any desirable prospect either of the pleasure-garden, park, fields, or the adjacent country; having regard, however, to place it, if possible, where the situation and soil is eligible, as hereafter illustrated; and if its situation is unavoidably such as to interfere with the pleasure-gardens, so as its walls may be thought disagreeable to view, they may be shut out from sight by intervening plantations of shrubs and trees.

But as in many places they are limited to a moderate compass of ground, in others have scope enough, and require but a moderate extent of garden; may in either case, have often the Kitchen, fruit, and pleasure-garden all in one; having the principal walks spacious, and the borders next them of considerable breadth; the back part of them planted with a range of espalier fruit-trees, surrounding the quarters; the front with flowers and small shrubs; and the inner quarters for the growth of the kitchen vegetables, &c.

The proper Situation, Soil, Water, Extent, &c.

As to situation,—on this head we can only observe in general, that both high and low situations, if the soil is proper, will produce good crops of esculent herbage and fruits; though a moderately low situation, by being less exposed to the influence of cold and violent winds, may suit winter and early crops, both of herbs and trees, better than high-lying ground, provided, however, it is moderately dry, and not too retentive of moisture in winter. A situation having a moderate slope is very eligible for this purpose, as in such a spot there will not be any danger of water standing, nor of being too wet at any season; and if it slopes toward the South, it is a most desirable situation, as it will not only be better defended from the cold northerly winds, but its exposure or aspect inclining to the sun, we may always expect to have the earliest crops; or if, when the situation is in some parts a little elevated, or gently sloping, and in others low and moist, it may be some advantage, as the higher or sloping ground will suit some early crops, and for wintering several sorts of plants that are impatient of copious moisture in that season, such as lettuce, &c. and the low ground will be eligible for late summer crops, as peas, beans, cauliflowers, transplanted lettuce, and several others. However, as to choice of situation

and soil, this is practicable in large estates; but where persons are limited to a moderate space, they must be content with such as nature affords; observing in this case, that if the natural soil is of a proper temperament and depth, we need not be under any great anxiety about the situation, if it is moderately dry, and not apt to be overflowed in winter; even in that case, it may be remedied, or greatly helped, by digging two or three long narrow canals, and from these some under-ground hollow drains, the earth from which will help to raise the contiguous ground higher, and the water in the canals will be convenient for watering the plants. Remark that a situation too wet in winter should be guarded against as much as the nature of the place will admit; for in such land we can never have early nor good general crops, nor will the fruit-trees be prosperous.

With respect to soil (see EARTH)—the soil for a Kitchen-garden, of all others, requires to be naturally good, of depth enough for the growth of the large perpendicular esculent roots, as carrots, parsneps, red beet, horse-radish, &c. also for the growth of fruit-trees, a very material article; so that the proper soil for these general purposes should, if possible, be from about a foot and a half to two feet deep, or more; but much less than a foot and a half depth will be a great disadvantage; so much depends upon the quality of the soil for a Kitchen and fruit-garden, that where there is scope of ground to chuse from, we cannot be too cautious at first in fixing on a proper spot, where the soil is good, and depth enough, as above, before gravel, clay, chalk, or other bad soils are come at; which should always be more particularly attended to when designed to furnish the ground with a choice collection of fruit-trees, either for the walls, espaliers, or standards; for, without a due depth of good earth, these will neither bear well, nor be of long duration.

Different sorts of soils are met with in different parts, as loamy, clayey, sandy, &c. A loamy soil, either of a brown or black colour, is the best that can be for this purpose, more particularly a light sandy hazel loam, which always works pliable at all seasons, not apt to be too wet and cloggy at every shower of rain, nor bind in dry hot weather; this soil, however, although in many places it is the most general superficial earth in this country, is not common to all parts. A clayey, strong, stubborn soil is the worst of all earths, and must be mended by sandy materials and coal-ashes, and other light substances. A sandy soil is common in many places, which if of
a very

a very light sharp nature, it must be fertilised by plenty of rotten dung, and strong earths, where they can be easily procured.

It is observable that ground which constantly produces good crops of corn and grass, is also proper for the growth of all esculent herbs and fruit-trees.

Chuse, however, the best soil you can, according to the situation and extent of your ground; and if it happens to prove unfavourable, art must assist; for if it is of a light sandy nature, it may easily be mended, by adding store of any kind of rotten or other good dung; and if of a very light, sharp, hungry temperament, earths of stronger substance, such as loam, and the like, if it can be easily obtained, must be added occasionally along with plenty of dung, working the whole with the natural soil of the garden; and should your garden be of a clayey, cold, damp nature, add light materials, both on manural composts, and light sandy soils; nothing is more proper than plenty of coal ashes, &c. for opening and warming all tough, stubborn, cold soils; and these may be always procured in plenty almost every where, at an easy expense. See COMPOST, EARTH, &c.

Water is a very essential article in a Kitchen-garden in summer, to water all new transplanted plants, and others that cannot subsist without a due supply of moisture during the drought of that season; therefore, in large gardens, where practicable, one or more reservoirs of water should be contrived in the most convenient part of the ground, either in basins or narrow canals, and supplied with water from some contiguous spring, river, brook, pond, well, &c. See WATER.

The necessary space of ground proper for a family Kitchen-garden, may be from about a quarter of an acre, or less, to six or eight acres, or more, according to the appropriated limits of ground, the extent and demand of the family, and the expense the proprietor would chuse to bestow on the making and general culture. A Kitchen-garden of an acre will nearly employ one man, especially if it be furnished with wall and espalier trees to manage, and so in proportion to a garden of smaller or larger extent: a garden of the above size will produce a very plentiful supply of esculent herbage and fruit, sufficient at least for a family of ten or fifteen persons; but on large estates, and where the family is considerable in proportion, and not limited to space of ground, three or four acres of Kitchen-garden may be necessary; and some very large families have them of six or eight acres extent.

Fences for inclosing the Ground.

With respect to fences for inclosing the ground, it is most necessary to have an effectual fence of some sort around the Kitchen-garden, both for security of the produce, and to defend tender and early crops from cutting winds; and if wall-fences are used, they are also of the greatest utility for training wall-trees, for producing the more delicate kinds of fruit, and such as do not acquire perfection in this country without such aids.

Previous to fencing the ground, the proper shape or form for the garden is to be considered; the most eligible form for a Kitchen-garden is that either of a square, or oblong square; but the figure may be varied, according as that of the situation admits; keeping, however, as near as possible to the square or oblong form, especially if the ground is to be fenced with a wall for training fruit-trees; no other shape answers so well for that purpose; for trial having been made of circles, ovals, semi-circles, angles, &c. for wall trees, none succeed near so well as the square form, with the walls built entirely straight.

Different sorts of fences are used for inclosing this ground, as walls, paling, and hedges.

But where wall-trees are intended, the best sort of fence is a wall of brick or stone; but brick walls are considerably the best for training trees upon, for the joints of the brick-work being at short regular distances, afford frequent opportunities for nailing the branches; besides, the bricks themselves will also often admit of the nails being driven into them; so that against brick-walls we may readily train trees in the most regular manner; but in default of bricks, and where stone-walls are intended, the stones should be as regular as possible, and not too large, especially in the front of the walls, that the joints may be at small distances for the convenience of nailing, otherwise there will be an absolute necessity of having a treillage of wood-work erected against the walls for nailing the branches to. See TREILLAGE.

Sometimes, to save expenses in building brick or stone walls, boarded fences, or paling is used, both as fences, and for training fruit-trees upon. When such fences are intended for trees, the boarding should be tongued and closely joined, edge to edge, and so as to form a plane or even surface, for the commodious training the branches.

In gardens where no wall-trees are intended, a hedge, or bank and hedge, is a very proper fence, which may be so trained as to form both an effectual fence against men and beasts.

also to shelter particular parts of the ground for raising early crops; and a hawthorn hedge is the most proper ~~but~~, though other sorts may be used. See HEDGES.

No fencing, however, for a Kitchen-garden, where intended to have wall trees, is equal to brick or stone walls, which are considerably stronger, warmer, and more durable than paling fences; and their natural warmth, together with their reflection of the sun's heat, is the most effectual for the growth and ripening the more delicate kinds of fruit; but the brick walls are the warmest of all.

In either of these kind of inclosures or boundary fences of walling or paling for fruit-trees, it would be of important advantage, where there is scope of ground, to be so contrived as to have both sides occupied with trees; which is effected by having a slip of ground taken in all round the outside of the wall, or as far as may be convenient, about ten, twenty, or thirty feet wide, or more, inclosed outward with a bank and hedge (see HEDGES), or with any kind of paling, fencible against cattle, &c. which part, besides its utility in affording an opportunity of planting the outside of the wall, it will also be an addition to the Kitchen-ground, as it will serve for raising many sorts of Kitchen-esculents, and is often used as a sort of nursery, both for herbaceous and woody plants.

And in large gardens, where a great supply of wall-fruit is required, some cross-walls may be run along the garden, at an hundred feet or more asunder; but if more, the better; both sides of which may also be planted with trees, as observed of the boundary wall.

The proper height for the walls is from about eight to ten or twelve feet; but ten feet height will do tolerably well for most sorts of trees, provided you plant the trees at distance enough to have room to spread their branches horizontally each way; the walls, however, should never be less than eight feet high. See WALLS.

Hot-walls for forcing by fire-heat, &c. are often erected in large Kitchen-gardens; for an account of which, see FORCING-FRAME, HOT-WALLS, and WALLS.

Preparing and laying out the Ground.

The whole ground should be regularly trenched two spades deep; observing if the soil is poor, or of bad quality, and wants amendment, either of dung, or any of the materials before mentioned, respecting the soil, it must be previously added, and trenched in betwixt the bottom and top spits, so as

next year; when it comes to be digged again, the compost being well meliorated, will be worked up, and mixed with the natural soil. See DIGGING and TRENCHING.

Do not omit enriching and improving the borders for the wall and espalier-trees, by adding a considerable portion of rotten dung; and if the natural soil is not good, add also, if possible, some good loamy earth from the surface of a field or pasture-common, either to the whole, or rather than tail, a few barrow-fuls at first to each place where the trees are to stand; and improve the rest afterwards by degrees, at your convenience.

The ground must be divided into compartments for regularity and convenience. A border must be carried all round close to the boundary-walls, not less than four, but if six, eight, or ten feet wide, the better both for raising various early and other kitchen crops, and for the benefit of the wall-trees, that their roots may have full scope to run in search of nourishment, and by the annual digging and stirring the ground for the culture of the herbaceous esculents, greatly encourages the trees; hence the utility of having a broad border under the walls; next to this border a walk should be continued also all round the garden, of proper width, as mentioned below; then proceed to divide the interior parts into two, four, or more principal divisions and walks, if its extent be large; first, if the ground is of some considerable width, a straight walk should run directly through the middle of the garden; and another, if thought necessary, may be directed across the ground, intersecting the first; and if the garden extends any considerable length, two or more such cross walks may be necessary; the width of the walks may be from about five to ten or twelve feet, in proportion to the extent of the garden; and each of the quarters should be surrounded with a five or six feet wide border; and a range of espalier fruit trees may be planted along towards the back-part of each border, so that every quarter will be inclosed with an espalier; which will be ornamental in growth, and profitable in the annual production of superior fruit of different kinds.

I would not, however, by any means advise dividing small or moderate-sized gardens into too many walks and small quarters, especially if they are to be surrounded with espaliers, which would render them too confined for the proper growth of culinary herbage; besides it would be wasting too much of the ground in walks.

In one of the quarters a place should be allotted for the melon-ground; that is, a place for

for making the hot-beds for raising early cucumbers, melons, and other tender plants; fixing on a spot for this purpose, full to the sun from rising to setting, sheltered as much as possible from the northerly winds, and conveniently situated for bringing in the dung for the hot-beds.

This place, if not so situated as to be sheltered by the walls, or other fences of the garden, will be of much advantage to inclose it with a close fence, either a reed-hedge or paling; serving both to break off the winds, and by having a door to lock, will preserve your crops more secure; these fences may be six or seven feet high in the back or north side, with both the side fences sloping gradually to about five feet height in front; which should always be lowest to admit the sun freely.

With regard to the borders and walks of this garden, the outer borders adjoining the walks should be neatly formed, and the edges made firm and straight, and the walks gravelled, or laid with other dry materials.

The edges of the borders in small gardens are frequently planted with box, &c. especially in gardens where the Kitchen and pleasure-ground are all in one; sometimes part are edged with undershrubby aromatic herbs, as thyme, savory, hyssop, and the like; but unless these are kept low and neat, they appear unsightly; some, however, use no planted edgings at all in proper Kitchen-gardens, only have the edge of the border made up even, treading it firm that it may stand, then cut it straight by line; sometimes along the top of this edging is planted a row of strawberries, a foot or fifteen inches asunder; they will bear plentifully, and have a good effect; observing to string them several times in summer, to preserve them neat and within due compass. See FRAGARIA.

The walks should principally be laid with gravel, or good binding sand: or nothing better than road-stuff, i. e. the scrapings of turnpike-roads, shovelled up by the road-people, in moist weather, in heaps; which being the ballast or stones used in repairing the roads, ground to pieces by the carriages, &c. and after having lain some time to dry, then brought in, it will form exceeding good walks for the Kitchen-garden; or, for want of either of the above materials, may use coal-ashes, which, if the black colour can be dispensed with, will make a tolerably firm dry walk.

Sometimes grass-walks are used; but these are rather improper for general use in Kitchen-gardens, especially in such parts of the garden where wheel-barrows are obliged to come often, which would cut and greatly deface

them; besides, they are apt to be wet and disagreeable in all wet weather, and in winter; but if any are intended for variety and summer's walking, they should be only in some high dry part of the garden; and never let them be general; for, besides the afore-mentioned inconveniencies, they are apt to harbour slugs and other crawling vermin, to the detriment of the adjacent crops.

The wall-trees should be planted at from fifteen to twenty feet distance, according to the sorts. For peaches, nectarines, plums, and cherries, fifteen or eighteen feet is the proper distance; but for pears twenty feet is requisite: observing to plant the choicer and more delicate sorts in the best exposures, so as to have the most sun, as is expressed under their proper articles. Where practicable, always plant both sides of the wall; and if you would have the walls covered as soon as possible, if the walls are high, may plant first dwarfs as the principal furniture, then half standards and full standard wall-trees, alternately between the dwarfs; and whilst the dwarfs cover the lower part, the standards furnish the upper, but are to be afterwards taken away by degrees as the dwarfs grow up. See WALL-TREES.

The espaliers should be planted in one range round each main quarter, about four to five or six feet from the outer edge of the border, and from about fifteen to twenty feet asunder, according to the sorts of fruit-trees you plant. See ESPALIERS.

Within the espaliers in the quarters, you may plant some standard fruit-trees of the choicer sorts, at thirty or forty feet each way distant, especially large-growing standards, that they may not shade the ground.

Likewise in the quarters may be planted the small kinds of fruit-shrubs, as gooseberries, currants, and raspberries, in cross rows so as to divide the quarters into breaks of twenty or thirty feet wide, or more, others in a single range along near the outward edges, or some in continued plantations; placing the bushes nine feet asunder in each row; and if kept somewhat fan-spreading the way of the rows, they will not incumber the ground, and will bear very plentiful crops of large fruit. See their *Culture*.

In many places, however, as we formerly noticed, there is but a small compass of ground, or so limited as to be obliged to have the Kitchen, fruit, and pleasure-ground, all in one, or at least often all within the same general inclosure; in which cases, if any distinct part of the ground is required for ornament, a portion of it next the house may be laid out in a lawn or

grafs-plot, bounded with a shrubbery; beyond which, have the Kitchen-ground, separating it also from the other with shrubbery compartments: the Kitchen-garden may also be laid out with ornamental walks and borders, having a broad border all round next the walls: and next this, a walk from five or six to ten feet wide, carried all round the garden; and, if the ground is of some considerable width, may have one of similar dimensions extended directly through the middle; and next the walks, have a border of four or five to six or eight feet wide, carried round each quarter or principal division; which border, if raised a little sloping from the front to the back-part, will appear better than if quite flat; planting a range of espalier fruit-trees along towards the back edge of the border, so as immediately to surround the quarters, allotting the outside of the border for small esculents, or flowers, and small flowering shrubs, having the edge planted with box or thrift, or some with strawberries and other edging plants (see EDGING), and the walks neatly laid with gravel, or other materials before mentioned; the inside within the espaliers to be the Kitchen-ground, dividing it, if thought necessary, by rows of gooseberry, currant, and raspberry plants.

But when necessary to have the whole space of the Kitchen-garden employed for real use, no ground should be lost in ornamental borders and walks: have a border all round the boundary-fence, four or five feet wide, except the south borders, which should be seven or eight feet broad, because of their great use for raising early crops; and have a walk round the garden, not more than a yard to five or six feet wide; allowing the same width for the middle-walks, or so as to admit of wheelbarrows passing to bring in the manure, &c. and may either have a four-feet wide border all round each quarter, next the walks, or not, as you shall think proper; laying the walks neatly with any gravelly materials, dry road soil, or with coal-ashes, so as to have dry walking, and wheeling with a barrow in all weathers.

General Culture of the Ground.

With respect to the general culture of the Kitchen-garden,—it consists principally in a general annual digging; proper manuring; sowing and planting the crops properly; pricking out, planting, and transplanting various particular crops; keeping the ground clean from weeds; and watering the crops occasionally in summer.

As to digging,—a general digging must be performed annually in winter or spring, for the reception of the principal crops; also as often as any new crops are to be sown or plant-

ed at any season of the year; remarking, that, the general digging for the reception of the main crops of principal esculents in spring, I should advise to perform it always by trenching either one or two spades deep, besides the paring at top; though, except for some deep-rooting plants, as carrots, parsneps, &c. one good spade depth may be sufficient for common trenching, unless on particular occasions, to trench as deep as the good soil admits, to turn the exhausted earth to the bottom, and the fresh to the top to renew the soil. However, should be careful not to trench deeper than the proper fertile soil; and the trenching only one spade deep will much more effectually renew the soil than plain digging; and by paring the top of each trench, two or three inches deep into the bottom, all seeds of weeds on the surface are thereby buried so deep, that they cannot grow; and I should likewise advise that the general digging be performed principally in winter, or early in spring; but would be much the better if some considerable time before the season for putting in the crops, that the ground may have the advantage of fallow, to meliorate and enrich it; and always let the ground be trenched in rough ridges, that it may receive all possible benefit from the sun, air, rains, frost, &c. to fertilise and pulverise the soil, as it is soon levelled down for the reception of seeds and plants; and this levelling down will be an additional improvement, in breaking, dividing, and meliorating the earth. Plain digging, however, may be sufficient for most of the slight crops, especially in summer or autumn, after the ground has been trench-dug in the general winter or spring digging. See DIGGING and TRENCHING.

As to manure,—any kind of dung, or compost of dung and earth, is proper; and if this could be suited to the nature of the soil, it might be the greater advantage; that is, for ground of a strong, heavy, cold nature, have for manure, a compost of well-rotted dung, ashes, or any sandy earths; and if light sandy ground, have the moistest sort of dung, and heavy earths (see COMPOST, &c.) Though any kind of well-rotted dung will suit as proper manure for almost every soil, but none better than the dung of old hot-beds, which is the most common manure in Kitchen-gardens, being horse stable-dung, first used in hot-beds, where it becomes rotted to a soft, moist temperament, of an extremely enriching quality, and suits almost all kinds of soil and plants; or some of the same quality from dung-hills is equally eligible; but well-rotted neat's-dung is also very good, particularly for light-grounds; or

or a compost of different kinds, as horse-dung, neat's-dung, hog's-dung, farm-yard dung, or mulch, ashes, lime-rubbish broken small, saw-dust, rotten tan, having all lain together till well rotted, will make excellent compost manure. See COMPOST, DUNGS, &c.

The manuring, or dunging the ground, may be necessary every year or two; for all crops being of an exhausting nature in every soil, the vegetative vigour of the soils must be supported accordingly by a proper application of manure; but once every two or three years, at furthest, the ground in general will want amendment; though, where there is plenty of dung, give it as far as it will go every year, especially for the principal crops, such as onions, cauliflowers, cabbages, &c. for as the different crops exhaust the soil, the addition of dung fertilises and renews it; which when duly applied in proper quantities, the various crops will not only be much finer, but arrive to earlier perfection than in poor starved ground.

But for some particular crops, ground which has been well manured the year before, will be rather more eligible than immediate fresh dunging the same year, such as for some of the long fusiform-rooted kinds, as carrots and parsneps, &c. unless the dung is perfectly rotted, mellow and mouldry, that these long roots can readily make their way straight through in their perpendicular, downward growth; for when the dung manure is rank or lumpy, is more apt to impede the perpendicular-shooting radicle, and occasion the main root to fork or grow crooked, more especially the carrots, which also, in some fresh-dunged ground, are sometimes apt to canker.

All manuring should generally be performed in winter or spring, to be dug in at the general annual digging; taking opportunity of frosty or very dry weather to wheel in the dung for the principal manuring, as it may then be performed more easy and clean without clogging, or spoiling the walks, or tearing up the ground; laying it in heaps by barrow-fuls at equal distances; afterwards spread it evenly, and dig it in one spade deep, as directed under the articles DIGGING and DUNGS.

In regard to cropping the ground, the proper situation for, and method of raising the different plants is fully exhibited under their respective articles; we will therefore only hint here, that it is eligible to allot the driest, warmest, and most sunny situation for the early crops, and the other parts for the main crops.

The borders under the south walls are proper for raising the earliest plants, as early peas, beans, radishes, spinach, lettuce, carrots, small salad herbs, kidney-beans, &c. the east and west borders for succession of early crops; and the north borders, which being shady and cool, serve for raising and pricking out many small plants, slips, and cuttings in summer; though all these borders in every exposure may be made useful at all seasons. The borders next the espaliers are proper for crops of small plants at all seasons of the year, as lettuce, endive, spinach, small-salad herbs, strawberries, and several others, both to stand, and for transplantation, according to the mode of culture of the different sorts; and by keeping all the borders constantly well furnished with various esculents, disposed according to their different growths, they, besides their usefulness, effect a delightful variety.

The borders, however, under the walls are by some authors strictly prohibited from the growth of culinary plants, on a supposition of their robbing the trees of nourishment; but as the south borders being so valuable for raising many early crops, such as radishes, lettuces, spinach, small-salad herbs, carrots, peas, beans, kidney-beans, &c. they should not be lost; in short all the other borders will be extremely useful in their turn; and when the borders are properly manured every year or two, I never found any material inconvenience arise to the trees. Peas and beans are particularly forbid to be grown on these borders: it is probable they might be better without them; but if only the lower-growing sorts are cultivated, and these in wide rows, and not too close to the trees, there will be no danger of their being injured by the crops, especially, as above hinted, if care is taken to recruit the soil occasionally with rotten dung.

In the internal parts, called the quarters, should always be raised the larger principal crops, such as cabbages, cauliflowers, broccoli, coleworts, peas, beans, kidney-beans, onions, leeks, carrots, parsneps, beet, potatoes, turneps, artichokes, celery, general crops of lettuces, spinach, horse-radish, &c.

As many of the esculent plants succeed best in rows, such as peas, beans, cauliflowers, and all the cabbage kinds, transplanted lettuces, endive, potatoes, artichokes, Jerusalem artichokes, celery, and some others, particular regard is requisite, that the rows are at a proper distance for the plants to have full scope to grow, as directed for each sort under their proper heads; and would advise that all the tall-growing sorts, close sown in drills, as peas, beans, kidney-beans, &c. for early crops, have their

rows ranging south and north, if possible, that the sun may shine on each side of the rows more effectually, as well as on the ground between the rows, both of which are of more advantage to early crops than may be generally imagined; for when the rows range east and west, one row shades another, so that when the plants grow up, they cannot all receive an equal benefit of the sun.

The great art in cropping a Kitchen-garden is to make the most of every part of the ground, where necessary, by having every part well occupied, and as many crops annually as possible, as practised by the experienced market-gardeners and others, who have occasion to cultivate the whole Kitchen-ground to every possible advantage; often having two or three different crops advancing in successive order together on the same compartment, especially where the principal crop is in wide rows, as in cauliflowers, cabbages, beans, &c. other kinds are frequently inter-cropped, at a proper period, or of peculiar growth in the respective sorts, not to impede each other or the principal crops above intimated; either sometimes light crops of quick growth to come off soon, or by the time the others begin to advance considerably; or sometimes, in the advanced state of the main crops, they are inter-cropped with others of a more continuing and larger growth to be coming forward, ready, as the others are going off, fully occupying the same ground in a succession crop in some advanced growth, whereby both time and ground are occasionally gained; though, where there is a plentiful scope of Kitchen-ground, especially in private gardens, any considerable inter-cropping would be unnecessary, as generally each sort raised separately, will, in some degree, be superior: however, on the other hand, as in many places the Kitchen-ground is much limited, it is incumbent on the occupier or cultivator to contrive to inter-crop occasionally in various crops agreeably to the above intimations, and which is most generally hinted in the culture of the respective sorts under their proper genera.

With regard to the methods of sowing and planting the different crops,—some are sown in drills, but the greater part by broad-cast on the surface, and the seeds most generally raked in, or the earth spread over them; and as to planting out the different plants, it is most commonly done by dibble, and some sorts in dills or trenches, as practised for asparagus; see DRILL-SOWING, SOWING SEED, PLANTING, TRANSPLANTING, DIBBLE, HOE, &c.

Destroying weeds is a most necessary culture in the Kitchen-garden, and which must be very particularly attended to in spring and summer, for the success of the crops greatly depends upon that work; it may be performed both by hand and hoe, occasionally; hand-weeding is proper for all close-growing small plants, that either do not require thinning at all, or are only to be thinned by degrees; but by hoeing, in many cases where the plants stand wide in rows, the broad hoe must be applied, both as the most expeditious method of killing the weeds, and the most effectual for the benefit of the plants, by stirring the earth about them; likewise small hoeing is effectual for many small plants that require thinning, and are designed to be thinned either in part, or hoed out at once to their due distances, such as onions, carrots, parsneps, beet, turneps, &c. (see HOEING); observing in either mode of destroying weeds, always proceed to it time enough before the weeds begin to spread much, or are above an inch high; then the work may be performed with ease and expedition, and to the greater benefit of the crops, by having the weeds timely destroyed; always chusing dry weather for destroying weeds by hoe; and in hoeing between plants in rows, such as peas, beans, kidney-beans, cabbages, cauliflowers, &c. always in the first and second hoeing draw a little earth up about their stems; which will greatly strengthen the plants, and forward their growth.

The utmost attention is necessary never to suffer weeds to stand to perfect their seeds in any part, whether in crop or vacant, or on dung-hills, or compost heaps, as they would lay the foundation of several years' trouble to extirpate them; for as, in digging or hoeing the ground, some of the seeds would be buried near the surface, others much deeper, at every time of stirring the earth a fresh crop of weeds would arise from the same seeds; which verifies the saying, "One year's seedling makes seven years' weeding."

When weeds, however, are unavoidably suffered to grow large, or greatly advanced towards seeding, and are pulled up, or hoed down, let them, if possible, be carried off the ground, as many sorts will often flower and perfect their seeds as they lie, particularly the downy-seeded kinds, as dandelion, groundsel, &c.

And with respect to root-weeds, i. e. those with perennial roots, such as bear-bind, couch-grass, &c. the roots of which, and all others particularly of the like creeping growth, should be carefully picked out, at every time of

of digging the ground; for the least bit will grow and greatly increase; and in spring or in summer, as often as they shoot above ground, should be pulled up, or, where the hoe can come, deeply hoed; which, if often repeated in dry weather, will greatly diminish them.

Watering the Kitchen-garden is only necessary in warm dry weather, to particular plants, more especially to all those newly transplanted; this in particular should never be omitted, where practicable; for by giving each new-set plant directly some water, it settles the earth close about their roots, they sooner set to growing freely, and establish themselves firmly; and in hot dry weather, the watering should be repeated every day or two for a week, till the plants have taken new root, and set to growing afresh. Watering is also often requisite in dry weather in the latter part of spring and during the summer season, to beds of new-sown small seeds; also after they come up, if the dry hot weather continues. Some sorts of plants require continued occasional waterings throughout the spring and summer seasons, such as all plants in hot-beds, as cucumbers, &c. as directed under the respective articles. In performing the watering, that for new transplanted plants placed singly in wide rows, is commonly performed with the rose or head of the watering-pot off, giving it only just about each plant; though, in closer crops, if all the ground is occasionally watered, it will be the more beneficial to the plants. However, where the plants stand close, either transplanted, or seedlings in the seed-bed, the watering should be performed with the head of the pot on, giving it all over the plants, ground and all; observing in watering beds of small seeds, or small seedling plants, not to water too heavy or hastily, lest it wash the seeds or plants out of the ground.

All general watering in summer, in hot sunny weather, should be performed principally in a morning or afternoon, that the moisture may have time to soak to the roots of the plants before it is exhaled by the sun's heat.

Neatness should also be observed in the Kitchen-garden as well as in the pleasure-ground, though not with that elegance as necessary in the latter; only a common useful neatness; for a well-kept Kitchen-garden is to many as agreeable to walk in as the finest flower-garden; keep, therefore, all the walks particularly, and the principal outward borders, clean from weeds, and all manner of rubbish, not suffering the decayed useless stalks

and leaves of plants to remain; the same should also be observed of the quarters or internal divisions, clearing off all decayed cabbage-leaves, decayed peas and bean-stalks, broken or withered artichoke-leaves, and other large rubbishy matter: for, besides their littering appearance, some sorts, such as the decayed leaves of all the cabbage kinds, artichokes, &c. are apt to emit disagreeable smells, and harbour slugs and other crawling vermin; so should always be cleared off, especially in gardens where company often walk.

And as crops are cleared off the ground, always broad-hoe it to cut up all the weeds; and if the weeds are large, it is proper to rake them off, especially if it is like to be wet weather; but if dry and sunny, they will soon die; though where large and rubbishy, you should fork off the grosser part, clear away.

In autumn and winter, as the ground becomes vacant from crops, manure such as requires it, and trench the ground up in ridges, previous to spring cropping; for it greatly improves all ground to lie thus exposed to the weather some months before it is sown or planted.

Kitchen-garden Plants.

KITCHEN-GARDEN PLANTS. Having given directions above for the making and general culture of the Kitchen-garden, a list of the principal plants necessary to furnish such gardens, will, we presume, be proper in this place; which notwithstanding their being all fully treated of under their respective genera, yet by collecting them into one point of view, with short hints of their method of propagation, will greatly assist the memory of every one, in furnishing his garden at the proper season.

We will exhibit each sort under its generic botanical name, viz.

AGARICUS *campestris*.—Field agaric, or mushroom. Propagation by spawn of the root, or invisible seed, running in lumps of earth or dung. Autumn the proper season.

ALLIUM, garlick, onion, leek, &c. The sorts are:

ALLIUM *sativum*, manured garlick, of which there are—large white garlick—red garlick. Propagation by the cloves of the root.

ALLIUM *Scevaloprasum*, rocambole. Propagation by the root and bulbs from the stalk.

ALLIUM *Cepa*, the onion—common oval Strasbourg onion—great oval Portugal onion—flat white Spanish onion—flat red Spanish onion—silver-skinned onion—bulblefs-rooted Welch onion. Propagation of all by seed annually.

ALLIUM

ALLIUM Schœnopræsum, chives, or cives. By dividing the roots.

ALLIUM Ascalonium, escalot, or shallot. By off-sets of the root.

ALLIUM Cœpea canadense. Canada tree-onion. Propagation by off-set bulbs of the root, and the bulbs at top of the stalk.

ALLIUM Porrum, the leek—broad-leaved London leek—narrow-leaved leek. By seed annually.

ANETHUM, dill, &c. consisting of the following species:

ANETHUM graveolens, common dill. By seed annually.

ANETHUM Fœniculum, fennel—light-green-leaved—dark-green fennel—sweet seeded fennel. By seed, also by slipping the old roots.

ANETHUM finocœlia, or Italian fennel. By seed annually.

ANGELICA fatica, or *archangelica*—common Angelica. By seed annually.

APIUM, parsley, celery, &c. consisting of the following sorts:

APIUM Petroselinum, parsley—common plane-leaved parsley—curled-leaved common parsley—broad-leaved, or large-rooted parsley; the two former for their leaves, and the latter for its root. All raised by seed in spring.

APIUM dulce, celery—common upright celery—upright celery with solid stalks—turnep-rooted spreading celery—All by seed in the spring, for transplanting in summer and autumn.

ASPARAGUS officinalis, common asparagus. By seed: and once raised, the roots abide for years.

ATRIplex hortensis. Garden orach—white-leaved garden orach—green orach—purple orach. By seed annually.

BETA vulgaris. The beet, of which there are:

BETA Cicla, common culinary beet—green-leaved culinary beet—white beet—chard, or great white Swiss beet—mangel wurzel beet. All by seed annually.

BETA rubra, red beet—large, long, red-rooted beet—turnep-rooted red beet—red-rooted beet, with green leaves—pale-red beet; but those with dark-red leaves and roots are the only sorts for use. By seed annually.

BORAGO, borage. Some varieties. All raised by seed annually in autumn or spring.

BRASSICA, the cabbage, cauliflower, broccoli, turnep, &c. The sorts are:

BRASSICA oleracea, the cabbage, of which there are:—small early summer cabbage—dwarf early sugar-loaf-shaped cabbage—large, hollow, sugar-loaf cabbage—early

Russia cabbage—common round white cabbage—long-sided hollow cabbage—oval hollow cabbage—flat-topped cabbage—musk-scented cabbage—giant cabbage—red cabbage. All by seed annually in spring and autumn, for use all the year.

BRASSICA fabauda, favoy cabbage—common green curled favoy—large green Dutch favoy—yellow favoy. By seed annually in spring, for autumn and winter use.

BRASSICA laciniata, laciniated, and other open-leaved cole—green curled borecole—red curled borecole—thick-leaved curled borecole—finely fringed borecole—broad, erect, curled-leaved Siberian borecole, or Scotch cole, or kale, red and green—common plane-leaved green colewort; none of these ever cabbage, but always remain open and loose quite to the heart; are remarkably hardy, and proper for winter use. All raised by seed annually in spring and summer.

BRASSICA Napo-brassica, turnep-cabbage—turnep-cabbage, with the turnep above ground—with the turnep under ground. By seed.

BRASSICA Cauliflora, the cauliflower.—early cauliflower—late cauliflower. By seed annually in spring and autumn.

BRASSICA italica, Italian *brassica*, or broccoli—early purple broccoli—late large purple broccoli, comprehending some varieties, with blue, brown, green, and yellowish heads—dwarf purple broccoli—white, or cauliflower-broccoli—black broccoli. All by seed in spring and beginning of summer, for autumn, winter, and spring use.

BRASSICA Rapa, the turnep—early Dutch turnep—white round turnep—green-topped turnep—red-topped turnep—yellow turnep—oblong white turnep—long white-rooted French turnep—round purple French turnep. By seed in spring and summer, for use most part of the year.

CALENDULA officinalis, common officinal marigold, several varieties. By seed annually in spring, summer, or autumn.

CICHORIUM Endivia, endive—green curled endive—white curled endive—broad-leaved Batavian endive. By seed annually in summer, from May till July, for autumn and winter service.

COCHLEARIA armeraca, horse-radish. By pieces of the roots in spring, for use most part of the year.

CRAMBE, sea-colewort. By seed in spring; but once raised, the roots remain for years, sending up shoots for use in spring and summer.

CUCUMIS, the cucumber and melon. The sorts are:

CUCUMIS

CUCUMIS sativa, the cucumber—early short prickly cucumber—early cluster-cucumber—long, green, prickly cucumber—long, white, prickly cucumber—long, smooth, green, Turkey cucumber—large, smooth, white cucumber—large, smooth, green, Roman cucumber. All by seed annually in spring and summer.

CUCUMIS Melo, the melon—Romana melon—Cantaleupe melon; of each some varieties; and several other sorts; see their *Culture*. By seed annually in spring.

CUCURBITA, the gourd and water melon, of each different sorts; see *CUCURBITA*. By seed annually in spring.

CYNARA, artichoke and cardoon. The sorts are:

CYNARA Scolymus, common artichoke, of which are—globular-headed, red Dutch artichoke—oval-headed, green French artichoke. By suckers from the sides of the old plants in spring—of many years' duration.

CYNARA Cardunculus, the cardoon. By seed annually in spring.

DAUCUS Carota, the carrot—orange-coloured carrot—red carrot—yellow carrot—white carrot. By seed annually in spring, summer, and autumn, for use most part of the year.

HELIANTHUS tuberosus, tuberous sunflower, or Jerusalem artichoke. By pieces of the root annually in spring.

HYSSOPUS officinalis, common officinal hyssop. By seed in spring, and by slips and cuttings of its branches.

LACTUCA, lettuce—early green cabbage-lettuce—white cabbage-lettuce—brown Dutch cabbage-lettuce—great admirable cabbage-lettuce—green and white ball-cabbage-lettuce—green cos-lettuce—white cos-lettuce—black cos-lettuce—spotted Aleppo cos-lettuce—brown Celicia lettuce—imperial lettuce—red capuchin lettuce—green capuchin lettuce—curled lettuce. All by seed annually in spring, summer and autumn, for use most part of the year.

LAVANDULA, lavender. The sorts are,

LAVANDULA spica, spike-flowered common lavender—common narrow-leaved—broad-leaved—blue-flowered—white-flowered—and dwarf lavender. By slips in spring—of many years' continuance.

LAVANDULA Stachas, stachas or French lavender. By slips or cuttings, and by seed—of many years' duration.

LEPIDIUM sativum, garden-cress—common small-leaved—broad-leaved—curled-leaved. By seed at different times of the year, according as the plants are wanted.

MELISSA officinalis, balm. By dividing the roots in spring or autumn—many years' duration.

MENTHA, mint, penny-royal, &c. viz.

MENTHA viridis, green common spear-mint—curled-leaved spear-mint—variegated spear-mint. By dividing the roots, by young plants, and by cuttings of the stalks in spring—and continue many years.

MENTHA piperita, pepper-mint. By roots and plants, &c. like the former.

MENTHA Pulegium, penny-royal. By dividing and slipping the plants, as for the mint.

OCYUM Basilicum, basil. Several varieties, see *OCYUM*. By seed in spring.

ORIGANUM, marjoram—common, wild, perennial pot marjoram—winter perennial sweet-marjoram—marjorana, or annual sweet-marjoram. By seeds in spring, and the two former also by slipping the roots.

PASTINACA sativa, parsnep. By seed annually in spring, for winter use.

PHASEOLUS vulgaris, common kidney-bean, which may be divided into two classes,—dwarfs and runners.

————— *Dwarfs*, are—early white—early yellow—liver-coloured—speckled dwarf—Canterbury white dwarf—Battersea white dwarf—large white dwarf—cream-coloured dwarf—black dwarf—sparrow-egg dwarf—amber-speckled dwarf. All by seed annually at different times from April till August.

————— *Running kinds*—scarlet runner, and white variety—large Dutch runner—Battersea white runner—Negro runner—variable runner. By seed like the former.

PISUM, the pea—Charlton pea—golden Charlton—earliest golden Charlton—long Reading hotspur—Masters' hotspur—Spanish morotto—green nonpareil—early dwarf marrowfat—large marrowfat—green rouncival, or union—white rouncival—Ledman's dwarf pea—small sugar pea—large sugar-pea—cluster-pea—crown-pea—egg-pea—sickle pea, &c. All by seed annually, at different times from October till June.

PORTULACA oleracea, purslane—green purslane—golden purslane. Both sorts by seed, in April and May.

POTERIUM Sanguisorba, burnet. By seed and parting the roots.

RAPHANUS sativus, the radish—short-topped early radish—long-topped radish—deep-red radish—pale-red, transparent, mild radish—salmon-coloured radish—small white turnep-rooted radish—small red turnep radish—large, white, turnep-rooted Spanish radish—large, black, turnep-rooted Spanish radish.

All

All the sorts by seed at different times from Christmas till July or August; but the latter sown principally in June and July, for autumn and winter use.

ROSMARINUS, rosemary, some varieties. By layers, slips, and cuttings, in spring.

RUMEX *Acetosa*, sorrel—common long-leaved sorrel—round-leaved French sorrel—barren sorrel. By parting the roots, and the first sort also plentifully by seed.

RUTA *graveolens*, rue; several varieties. All by slips and cuttings.—Also by seed.

SALVIA, sage, clary, &c. The sorts are:

SALVIA *officinalis*, common sage—red sage—broad-leaved green sage—narrow-leaved green sage—broad-leaved hoary sage—sage of virtue—wormwood sage, &c. By slips in April, May, and June.

SALVIA *Sclarea*, clary. By seed annually.

SATUREJA, savory—winter perennial savory—summer annual savory. Both by seed, and the former also by slips.

SCANDIX *Cerifolium*, chervil. By seed annually in August, for winter and spring use, or sown also in spring and summer, for succession.

SCORZONERA, *scorzonera*, an eatable root, raised from seed in spring.

SINAPIS, mustard—white mustard—black mustard—field or wild mustard: the former to use young in salad, and the two last for their seeds, to make the table sauce called mustard. All by seed in spring, or if for salads, at any time of the year.

Sium *Sisarum*, skirret; an eatable root. By off-sets commonly, of the root, also by seeds.

SMYRNIUM *Olusatrum*, Alifanders, or Alexanders. By seed annually in spring.

SOLANUM, night-shade, furnishes the potatoe and tomatoe. The sorts are:

SOLANUM *tuberosum*, tuberous-rooted solanum, or potatoe—common round red potatoe—early round red—oblong red—deep-red

—pale-red—rough red—white kidney-shaped—large red-ended kidney—white round—white cluster—prolific American. By pieces of the roots, or the roots whole, in spring. Also by seed occasionally to obtain new varieties.

SOLANUM *Lycopersicum*, tomatoe, or love-apple; some varieties. All by seed annually.

SPINACIA, spinach—round thick-leaved—or smooth-seeded—triangular-leaved, or prickly-seeded; the former for spring and summer crops, the latter to stand the winter. Both by seed annually in spring, summer and autumn, for use most part of the year.

TANACETUM *vulgare*, common tansey. By parting the roots in spring or autumn.

THYMUS *vulgaris*, common thyme; having some varieties. By seeds in March and April; also by slips of the root and branches, and by cuttings; but seed is the only way to raise a quantity of the common sort; and the other methods to continue the varieties, or for any general supply, as may be required.

TRAGOPOGON *porrifolium*, falfafy, an esculent root. By seeds annually in spring.

TROPEOLUM, Indian cress, or nasturtium—nasturtium minus—nasturtium majus; their flowers for garnish and salads, and their seeds to pickle. Raised annually from seeds in spring.

VALERIANA *Locusta*, corn-salad, or lamb's-lettuce. By seed in spring and autumn.

VICIA *Faba*, the bean—early Mazagan—early Lisbon—long-pod—Turkey long-pod—toker bean—Sandwich bean—Windsor bean—white-blossomed—red-blossomed—Spanish bean—nonpareil bean—dwarf fan bean, very low. All of them by seed annually, at different times from October until June.

For a particular description, and method of culture of all these Kitchen garden plants, see each under its respective genus as above

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LABIATUS *Flos*, a lip-flower; a monopetalous irregular flower, divided into two principal divisions, resembling two lips.

Labiated or Lip-flowers make part of the ringent or grinning tribe (see **COROLLA RINGENS**); and of which are most of the verticillate plants, as balm, mint, hyssop, sage, clary, marjoram, savory, lavender, thyme, and many others, most of which produce their flowers in a verticillus, or whorl round the stalks and branches. See **VERTICILLUS**.

LABYRINTH, a maze or sort of wilderness-plantation, abounding with hedges and walks, distributed into many winding and intricate turnings, leading to one common centre, extremely difficult to find out; designed in large gardens by way of amusement.

A Labyrinth is formed with hedges, commonly in double rows, leading in various intricate turnings, backward and forward, with intervening plantations and gravel walks alternately between hedge and hedge; and the great aim is to have the walk contrived in so many mazy, intricate windings to and fro, that a person may have much labour and difficulty to find out the centre of the Labyrinth, by meeting with as many stops and disappointments as possible; for he must not cross or break through the hedges; so that in a well-contrived Labyrinth a stranger will often entirely lose himself, so as neither to find his way to the centre, nor out again the way he came in.

These Labyrinths are rarely introduced now in our modern garden designs; and scarce to be seen, but in some old noble gardens.

As to the plan of them, it is impossible to express it with any propriety by words, no farther than the above hints; but there are different plans, and the contrivance of them must depend on the ingenuity of the designer.

But as to their hedges, walks, and trees; the hedges are usually of hornbeam, but may also be of beech and elm, or any other that can be kept neat by clipping (see **HEDGES**). The walks should be five feet wide at least, laid with gravel and neatly rolled; and the trees and shrubs to form a thicket of wood between the hedges may be any of the hardy

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kinds of the deciduous tribe, interspersed, if you please, with some ever-greens; and in the middle of the Labyrinth should be a spacious open for the centre.

Sometimes small Labyrinths are formed with box-edgings, and borders for plants, and alleys for walking, in imitation of the large ones, and which have a good effect in small gardens.

LACHENALIA a genus of bulbous-rooted exotics for the green-house.

Class and order, *Hexandria Monogynia*.

Characters.] **CALYX**, none. **COROLLA**, six erect petals, joining at their base, and unequal; the three outward ones shorter. **STAMINA**, six subulate filaments, joined to the base of the petals, and topped with oblong antheræ. **PISTILLUM**, an oval germen with a subulate style, crowned with a single stigma. **PERICARPIUM**, an oval three-winged capsule with three cells, containing many globose seeds.

There are several species of this genus; the most material are the two following:

1. **LACHENALIA orchicoides**.

Spotted-leaved Lachenalia.] Lachenalia with lanceolate spotted leaves, shorter than the flower-stem, and bell-shaped corollas growing in a spike.

2. **LACHENALIA tricolor**.

Three-coloured Lachenalia.] Lachenalia with a round bulbous root, oblong, spear-shaped leaves, and cylindraceous flowers, the three interior petals doubly longer than the three exterior; they terminate in an upright spike seven or eight inches high, and grow on short foot-stalks nodding downwards. This plant receives its name *tricolor* from three colours in each flower, the base being red, the middle green, and the extremities of the petals yellow.

These plants require to be sheltered in the green-house during the winter, they flower in the spring, and the bloom may be forwarded by being placed in the stove. The propagation is by off-sets from the bulbs when the plant is at rest.

LACTESCENTIA, milkiness. Lactescent plants are such as abound with a milky juice,

such as lettuce (*lactuca*), dandelion, and many others.

The colour of the juice in question is white in most plants, though in some it is yellow, in others red; most Lactescent plants are said to be poisonous, except those with compound flowers, which are of an innocent quality.

Among the poisonous sorts may be reckoned, *euphorbium*, fumach, celandine, cassida, cardinal-flower, swallow-wort, apocynum, &c.

Among those innocent in their quality, are all the sorts of the *lactuca sativa*, or cultivated lettuce, falfasy, dandelion, &c.

LACTUCA, Lettuce.

One species only of this genus furnishes all our valuable varieties of Lettuce; all of which are herbaceous annuals of great estimation for sallads, and many culinary purposes; are in greatest perfection in summer, but may be continued most part of the year; though being rather impatient of severe frost, cannot be obtained in any tolerable perfection in winter, unless planted under shelter of frames, &c. Their cabbaged inner leaves are the useful parts, which having obtained perfection, the plants soon after shoot up tall branchy stalks, terminated by compound yellowish flowers.

Class and order, *Syngenesia Polygamia Æqualis*.

Characters.] CALYX, a compound flower, having a scaly imbricated general cup. COROLLA, many tongue-shaped hermaphrodite flowers, placed imbricatum. STAMINA, five short filaments, and cylindric antheræ. PISTILLUM, an oval germen, slender style, and two reflexed stigmas. PERICARPIUM, none. SEMINA, a single compressed seed to each floret, crowned with a simple down, sitting on the receptacle.

The cultivated species of Lettuce is,

LACTUCA sativa.

Cultivated Lactuca, or Common Lettuce.]

Hath a long taper root, crowned by many large roundish, or oblong-oval, close-fitting leaves, in some spreading, others erect, the inner ones contracting gradually, and form a close, firm, cabbaged head; and from the centre of which rises the flower-stalk, branching two or three feet high, having all the branches terminated by small compound yellow flowers, succeeded by small, flat, mostly white seeds, and some sorts black, and ripening in autumn.

The varieties of this species are very numerous; but the real valuable sorts now commonly cultivated, do not amount to above six or seven; and it is better to cultivate only a

few of the known good kinds, than to confuse the ground with a great multiplicity of sorts, unless required merely for variety. We will, however, exhibit a list of the principal, and less material varieties separate.

Principal Varieties.] Hardy green cabbage-lettuce—white cabbage-lettuce—honey cabbage-lettuce—great, admirable, white cabbage-lettuce—brown Dutch cabbage-lettuce—green cos lettuce—white cos lettuce—brown Cilicia lettuce—green Cilicia lettuce. All the cabbage kinds are of spreading growth, but cabbage firmly; and the other sorts grow upright, and also cabbage very large.

All these seven varieties are excellent Lettuces for general culture, though the green and the white cos kinds are in most esteem for the general summer crops; and the green cos rather excels all the cos kinds for size and goodness; but as all the above varieties both of the cabbage and cos kinds cabbage exceeding fine, a few of each is worth culture in every garden for general use; but rather most of the cos kinds for summer, and most of the others for autumn and winter; and the hardy cabbage, brown Dutch, and the white and green cos, are proper also to stand the winter for spring service; but if thought proper, some of each sort may be used for either or all of these seasons, except the great admirable cabbage-lettuce, which being rather tender, or at least, does not succeed for early nor late crops, so should be sown principally in April and May, and will cabbage remarkably fine in July and August. All the other varieties, however, may be sown any time in spring, summer, and autumn. See their *Propagation*, &c.

Less material Varieties.] Small, early, green ball-cabbage Lettuce—white ball-cabbage Lettuce; both these are varieties of the common green and white cabbage-lettuce—green capuchin Lettuce—red capuchin Lettuce—large imperial Lettuce—spotted cos lettuce—black cos lettuce, large and somewhat spreading above. All these varieties cabbage to firm heads; though inferior to the former class of varieties for general use; but their culture is all the same as the others; and, if required for variety, may be raised abundantly by seed in spring, summer, and autumn. See their *Propagation*.

All the above varieties of Lettuce in each class are tolerably permanent, especially if care is taken to save seeds only from some best plants of each sort; and the different sorts standing as far distant from each other as possible, that their *farina* may not mix and cause a degeneracy; for it is by not strictly observing

this,

this, that so many are disappointed in their crops, by having Lettuce not of the approved sorts, and those often small and insignificant, running to seed before they have half cabbaged; therefore great regard should be had in the choice of the plants for seed, according to the above hints, and as directed under the head of *saving the seed*, by which you may depend on continuing plants of the approved kinds in the utmost perfection.

The plants in general may be considered both as annuals and biennials; for those sown in spring and summer, attain perfection, run up to seed, and perish the same year; but the autumn sowings will stand all winter until spring following, when they attain perfection, then shoot up for seed, and perish root and all.

All the sorts are hardy enough to grow in any common soil of a kitchen-garden, in a free situation open to the sun and air; but being rather impatient of severe frost and wet soils in winter, should have a dry warm situation in that season, and some should be planted under frames and other shelters, in October or November, the more effectually to preserve, and forward them for use during the winter and spring.

Their use is principally for fallads, when arrived to full growth and cabbaged, that the inner leaves become blanched, crisp, and sweet, otherwise would eat tough and bitter tasted; but sometimes also the young open plants of the cabbage Lettuces are used in winter and spring, till the other general crops arrive to perfection: and, in the same case, when necessitated to use small Lettuce, spring raised, in young open growth, the white cabbage kinds are the most eligible to sow for this occasion, as they generally eat sweeter than any other sorts while young and open. Quite young open Lettuces are also often used as small salad herbs, sowing them thick in rows, like cresses, &c. and gather them for use in the same manner as those plants; but this mode of culture is more particularly practised in winter and spring. Lettuces, however, in general eat no way so crisp, sweet, and palatable, as when fully cabbaged; and are themselves sufficient for a salad, if thought proper, without the addition of other herbs. The fully cabbaged Lettuces are also excellent for stewing and for soups, and other culinary uses.

The season of Lettuces may be continued most part of the year, by different sowings; but their principal season of greatest perfection is June, July, and August, in which months the spring-sown plants arrive to a

large size, and finely cabbaged. However, by several different sowings in spring, summer, and autumn, they may be had cabbaged more or less almost the year round: the spring sowings furnish the main summer crops, the summer sowings for autumn use; and the late autumnal sowings stand the winter, and some of which will be fit for use in that season, and if occasionally sheltered, some will be tolerably cabbaged, and others arrive to perfection in spring and beginning of summer, before the spring-sown plants come in.

Propagation, and Season for sowing all the Sorts.

The propagation of all the sorts of Lettuce is by seed annually, and, in order to continue a regular succession of them for use at all times of the year, several different sowings, from February to October, are necessary; but the principal sowing-season for the main crops is spring, in February, March, April, and May; which will furnish a constant supply of good Lettuces from May till August or September; and by latter sowings they are continued longer accordingly: as the plants, however, of all the sowings, after having attained their proper size, and fully cabbaged, they soon after run up to seed, so that to insure a continued succession as long as possible, a sowing may be performed every three weeks or month, from January until September or October. The spring and summer sowings furnish Lettuce for use, in young, middling, or full growth, from April or May until November; and the autumn sowings in August, September, and October, come in for use late in autumn, and in winter; and for early spring Lettuces, as before observed, in warm borders, under walls, and in frames, hand-glasses, and other shelter; observing that all the sorts succeed either by remaining where sown, thinning them to proper distances; or by transplantation, placing them a foot at least asunder; but it is proper always to transplant a principal quantity of each sowing, both to thin the standing plants properly, and to obtain a longer succession of each crop; for the transplanted Lettuces will succeed the standing plants for use, and often grow larger, and generally remain longer in perfection before they run.

The main crops of Lettuces should generally be sown distinct from other crops, and each different variety separate; they, however, are very commonly sown thin among some other low crops, to save ground; some of the plants designed for transplantation into other places, and some to remain at good distances for cabbaging; so are frequently sown

among early radishes and spinach, also among onions, leeks, carrots, parsneps, &c. particularly the upright sorts of cos Lettuces; any of the sorts are likewise often sown thin among winter spinach, but chiefly the common green cabbage, and brown Dutch kinds; but in sowing any sorts of Lettuces among any of these crops, a thin sprinkling should only be admitted; but when there is plenty of ground, I should be for sowing the main crops principally distinct by themselves, and the plants thinned out, leaving some to remain for cabbageing where sown, and transplant the rest into another spot of ground as hereafter directed.

Observe, as before noticed, that when intended to have early young open Lettuces for spring use, the white cabbage kinds are the proper sorts to sow for that purpose, and may begin to thin the young plants for use, when their leaves are an inch or two broad; which may be continued as they are wanted, leaving some at regular distances to arrive at full growth.

But, for full-grown Lettuces, it is proper to sow the different sorts both of the principal cabbage and cos kinds at the same time in separate spots of ground, and each moderately thin; whereby you will have a regular supply of each sort, only observing at each sowing to sow most of those sorts that are in the greatest request either for family use or market; remarking the sorts, as before directed, that are the most proper for use at the different seasons of the year, and the different times of sowing as above mentioned.

The early sowings of all the sorts should be performed on a warm border, or some dry sheltered situation, to have the crops as forward as possible; and if required to have a few early Lettuces as forward as can be, they may be greatly forwarded by sowing in a slender hot-bed in January or February; particularly the white and green cos Lettuce; and if the young plants of an inch or two high are pricked out into another slight hot-bed, it will still bring them more forward; and after having a month's growth, some may be thinned out in mild weather, and planted a foot distance in the open ground; but in default of hot-beds, a few may be sown in frames, or under hand-glasses in a bed or border of natural earth, to have shelter on nights and cold weather, which may bring them a little forwarder than those fully exposed. The sowing, however, in a hot-bed, or under frames, &c. is more particularly necessary after a severe winter, when the autumn-sown crops of Lettuces designed for spring use are cut off;

but in mild winters, when a plentiful supply of the autumn Lettuces have survived the winter, there will be little occasion for any other precaution than to sow the earliest spring sowings on warm borders, &c. as aforesaid.

But the general spring and summer sowings for the main crops, for summer and autumn use, should be performed principally in any open situation, in the quarters, or large open borders; the more distant from spreading trees and bushes, the better; the same should also be observed in the transplanted Lettuces, for when under or too near shady places, they always draw up weak, never cabbage large, and soon fly up to seed; whereas those in a free exposure are of more robust growth, and cabbage large and firm.

The sowing of all the sorts at every season is performed principally by broad-cast on the surface; observing, as the seeds are small and thin, particular care is requisite in sowing, to spread them regular, and not too thick, and rake them in with an even hand; or those sown in hot-beds under frames, may have earth sifted over them near a quarter of an inch deep; and in about from eight or ten to fifteen or twenty days after sowing, in either method, the plants will appear, which are to be managed according to the following directions.

Their general Culture.

When the plants of each sowing come up, their principal culture is to keep them clean from weeds, thin them where too close, and transplant some of each sowing; but as to the earliest sown plants, which come up early in spring, if attacked while very young with severe frost, those in borders may be defended with a light covering of dry long litter occasionally; and those in hot-beds, or under frames, &c. in the full ground, by covering with the glasses. The weeding and thinning the different crops of these plants may be performed occasionally by hand or hoe; observing, if designed to have a principal crop of plants to remain where sown to attain perfection, and that they form a crop of themselves, hoeing will be very beneficial culture, both to destroy weeds and thin the plants to proper distances, leaving them twelve or fifteen inches asunder, unless it is necessary to thin them by degrees, either by occasional transplantings, or by drawing out young plants for use, as they may be wanted; but when any considerable quantity of the plants are designed for transplantation, which is advisable in every crop, the weeding and thinning should principally be performed by hand; so thinning out the largest plants occasionally for transplanting, leaving

leaving enough of the others at regular distances, as above, for a crop to arrive to full size. It is, however, always proper to transplant some of each sowing, by which you will have the longer succession of good plants.

When designed to transplant any sort of Lettuce, it should be done when the plants are about three or four inches high, not much more; for when larger they are apt to flag greatly, and do not root so freely as younger plants: being careful, in drawing the plants for this purpose, to take them up with as much full root as possible; and directly proceed to plant them by line and dibble, in rows; a foot at least asunder; but if fifteen inches distant, the better, especially for the larger kinds, such as the grand admirable cabbage Lettuce, and the white and green cos, allowing the same distance between the plants in each row; and if set in the quincunx order, the plants will have still more room to grow. As soon as planted, give water, which should be repeated, if dry weather, several times for the first week or ten days, till the plants have taken fresh root, and are beginning to advance in growth.

Thus continue planting out a quantity every three weeks, from March, April, or May, until September or October, whereby you will have a daily supply of good well-cabbaged Lettuces eight or nine months in the year; and those planted out late will stand the winter, and cabbage early in spring.

But in planting out Lettuces in the advanced warm season of spring and summer, &c. it will be of much advantage to take every possible opportunity of eventual showery weather for that work; or if necessitated in summer to transplant Lettuces in hot weather, it would be advisable to draw shallow drills with an hoe, the above distances, so plant a row along the middle of each drill; which will prove of some essential advantage in facilitating the fresh-rooting of the plants, as the drills will confine the water given principally about the plants, and also retain the moisture longer than the level surface. See DRILLS.

Tying up Lettuces to forward their cabbaging, and to whiten and render them crisp, is often practised to the early spring and summer crops, particularly cos Lettuces. When the plants are well advanced in growth, and beginning naturally to form their inner leaves for cabbaging, select the forwardest, and tie all the leaves of each up close together with a piece of bafs, a little above the middle, not too strait, but so as the whole plant may have room to grow; besides, if tied too close, they are apt to rot in the heart: this work of tying, however,

is only necessary for some of the earliest plants of the forward crops, in April, or May, and June; the succeeding ones will cabbage fast enough without that aid; only observing, if any sorts should be backward in cabbaging, as is often the case with the black cos Lettuce, they may always be facilitated therein by the above practice.

Winter and early Spring Crops.

Winter Lettuces, both for winter use, and to stand the winter in warm borders and in frames, &c. for spring service, are obtained by two or three different sowings in autumn, from the middle or latter end of August until the end of September or beginning of October.

That is, to have Lettuces stand for use all winter, and early in spring, sow some hardy green and white cabbage Lettuce, brown Dutch, and white and green cos, about the middle of August, and beginning of September, in any open situation, and the plants will come up in a week or ten days; about the end of September, and in October, plant out a parcel of the best plants of each sowing, in a warm dry situation, five or six inches asunder; and in October, &c. may plant also some in frames, to be covered with glasses every cold night, and all bad weather; or for want of frames, plant them under hand-glasses, or in a bed arched over with hoops or rods, to be covered with mats in winter frosts; but if you use frames, chuse them as shallow as possible, and sink the back part a little in the ground, that the surface of the bed and plants may be but a small distance from the glasses, as it will prevent their drawing up weak and open, which is the case when in very deep frames; but in shallow ones, they will be more robust and close; and being nearer the glasses, they will be continued in a more stocky firm growth during winter. Under either of the above shelters, let the plants enjoy the free air in mild dry weather; but cover them every cold night, with the proper covers, especially after October, also in all very cold, and in very wet weather, day or night, particularly those in frames and under glasses; and as to those in hand-glasses, they may have the glasses almost constantly over them in winter, tilting up one side in mild weather, and only set them entirely off in fine mild dry days; but in sharp frosty weather keep those under every kind of shelter quite close; allowing also additional covering of mats or litter, when the frost is very intense; those in the borders may also be defended by some light litter; but at no time suffer the covering to remain longer on any of the crops than the

the bad weather continues, but indulge them with free air every mild day. By the above practice you may have Lettuces for use most part of winter, and early spring, particularly the cabbage Lettuces: those planted out first will be fit for use in November and December, and the second planting will come in towards Christmas, and being sheltered by the glasses, will continue coming in for winter and spring use till succeeded by the other latter autumn sowings; observing, according as any are gathered out of the frames or glasses, some may be removed from the borders to fill up the vacancy, whereby the glasses may be constantly employed during the winter.

Sometimes for Lettuces intended to be planted in frames late in autumn for winter use, a moderate hot-bed is made for their reception, in order that they may be well forwarded in the beginning of winter; and if the heat is continued moderately by aid of linings, allowing plenty of air all mild weather, the plants will be very fine by Christmas.

Winter-standng Spring Crops.

But to have Lettuces principally for spring use, some seed should be sown toward the middle and latter end of August to stand the winter, some where sown, others to be transplanted into warm borders, to stand without any other shelter than that of the walls or other fences; and another sowing should be performed about the middle of September, to raise plants for pricking under frames to have shelter of the glasses all winter, to be as a reserve in case those in the borders are destroyed; if both stand, one will succeed the other.

In the former case a quantity of the plants, when two or three inches high, in October, or early in November, should be planted out into a south border, under a wall, &c. and in some other warm dry situation, in rows six inches asunder, and four inches in the rows; or may also plant some close under a south wall, or other fence, in a foot-wide space all the way along, pricking them therein three or four inches distance; they will have better chance of standing the winter than those situated more distant from the shelter of the wall; and thus in each method the plants are to remain to take their chance all winter: out of the whole many of them will probably escape the frost; but in very severe weather they may be protected by a light covering of dry long litter, which remove away again in due time when the frost breaks. In March or April, if they remain too thick, some should be thinned out and planted in another place, in rows, twelve or fifteen inches asunder; these crops,

thus wintered in the open ground, will come in for use in April and May, to succeed those others sown in autumn, and sheltered occasionally all winter, and will remain good till the spring-sown plants come in.

In the latter case, i. e. those sown in September, to be wintered in frames, should be planted therein about the latter end of October, or beginning of November, planting them in rows from the back to the front of the frame, three inches distance; close the earth well about each plant, finish with a moderate watering all over the plants, and put on the glasses to promote their more speedy rooting anew, shoving the lights, however, two or three inches down, to give vent to the moist vapour arising from the mould; but when the plants have taken fresh root, and set to growing, admit the full air every mild dry day, by taking the glasses entirely off, which must be continued throughout the winter season, in all dry mild weather, but put them on every night, in cold or very wet weather especially; even also a-days when great rains prevail; and in frosty weather keep the glasses always on, except in the middle of sunny days, and the frost but slight; but when the frost is very severe, keep them close night and day, using also other covering of mats or long litter over the glasses, and around the sides of the frame. During the winter, keep all decayed leaves picked off; and as the spring and warm weather advances, let them have the benefit of warm showers.

Those thus wintered may be effectually preserved, if those in the open ground should be destroyed by the frost or excessive moisture.

In March transplant some of them into the open ground, in rows, a foot asunder, water them moderately till fresh-rooted; observing to leave a crop remaining in the frames or winter-bed, a foot also apart, to stand to cabbage; which will arrive to perfection some considerable time before the transplanted ones, and those that have been fully exposed all winter.

For want of frames for the above purpose, a quantity of the plants may be pricked out under hand or bell-glasses in autumn, to stand the winter, either by themselves for a full crop, or may plant some under the hand or bell-glasses, that are placed over early cauliflowers, as practised by the London gardeners, planting them round just within the glasses; managing them as directed for those in the frames, and as early cauliflowers under hand or bell-glasses; or for want either of a sufficiency of frames or hand-glasses, plant out a quantity in October, in four-foot wide beds,

beds, in a warm situation, and arch the beds over with hoops or rods, to cover with mats and litter in bad weather, as aforesaid: they will here have a better chance of surviving the winter than those fully exposed; and in spring transplant a quantity, by way of thinning, into other beds, as above directed.

Saving Seed of all the Sorts.

To save Lettuce seed.—Let it be remarked, that some of the early plants of all the sorts should principally be chosen for seed plants, for those of the latter crops rarely run soon enough to ripen seeds perfectly before they are attacked by the autumnal rains and cold, which greatly retard the ripening of all sorts of Lettuce seed; therefore, select either some of the winter-standing plants, or some of the forwardest plants of the February or March sowing; and of which, either plant out a quantity for that purpose in rows, fifteen inches asunder, or leave a proper quantity where sown; and when of full growth, then select a sufficiency of the largest and best cabbaged of each respective kind: mark this, if you would continue your Lettuce fine; likewise it is of importance, as before hinted, to have the different varieties intended for seed, at some distance from each other, because, if too near together, the *farina masculina* of the different sorts may mix and fecundate one another, and thereby a degeneracy or mongrel breed will be the consequence, and the true sorts would in time be lost; and it is by not observing the above particulars by those who save large quantities of seed for sale, that so many bastard bad sorts of Lettuces are dispersed about the country.

The seed ripens in August and September, but that of each plant rarely ripens all equally together; so that, according as it arrives to perfection, the respective stems, &c. of ripe seed should be pulled up or cut off in dry days, and spread upon a cloth, or tied in small bunches, and hung up across lines in a dry airy loft, for a week or two, for the seeds to dry and harden; then beat or rub them out, and clean them from the down and other rubbish, and expose them upon cloths a few days to dry for keeping; then put them up in bags for use, and hang them in a dry room.

In saving Lettuce seed, it may be observed that as Lettuces are more apt to degenerate than many others of our esculent plants of the kitchen-garden, should have proper regard to the goodness, in perfect growth, of the plants of the respective varieties; and which ought to be particularly attended to by those who raise great quantities of the seed for public supply, not to leave all sorts indifferently

for seed-plants, but to reject runaway or degenerate kinds, and particularly such as shoot for seed before they attain to any tolerable size of growth and fulness in the heart for cabbaging, as the seed of which would mostly produce similar runaway imperfect plants, and prove a great disappointment to many persons in their expected crops, as I have frequently experienced in the course of practice; for Lettuces, in the principal season, May, June, July, till September or October, if not cabbaged, in good full hearts, before they run, are of no estimation.

It is therefore of importance, in the advanced growth of the said Lettuces, to look over them occasionally, and when any discover a runaway tendency, by shooting for seed in an inferior state, before attaining some considerable size in cabbaged growth, generally pull them clean up; reserving only principally the most perfect full-growing plants of the respective varieties, to remain for seed, and from which there will be every possible chance of obtaining plants in full perfection of proper growth in return.

All sorts of Lettuce produce the greatest quantities of seed in dry warm seasons, and in wet cold autumns they ripen seed very sparingly, and that late, and often very indifferent in respect to goodness for sowing.

Lettuce seed is sold in the shops by retail, at from sixpence to a shilling the ounce; and may be had in any quantity from a quarter of an ounce to a pound, as shall be convenient, according to the extent of the garden, or demands of a family for the plants.

LAGERSTRÆMIA, a tree-like exotic, very ornamental for the green-house.

Class and order, *Polyandria Monogynia*.

Characters.] CALYX, monophyllous, bell-shaped, and divided in six parts. COROLLA, six oval, blunt, undulated petals, inserted by their claws in the cup. STAMINA, numerous slender filaments, longer than the petals, and topped with oval, incumbent anthers. PISTILLUM, a sub-globose germen, style slender, and single stigma. PERICARPUM, an oval, six-celled capsule, crowned by the style, containing many roundish, compressed, tubulate seeds.

We know but of one species, viz.

LAGERSTRÆMIA indica.

Indian Lagerstræmia.] Rises with a tree-like stem furnished with many slender branches; the leaves grow alternate, about an inch long, subsessile, oblong, entire, and smooth; the flowers are of a pink colour, and are produced in a loose terminal thyrsus, or spike, at the ends of the branches, from August to October.

This

This elegant plant is propagated by layers or cuttings.—By layers—in autumn lay the young shoots of the preceding summer, and most of them will be well rooted by the autumn following. By cuttings or slips of the same year's growth, planted early in summer in pots, and covered with small bell-glasses, and plunged in the bark-bed, watered and shaded, will grow, and may be planted out in single pots the spring following.

LANTANA, American Viburnum.

This genus consists principally of shrubby exotics of Africa and America, for the green-house and stove; growing a yard or two high, adorned with oval, oblong, and roundish simple leaves, and monopetalous, tubular, four-parted flowers.

Class and order, *Didynamia Angiospermia*.

Character.] CALYX is monophyllous, short, tubular, and four-parted. COROLLA is monopetalous, with a cylindric tube, spreading at top, and divided into four obtuse segments. STAMINA, two long and two short filaments, and roundish antheræ. PISTILLUM, a roundish germen, slender style, and crooked stigma. PERICARPUM, a roundish, drupaceous, unilocular fruit, containing a roundish, bilocular nut.

There are about five or six species retained in the English gardens, two for the green-house, the others for the stove.

Green-house Kinds.

1. LANTANA africana.

African Iron-leaved Lantana.] Hath a shrubby stalk, branching irregularly five or six feet high; oval, pointed, serrated, close-fitting, alternate leaves; and white flowers, singly, from the sides of the branches.

2. LANTANA salicifolia.

Sage-leaved Lantana.] Hath a shrubby stalk, branching five or six feet high; oblong, pointed, rough, close-fitting, opposite-leaves, four or five inches long; and flowers in clusters from the upper parts of the branches.

Hot-house Kinds.

3. LANTANA trifolia.

Trifoliate Lantana.] Hath a shrubby woolly-barked stalk, branching about a yard high; oblong, indented, rough leaves, placed some by threes, others opposite; and purple flowers in oblong roundish spikes from the ends of the branches.

4. LANTANA involucrata.

Involucrum-headed Lantana.] Hath a shrubby stalk, branching four or five feet high; roundish, indented, rough leaves, by pairs opposite; and from the ends of the branches, umbellate heads of purple flowers, attended by many small leaves like an involucrum.

5. LANTANA Camara.

Camara, or Leafless-headed Lantana.] Hath a shrubby stalk, branching five, six, or eight feet high, in different varieties; oblong, indented, rough, opposite leaves, two or three inches long; and from the sides and ends of the branches umbellate heads of yellow, purple, or red flowers in the varieties, unattended by leaves.

Variety.] Nettle-leaved leafless-headed Lantana.

6. LANTANA aculeata.

Prickly Lantana.] Hath a shrubby stalk, branching three or four feet high, the branches angulated and armed with crooked spines; oval, spear-shaped, hairy, opposite leaves; and from the sides and ends of the branches umbellated heads of scarlet flowers, having the centre ones yellow or orange-coloured.

All these species have durable woody stalks and branches, retaining their leaves mostly all the year, most of which are very rough; the flowers of all the sorts appear from June or July until winter; sometimes succeeded by largish berry-like fruit, ripening here in warm autumns.

These plants are all of foreign growth; the two first of Africa, and the others of the warm parts of America; and all of them require shelter here in cold weather, the two former of the green-house, and the other four of the stove; to must be always kept in pots of light rich earth, and placed among the plants of those two departments; the two green-house kinds may be placed in the open air all the summer; but the others only in the hottest months of that season.

Their propagation is by seeds and cuttings, in hot-beds.

By Seed.—Sow it in pots of light earth, and plunge them in a bark hot-bed, and when the young plants are some inches high, prick them in separate small pots, and plunged also in the bark-bed; and inure the green-house kinds to the open air in summer, the others but little the first season.

By Cuttings. — Cuttings of the young branches may be planted in pots in spring and summer, and plunged in a hot-bed, they will readily take root, and shoot at top the same year.

LATHYRUS, (Chickling Vetch), comprising the Everlasting and Sweet pea, &c.

The plants are herbaceous climbers; of which there are three noted species, of the flowery tribe, proper for the decoration of the pleasure-garden; a perennial, and two annuals; all of them rising with cirrhous climbing

ing stalks, mounting upon support several feet high, adorned with diphyllous cirrhous leaves, and papilionaceous flowers.

Class and order, *Diadelphia Decandria*.

Characters.] CALYX is monophyllous, bell-shaped, and five-parted at top. COROLLA is papilionaceous, having a heart-shaped standard, two oblong, lunulated, blunt wings, and a half-round keel. STAMINA, ten diadelphous filaments, and roundish antheræ. PISTILLUM, an oblong, narrow, compressed germen, flat acuminate style, and hairy stigma. PERICARPIUM, a long, compressed, acuminate, bivalvular pod, filled with roundish seeds, like garden peas.

There are many species of this genus, but not more than three or four that are commonly cultivated in gardens; all of which are for ornament.

1. LATHYRUS latifolius.

Broad-leaved perennial Lathyrus, commonly called Everlasting Pea.] Hath thick, fibry, perennial roots; climbing, thick, branching, annual stalks, having membranaceous wings between the joints, rising upon support by their cirrhi six or eight feet high; diphyllous leaves, of two spear-shaped lobes, terminated by clasps; and numerous large red or purple flowers, on long foot-stalks, appearing plentifully from June till October, succeeded by abundance of seed.

Varieties.] Red-flowered—purple-flowered—scarlet-flowered—large-flowered.

2. LATHYRUS odoratus.

Odoriferous annual Lathyrus, commonly called Sweet-scented Pea.] Hath a fibry annual root; a climbing stalk, rising upon support, by its clasps, three or four feet high; diphyllous leaves, of two oval lobes, terminated by climbing tendrils; and flowers by twos on long flower-stalks; of different colours in the varieties.

Varieties of this are,] Purple-flowered sweet-pea—white-flowered sweet-pea—variegated, or painted lady sweet-scented pea—scarlet sweet-pea. All of which flower in summer, from May or June until October, by different sowings.

3. LATHYRUS tingitanus.

Tangier annual Lathyrus, commonly called Tangier pea.] Hath a fibry annual root; climbing stalk, rising upon support four or five feet high; diphyllous leaves, of two spear-shaped alternate lobes, terminated by tendrils; and from the joints of the stalk, large reddish flowers by twos, on long foot-stalks.

4. LATHYRUS sativus.

Cultivated, Blue-flowered Lathyrus.] Hath a fibry annual root, climbing stalk, rising up-

on support, two feet high; diphyllous leaves of two lanceolate lobes, terminated by diphyllous and tetraphyllous cirrhi, and single blue flowers on long foot-stalks, succeeded by short, oval, broad, compressed pods, with a wing on the back, each containing three or four roundish seeds.

Variety.] With white flowers.

All these species of Lathyrus are herbaceous, and of hardy growth, their stalks long, slender, and furnished with cirrhi or clasps for the purpose of climbing and supporting themselves; the first sort, *Lathyrus latifolius*, is perennial, or everlasting in root, but annual in stalk; and the other three are annual in stalk and root, rising from seed in spring, and wholly perish in autumn. They all merit culture as flowery plants; but the perennial sort is the most valuable, both for its durability in root, and long continuance in bloom; the annual sorts, however, flower very ornamentally, and, by three or four different sowings, may be made to flower all summer and autumn.

These plants are proper ornamental furniture for any of the compartments of the pleasure-garden, as they prosper in any common soil; but they must be allowed support to climb upon, for they will climb by their clasps, or cirrhi, on any neighbouring support, such as sticks, bushes, trees, or any thing they can lay hold of; so should be sown in patches about the borders, and branchy sticks, such as are used for sticking peas, placed for them to ascend upon, and they will flower beautifully all summer and autumn. The everlasting pea is also proper to be placed to run up the sides of arbours and trees, and against walls and other fences, where it will have a very fine effect.

Propagation, &c.

Propagation of all the sorts is by seed in the common ground in patches, where it is designed the plants should flower, for they do not succeed so well by transplantation.

They should be sown principally in spring, though if sown in autumn, the plants will flower earlier the following year and the perennial sort once sown, the same plants remain for years by the root, and produce new stalks annually; but the annual species must be sown annually, and in order to continue a succession of bloom from the earliest part of summer, until the end of autumn, three different sowings are necessary; the first sowing may be in autumn, in November or December, or very early in spring; a second in March or April; and a third in May, &c. by which you will have plants pro-

ducing flowers in constant succession three or four months.

Sow each species and variety in separate patches, five or six to ten or twelve seeds in each, about an inch deep; when the plants are come up a few inches high, place some neat branchy sticks of proper height to each patch of plants, for them to climb upon, and keep them clean from weeds; which is all the culture they require.

The first may also be propagated by transplanting some of the roots in autumn, winter, and spring; but those rarely succeed so well as sowing the seeds where the plants are to remain.

LAVANDULA, Lavender.

This genus furnishes undershrubby evergreens for the shrubbery and green-house collection, and some to cultivate as economical plants for their flowers in family uses, and to distil for Lavender water, &c. all principally of shrubby growth; growing two or three feet high, very branchy and bushy, closely ornamented with small leaves, in some entire, others divided; and numerous small monopetalous labiated flowers in erect spikes.

Class and order, *Didynamia Gymnospermia*.

Characters.] CALYX is monophyllous and slightly indented. COROLLA is monopetalous, tubulous below, ringent, and spreading above; the upper lip biind, the under one equally trifid. STAMINA, two long and two short filaments, and small antheræ. PISTILLUM, a four-parted germen, slender style, and obtuse stigma. PERICARPIUM, none; four seeds lodging in the calyx.

There are four species cultivated in the English gardens; two for the open ground, and two for the green-house.

1. LAVANDULA *Spica*.

Long-spiked common Lavender, or Lavender Spike.] Hath a short shrubby stalk, closely branching from the bottom two or three feet high; small, spear-shaped, entire leaves; and from the ends of the branches, numerous long, erect, naked spikes of small ringent flowers, of different colours in the varieties.

Varieties.] Common narrow-leaved Lavender, with blue flowers, and with white flowers—broad-leaved Lavender—dwarf Lavender: all of them flowering in July.

This species is the common Lavender; but the narrow leaved variety, with blue flowers, is the sort commonly cultivated for its flowers for medicine, &c.

2. LAVANDULA *Stæchas*.

Common Stæchas, or French Lavender.]

Hath a shrubby very branchy stalk, rising two or three feet high; very narrow, spear-shaped, pointed, hoary leaves, opposite; and all the branches terminated by short bushy spikes of purple flowers in June and July; succeeded by seeds in August.

Variety.] With white flowers.

3. LAVANDULA *dentata*.

Dentate-leaved Stæchas.] Hath a woody stalk, branching on every side three or four feet high; leaves deeply indented in a pinnated manner; and the branches terminated by scaly, four-cornered spikes of flowers, appearing most part of summer.

4. LAVANDULA *multifida*.

Multifid-leaved Canary Lavender.] With leaves doubly-pinnatifid, many-parted.

All these plants are shrubby, durable in root, stem, and branches, and will indure several years in a moderately dry soil; but in a very moist soil are apt to go off in winter:—may be planted in spring or autumn.

The two first species are proper both to cultivate in kitchen-gardens, less or more, as required for their annual production of flowers, especially those of the common spiked Lavender, being the most estimable for their fragrant aromatic property, to use on several domestic occasions; and the plants also of both species are very eligible little bushy evergreens to plant in the pleasure-ground to adorn the front of small shrubbery compartments, where they will increase the variety very agreeably; and are finely-scented aromatics, both when growing, and their flowers when gathered, especially those of the first species afore said, which are in great esteem for putting among cloaths, and distilling, and other economical uses.

The flowers of the first sort, are gathered for use in July, which being the time of their perfection, cutting off the spikes close in a dry day, and tie them in small bunches for use.

The above two sorts should generally be planted in a lightish, dry soil, in which they will be of the longest duration.

The third and fourth sorts, being tender, require shelter in winter, so must be potted and placed in the green-house collection, where they will effect a good variety.

Propagation, &c.

All the sorts are propagated plentifully by slips or cuttings of their young shoots in spring.

In the first two sorts, in March or April, take off a quantity of slips or cuttings, from three or four to six inches long, strip off the under-leaves, then plant them in a shady border,

der, four inches asunder, give a good watering, repeat it occasionally in dry weather, and the plants will be well rooted in summer, each become a good plant fit to be transplanted into any place early in autumn, that is September or October; removing them, if possible, with balls of earth.

When intended to plant any of the common Lavender in the kitchen-garden or elsewhere, to produce flowers for economical purposes, set them in rows, two or three feet asunder, and about the same distance in the rows, or planted in a single row one or two feet asunder along the edge, or divisions of any compartments, in a sort of edging or dwarf hedge; and, in either of which, they will grow freely, continue durable in root, stem, and branches, several years; and produce abundant spikes of flowers annually, for gathering in June and July; and as to culture, it is principally to cut down any remaining decayed flower-stalks in autumn, to prune or cut away any disorderly out-growing branches at top and sides, and to dig the ground occasionally in spring or autumn along the rows of plants.

And those designed for the shrubbery or other similar compartments, being previously raised to some tolerable bushy growth, a foot high or more, may be planted therein, either in autumn, latter end of September, or October, &c. or in the spring, in March or April, disposing them singly, at proper distances, in assemblage with other shrubby plants of similar growth, occupying the front, or forward part of the respective compartments.

The third and fourth are also propagated by slips and cuttings, in March, April, and May, planted in pots placed under a frame, watered and shaded from the mid-day sun till they are rooted; and when a little advanced in growth, transplanted in separate small pots; and managed as other green-house exotics.

The *Lavandula Stæchas* is also often raised from seeds. Sow them in March or April, in a bed of light earth, and rake them in evenly with a light hand; the plants will rise in about a month; if dry weather, give water, and when they are three inches high, prick them out in beds, half a foot apart, and water them as they shall require until fresh-rooted; let them stand here till next spring; then you may thin out the best, and plant them where they are to remain.

LAVATERA, (*Lavatera*.) — or *Cretan Malloz*.

This genus comprises some tall herbaceous flowery annuals, and shrubby perennials, for

the pleasure-garden; all of them growing erect, from two or three to eight or ten feet high, garnished with large, roundish, heart-shaped, and angular leaves, and large quinquepetalous flowers, of the mallow kind,

Class and order, *Monadelphia Polyan-dria*.

Characters.] CALYX is double and permanent; the exterior part is of one semitri-fid leaf, and the interior is quinquefid. CÖ-ROLLA, five obcordate, plane, spreading petals. STAMINA, numerous monadelphous filaments, and kidney-shaped antheræ. PIS-TILLUM, an orbicular germen, short style, and many bristly stigmas. PERICARPIUM, numerous small capsules collected into a head covered with a hollow shield, each capsule having a kidney-shaped seed.

The most noted species are the following annuals and perennials.

Annual Kinds.

1. LAVATERA *cretica*.

Cretan Annual Lavatera.] Rises with an upright, branching, herbaceous stalk, two or three feet high, the lower branches very diffuse or spreading; large, roundish, lobated leaves, the upper ones acutely trilobate; and the foot-stalks of the flowers rising in clusters from the axillas of the leaves, each supporting one large flower of different colours in the varieties.

Varieties are,] *Cretan Lavatera* with red flowers—white flowers—and with purplish flowers.

2. LAVATERA *trimestris*.

Three-months Syrian Lavatera.] Rises with a slender herbaceous, rough stalk, branching two feet high; trilobated smooth leaves having oval-lanceolate lobes, the middle lobe much the longest; and pale-red flowers, singly on short foot-stalks.

Perennial-Biennial Shrubby Kinds.

These have tall, straight, somewhat shrubby, perennial stems, sometimes of several years' duration; others are rather biennial, or of but one or two years' continuance when a severe winter occurs.

3. LAVATERA *arborescens*.

Tree-Lavatera, commonly called Tree-Mal-loz.] Rises with a thick, strong, tree-like stem, eight or ten feet high, dividing at top into many branches; large, seven-angled, plaited, soft, woolly leaves; and from the axillas, clusters of short foot-stalks, each sustaining one large purple flower, appearing in succession from June till September.

4. LAVATERA *triloba*.

Three-lobed Shrubby Lavatera.] Rises with an upright, thick, branchy, perennial stem.

the branches numerous and spreading; trilobate, and roundish-subcordate, crenated, woolly leaves; and aggregate foot-stalks, each sustaining one light purple flower.

5. *LAVATERA alba*.

Olbian Five-lobed Shrubby Lavatera.] Rises with an upright, branching, perennial stalk, five or six feet high; large, five-lobed, soft, woolly leaves; and light-purple flowers, growing singly.

The flowers of all the species are large, composed each of five broad petals, and grow on foot-stalks from the joints of the stem and branches, in great numbers, continuing in succession from June until August or September, succeeded by plenty of seed in autumn.

The plants in general are mostly of hardy growth, to cultivate in any of the common borders, beds, and other compartments of the pleasure-ground, &c. in which the two annual species and varieties are only of one summer's duration; the others being somewhat perennial both in root and stem, are sometimes of several years' durability; depending, however, in a great measure, on having a warm dry situation, and temperate winters; as sometimes, in very moist soils in that season, and severe frosts, some become of a biennial nature, of but one or two years' continuance.

They are all proper ornaments for any part of the pleasure-ground.

The annuals particularly have singular beauty, their flowers being large, numerous, and conspicuous, and very proper furniture where large showy-flowering plants are required; and are easily and abundantly raised from seed in the open ground.

The perennial kinds are also good furniture for large borders, and shrubbery compartments, having large, straight, upright, durable stems, terminated by branchy bushy heads, and very large soft foliage, that form a fine variety in assemblage, though their flowers are often hid by their large leaves: but it should be observed of these perennial and biennial kinds, that although they grow with shrubby-like, continuing stems, sometimes of several years' durability, especially in the *Lavatera arborea*, are mostly of a somewhat soft, herbaceous-ligneous nature, and not constantly durable in the full ground in severe winters, and wet soils in that season, as before observed, and therefore should generally be allotted a tolerably dry lightish soil, otherwise they are apt to decline in two or three years' growth: they, however, may be readily replaced, as a fresh supply for succession may always be easily raised from seed in the common ground.

Propagation of all the Sorts.

They are propagated abundantly by seed in the open ground in the spring; the annuals sown in the place where they are to flower; and the perennials also either where they are to remain, -or for transplantation.

The annuals succeed generally best when sown where it is designed they shall flower, either in the borders or in pots. Sow them in spring, any time from February till May, in patches, four or five seeds in each, half an inch deep; when the plants are an inch or two high, thin them to two or three in each patch; or if only one in a place, the plants will be the stronger and more branchy; the same method is to be observed in sowing them in pots.

If intended to transplant any of these kinds from one place to another, it should be done while the plants are young, about three or four inches high; for their roots being long and not very fibry, they do not succeed so well by transplantation, as plants with more fibry roots.

The perennials are also raised plentifully by seed in a bed or border of light earth, either in patches, as above, to remain, or may be sown for transplantation, by broad-cast, and raked in, or in shallow drills, half a foot asunder; and when the plants, sown in either method for transplanting, are three or four inches high, plant them out at once in the places where they are to remain, or may be planted in nursery beds, to remain till autumn or spring, for final transplanting; or some also in pots, one plant in each, to have the protection of a green-house in severe winters, as formerly intimated.

LAURUS, Bay Tree.

This genus furnishes some eminent evergreen and deciduous trees, both for ornamental plantations, and the green-house, and stove, growing from ten or fifteen to twenty or thirty feet high; garnished with largish, oblong, mostly entire leaves, and small hexapetalous hermaphrodite flowers.

Class and order, *Enneandria Monogynia*.

Characters.] CALYX, none. COROLLA, six oval, concave, acuminate, erect petals. STAMINA, nine filaments standing by threes, and small antheræ. PISTILLUM, an oval germen, single style, and obtuse stigma. PERICARPIUM, an oval, acuminate, unilocular berry, containing an oval sharp-pointed nut or seed.

There are about eight or nine species of this genus in the British gardens, all of them natives originally of foreign parts; the common Bay, that of the south of Europe, the others

others of America and Asia; and of which species three are hardy, for the open ground, three for the green-house, and the same for the hot-house or stove; of the hardy kinds, one is a beautiful ever-green, and two deciduous; and the green-house and stove sorts are principally of the ever-green tribe.

Hardy Ever-green Kinds.

1. LAURUS nobilis.

Noble Ever-green Laurus, or Common Bay-tree.] Hath an upright trunk, branching on every side from the bottom upward, rising twenty or thirty feet high; spear-shaped, nervous, stiff, ever-green leaves, three inches long and two broad; and small, yellowish, quadrifid flowers; succeeded by red berries in autumn and winter. Is a native of Italy, &c. but has been long in the English gardens.

Varieties.] Broad-leaved Bay-tree—waved-leaved Bay-tree—narrow-leaved Bay-tree—striped-leaved Bay-tree—double-flowered Bay-tree.

The broad-leaved sort is often preserved in the green-house collection, but all the sorts may be inured to the open air all the year the same as the common Bay.

Hardy Deciduous Kinds.

2. LAURUS aestiva.

Summer-leaved, or Deciduous Bay-tree.] Rises with an upright stem, branching eight or ten feet high, covered with a purplish bark; oblong-oval, acuminate, veined, deciduous leaves, two or three inches long, half as broad, growing opposite; and small white flowers; succeeded by red berries, but none in England. Is a native of North America.

3. LAURUS Benzoin.

(Benzoin)—or Benjamin-tree.] Grows fifteen or twenty feet high, dividing into a very branchy head; oval, acute, unvened, deciduous leaves; three or four inches long, and half as broad; and small yellowish flowers, not succeeded by berries in England. Is a native of North America.

From this tree is said to be procured the medical substance, called Benjamin.

4. LAURUS Sassafras.

(Sassafras)—or Sassafras-tree.] Hath a shrub-like straight stem, branching ten or fifteen feet high; garnished with both oval and three-lobed, shining, deciduous leaves, of different sizes, from three or four to six inches long, and near as broad; and small yellowish flowers, succeeded by blackish berries, but not in England. Is a native of North America.

The wood of this tree is very fragrant, and is esteemed a great antiscorbutic; and used in

infusion, like tea, is a very powerful purifier of the blood; for which purpose great quantities of the wood are brought hither from America, and is commonly cut or rasped into chips for use. In London the infusion thereof, in the manner of tea, is sold in the saloop-shops, and about the streets, instead of saloop, or salep; but it is said that too constant use of it occasions the head-ach.

Green-house Kinds.

5. LAURUS indica.

Indian Bay-tree.] Rises with an upright straight trunk, branching regularly twenty or thirty feet high; adorned with very large, spear-shaped, plane, nervous, ever-green leaves, on reddish foot-stalks; and bunches of small whitish-green flowers; succeeded by large, oval, black berries; but do not ripen in England.

6. LAURUS Borbonia.

(Borbonia)—or Blue-berried Carolina Bay-tree.] Rises with an upright straight stem, branching fifteen or twenty feet high; large, spear-shaped, ever-green leaves, transversely veined; and long bunches of flowers, on red foot-stalks; succeeded by large blue berries, sitting in red cups.

7. LAURUS Camphora.

(Camphora)—or Camphire-tree.] Rises with a large trunk, dividing into a very branchy head, twenty or thirty feet high; spear-shaped-oval, triple-nervous, ever-green leaves; and small yellowish flowers, succeeded by black berries, but none in England. It is a native of Japan.

Every part of this tree imparts a fragrant smell of camphire; and the substance of that name is got by distilling the root and wood with water, in an alembic, having a kind of twisted straw head, through which the humidity evaporates, and the camphire sticks to it.

Stove Kinds.

8. LAURUS Cinnamomum.

(Cinnamomum)—or Cinnamon-tree.] Rises with an upright, branching stem, fifteen or twenty feet high; oval-oblong, trinervous leaves; and whitish flowers in clusters, succeeded by oval berries, but none here. Is a native of India and Egypt; and it is the bark of this tree that is the cinnamon of the shops; which grows in great plenty in the island of Ceylon in the East Indies, from whence the Dutch supply us and other European markets with that commodity.

9. LAURUS Cassia.

(Cassia)—or Bastard Cinnamon-tree.] Rises with a tree stem, and branchy head, fifteen or twenty feet high; spear-shaped, trinervous leaves;

the branches numerous and spreading; trilobate, and roundish-subcordate, crenated, woolly leaves; and aggregate foot-stalks, each sustaining one light purple flower.

5. *LAVATERA alba*.

Olbian Five-lobed Shrubby Lavatera.] Rises with an upright, branching, perennial stalk, five or six feet high; large, five-lobed, soft, woolly leaves; and light-purple flowers, growing singly.

The flowers of all the species are large, composed each of five broad petals, and grow on foot-stalks from the joints of the stem and branches, in great numbers, continuing in succession from June until August or September, succeeded by plenty of seed in autumn.

The plants in general are mostly of hardy growth, to cultivate in any of the common borders, beds, and other compartments of the pleasure-ground, &c. in which the two annual species and varieties are only of one summer's duration; the others being somewhat perennial both in root and stem, are sometimes of several years' durability; depending, however, in a great measure, on having a warm dry situation, and temperate winters; as sometimes, in very moist soils in that season, and severe frosts, some become of a biennial nature, of but one or two years' continuance.

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Propagation of all the Sorts.

They are propagated abundantly by seed in the open ground in the spring; the annuals sown in the place where they are to flower; and the perennials also either where they are to remain, or for transplantation.

The annuals succeed generally best when sown where it is designed they shall flower, either in the borders or in pots. Sow them in spring, any time from February till May, in patches, four or five seeds in each, half an inch deep; when the plants are an inch or two high, thin them to two or three in each patch; or if only one in a place, the plants will be the stronger and more branchy; the same method is to be observed in sowing them in pots.

If intended to transplant any of these kinds from one place to another, it should be done while the plants are young, about three or four inches high; for their roots being long and not very fibry, they do not succeed so well by transplantation, as plants with more fibry roots.

The perennials are also raised plentifully by seed in a bed or border of light earth, either in patches, as above, to remain, or may be sown for transplantation, by broad-cast, and raked in, or in shallow drills, half a foot asunder; and when the plants, sown in either method for transplanting, are three or four inches high, plant them out at once in the places where they are to remain, or may be planted in nursery beds, to remain till autumn or spring, for final transplanting; or some also in pots, one plant in each, to have the protection of a green-house in severe winters, as formerly intimated.

LAURUS, Bay Tree.

This genus furnishes some eminent evergreen and deciduous trees, both for ornamental plantations, and the green-house, and stove, growing from ten or fifteen to twenty or thirty feet high; garnished with largish, oblong, mostly entire leaves, and small hexapetalous hermaphrodite flowers.

Class and order, *Enneandria Monogynia*.

Characters.] *CALYX*, none. *COROLLA*, six oval, concave, acuminate, erect petals. *STAMINA*, nine filaments standing by threes, and small antheræ. *PISTILLUM*, an oval germen, single style, and obtuse stigma. *PERICARPIUM*, an oval, acuminate, unilocular berry, containing an oval sharp-pointed nut or seed.

There are about eight or nine species of this genus in the British gardens, all of them natives originally of foreign parts; the common Bay, that of the south of Europe, the others

others of America and Asia; and of which species three are hardy, for the open ground, three for the green-house, and the same for the hot-house or stove; of the hardy kinds, one is a beautiful ever-green, and two deciduous; and the green-house and stove sorts are principally of the ever-green tribe.

Hardy Ever-green Kinds.

1. LAURUS *nobilis*.

Noble Ever-green Laurus, or Common Bay-tree.] Hath an upright trunk, branching on every side from the bottom upward, rising twenty or thirty feet high; spear-shaped, nervous, stiff, ever-green leaves, three inches long and two broad; and small, yellowish, quadrifid flowers; succeeded by red berries in autumn and winter. Is a native of Italy, &c. but has been long in the English gardens.

Varieties.] Broad-leaved Bay-tree—waved-leaved Bay-tree—narrow-leaved Bay-tree—striped-leaved Bay-tree—double-flowered Bay-tree.

The broad-leaved sort is often preserved in the green-house collection, but all the sorts may be inured to the open air all the year the same as the common Bay.

Hardy Deciduous Kinds.

2. LAURUS *æstiva*.

Summer-leaved, or Deciduous Bay-tree.] Rises with an upright stem, branching eight or ten feet high, covered with a purplish bark; oblong-oval, acuminate, veined, deciduous leaves, two or three inches long, half as broad, growing opposite; and small white flowers; succeeded by red berries, but none in England. Is a native of North America.

3. LAURUS *Benzoin*.

(Benzoin)—or Benjamin-tree.] Grows fifteen or twenty feet high, dividing into a very branchy head; oval, acute, unveined, deciduous leaves; three or four inches long, and half as broad; and small yellowish flowers, not succeeded by berries in England. Is a native of North America.

From this tree is said to be procured the medical substance, called Benjamin.

4. LAURUS *Sassafras*.

(Sassafras)—or Sassafras-tree.] Hath a shrub-like straight stem, branching ten or fifteen feet high; garnished with both oval and three-lobed, shining, deciduous leaves, of different sizes, from three or four to six inches long, and near as broad; and small yellowish flowers, succeeded by blackish berries, but not in England. Is a native of North America.

The wood of this tree is very fragrant, and is esteemed a great antiscorbutic; and used in

infusion, like tea, is a very powerful purifier of the blood; for which purpose great quantities of the wood are brought hither from America, and is commonly cut or rasped into chips for use. In London the infusion thereof, in the manner of tea, is sold in the saloop-shops, and about the streets, instead of saloop, or salep; but it is said that too constant use of it occasions the head-ach.

Green-house Kinds.

5. LAURUS *indica*.

Indian Bay-tree.] Rises with an upright straight trunk, branching regularly twenty or thirty feet high; adorned with very large, spear-shaped, plane, nervous, ever-green leaves, on reddish foot-stalks; and bunches of small whitish-green flowers; succeeded by large, oval, black berries; but do not ripen in England.

6. LAURUS *Borbonia*.

(Borbonia)—or Blue-berried Carolina Bay-tree.] Rises with an upright straight stem, branching fifteen or twenty feet high; large, spear-shaped, ever-green leaves, transversely veined; and long bunches of flowers, on red foot-stalks; succeeded by large blue berries, sitting in red cups.

7. LAURUS *Camphora*.

(Camphora)—or Camphire-tree.] Rises with a large trunk, dividing into a very branchy head, twenty or thirty feet high; spear-shaped-oval, triple-nervous, ever-green leaves; and small yellowish flowers, succeeded by black berries, but none in England. It is a native of Japan.

Every part of this tree imparts a fragrant smell of camphire; and the substance of that name is got by distilling the root and wood with water, in an alembic, having a kind of twisted straw head, through which the humidity evaporates, and the camphire sticks to it.

Stove Kinds.

8. LAURUS *Cinnamomum*.

(Cinnamomum)—or Cinnamon-tree.] Rises with an upright, branching stem, fifteen or twenty feet high; oval-oblong, trinervous leaves; and whitish flowers in clusters, succeeded by oval berries, but none here. Is a native of India and Egypt; and it is the bark of this tree that is the cinnamon of the shops; which grows in great plenty in the island of Ceylon in the East Indies, from whence the Dutch supply us and other European markets with that commodity.

9. LAURUS *Cassia*.

(Cassia)—or Bastard Cinnamon-tree.] Rises with a tree stem, and branchy head, fifteen or twenty feet high; spear-shaped, trinervous leaves;

leaves; and almost perpetually flowering. Native of Malabar.

10. LAURUS *Persea*.

(*Persea*)—or *Alligator*, or *Avocado-pear*.] Rises with an upright branching stem, thirty feet high, and smooth cinereous bark; ovate, thick, coriaceous, transversely veined, shining, ever-green leaves, and terminal corymbose flowers succeeded by large, pear-shaped, eatable fruit, in South America.

The flowers of all the species of *Laurus* are small, consisting of six petals, grow usually in clusters, but have no beauty; and appear in spring and summer, which in the common Bay are succeeded here by plenty of berries; but in the other sorts, rarely any seed in England.

All the species are of the tree and shrub kind, and merit admittance in every good collection. The hardy sorts are proper for all ornamental plantations, and will succeed anywhere in common with other hardy trees and shrubs; and the tender kinds will exhibit a fine variety among the green-house exotics.

The *Laurus nobilis*, noble or common Bay-tree, is indeed a noble ever-green tree, as well as a fine aromatic, has been long an inhabitant of our gardens, and is extremely proper for any of the shrubbery plantations, where, being a lively ever-green, it will effect a fine variety at all seasons of the year. Some of the varieties of this tree are also sometimes retained as green-house plants, particularly the broad-leaved and narrow-leaved kinds, which by former botanists were considered as distinct species; but they are found to be only varieties of the common Bay; and like that sort, may be inured to the open air all the year; remarking that even the common sort, as well as these, is apt to suffer in its young branches in very rigorous winters; therefore, if thought convenient, some of the above varieties may also be potted to have shelter in winter, and to increase the variety of the green-house collection.

As this tree in its several varieties is apt to throw out many suckers from the bottom, so as sometimes to form a thicket, to have the trees grow with handsome straight stems, and regular heads, the suckers should be all cleared away, and those of them that are taken off with roots, if planted, will form good plants.

This tree, common Bay, was formerly sometimes trained in hedges for ornament and variety, in pleasure grounds, and occasionally trained against naked walls, palings, &c. to cover them in a spreading manner.

The other hardy kinds, deciduous Bay, and

the other two deciduous sorts, the *Laurus Benzoin* and *Sassafras*, also succeed in the open ground all the year, which for their singularity merit admittance in every shrubbery; and the diversity and beauty of their fine foliage will contribute exceedingly to the variety of the deciduous plantations.

The green-house kinds requiring shelter here in winter, must always be kept in pots; they are all fine plants, and should never be wanting in curious green-house collections: pot them in rich light mould, and place them in the green-house all winter, and in the open air in summer. See GREEN-HOUSE PLANTS.

The Cinnamon and other two species under the head *Stove Kinds*, being natives of hotter countries in the Indies, are rather more tender than those of the green-house, mostly require a situation in the hot-house or stove; planting them in pots of common good earth, and manage them as other woody stove plants of similar growth and quality: though the Cinnamon is also sometimes retained in the green-house collection, where accommodated with a good warm green-house for winter preservation, especially if furnished with flues to have occasional fires in severe weather; it, however, would generally be more effectually successful in a hot-house. See STOVE PLANTS.

Propagation, &c. of all the Sorts.

The common Bay is propagated by seed, layers, and suckers.

By Seed.—This should be sown soon after the berries are ripe, or early in spring, either in beds, covering them with earth near an inch deep, or in drills half a foot asunder, the same depth; the plants will come up late the same spring; observing to supply them with frequent watering during summer, and in winter defend them from severe frost, by shelter of mats, or some other covering, they being tender while young; and after having two summers' growth in the seed-bed, then, in the spring following, transplant the strongest in nursery-rows, one or two feet asunder, and a foot apart in each row; giving water in dry weather, till they have taken good root, and hoe down weeds in summer. Here they may remain till half a yard, or two or three feet high, and are then of proper growth for transplanting into the shrubbery in autumn or spring.

If the berries are sown in pots and plunged in a hot-bed in spring, it will bring the plants forwarder, being careful to inure them to the full air in summer.

By Layers.—Lay down some of the lower branches

Branches that are well furnished with young shoots; each of which shoots are to be slit-layed: they will be rooted in one year; then in spring take them off, and plant them in the nursery as directed for the seedlings.

By Suckers.—These should be taken up with good roots in autumn or spring, and planted in the nursery like the seedlings and layers.

The propagation of the deciduous Bay, Benjamin and Sassafras-tree, is by seed, by layers, and sometimes by suckers and by cuttings. The seeds or berries are procured from America, preserved in sand; which should be sown as soon after they arrive as possible, because they often lie a year before they germinate: sow them in a bed of light earth an inch deep, or may sow them in largish pots the same depth, plunging them in mould in an east border up to their rims, till spring following; and if then placed in a hot-bed; it will greatly forward the germination of the seed, and soon bring up the plants; but they must be timely inured to the full air: the young plants raised by either method, should be watered during summer, and sheltered from frost in winter, like the common Bay-feedlings; and when two years old, plant them out in nursery rows, as directed for those plants. The propagation of these two sorts by layers and suckers is the same as directed for the Bay-tree, but it is sometimes two years before the layers are rooted.

Cuttings of them will sometimes put out roots by aid of a good hot-bed.

The green-house kinds are propagated commonly by layers, but they are sometimes two years before they are sufficiently rooted. They may also be raised from seeds, procured from the places of their growth abroad, and sow them in pots; and if plunged in a hot or bark-bed, will come up the same year; but without that aid they do not always grow freely the first season; in which case, place them in the open air in summer, and in a frame, or in the green-house, near the windows, in winter; and in spring place the pots in a hot-bed, which will bring up the plants, giving air daily, and frequent waterings, and inure them by degrees to the open air as the summer advances; place them in shelter in winter, and in spring plant them in separate small pots, managing them as other green-house shrubs, &c.

The hot-house Lauruses are also propagated by the above methods, layers and seed, most generally assisted by the bark-bed of the stove, or other department under glasses; and the plants so raised, planted off into separate pots,

and have the general culture of other similar exotics of the hot-house.

LAWN, a spacious open plain of grass-ground, in a garden or park, and generally made to extend immediately in the front of the mansion of a country-seat.

A noble lawn of grass, extended in the principal front of the habitation, adds considerably to the grandeur of the garden and scite in general, and beauty of the mansion, by laying it open to the neighbouring country, as well as admitting of extensive prospects; so that where there is scope of ground, a spacious Lawn, as large as the nature of the garden admits, should always be planned in the most conspicuous part immediately adjoining the house and may be extended outward as far as shall be convenient, even beyond the limits of the garden, in large estates, continuing it forward to the utmost boundary of a park or paddock, or as far therein as the view from the house shall extend, allowing width in proportion; having each side or verge, as far as extended within the garden district, generally bounded in elegant shrubbery compartments in a varied order, separated, in some parts, by intervening spaces of grass-ground, of varied dimensions, and a serpentine gravel walk, gently winding between and through the plantations, for occasional shady, sheltered, and private walking; or a similar walk carried also along the front of said boundary plantation, and immediately adjoining the Lawn, for more open and airy walking occasionally; and in some concave sweeps of the plantations might have recesses and open spaces both of grass and gravel, of different forms and dimensions, for places of retirement, shade, &c.

The situation of a Lawn should generally be directly on the main front of the dwelling, if the nature of the ground admits; or in some cases, where there is good scope of ground, it may be continued more or less each way, but always the most considerably on the principal front, if the situation allows it, which, if it fronts the south, or towards any of the southerly points, is the most desirable aspect for a complete Lawn.

The dimensions may be from about a quarter of an acre or less, to six or eight acres or more, according to the extent and situation of the ground, and in large estates, having a park, &c. adjoining, the Lawn is often extended over ha-ha's beyond the garden, sometimes to ten, twenty, or even to fifty or sixty acres, or more.

As to figure, it is very commonly oblong, sometimes square, oval, or circular; all of which.

which may be according to fancy, or to the situation, limits, and figure of the ground; but somewhat of the oblong form is rather the most eligible; and in whatever figure the Lawn is designed, it should widen gradually from the house outward to the farthest extremity, to have the greater advantage of prospect; and in having that part of the Lawn within the limits of the pleasure-garden, bounded on each side with plantation compartments of ornamental trees and shrubs, as before intimated, should continue the homeward part of the side plantations gradually near towards each wing of the habitation; that company may sooner arrive in the walks of the plantation under shade, shelter, and retirement, when required; and the termination at the farther end of the Lawn may be either a ha-ha, to extend the prospect, if there shall be an agreeable one; otherwise, if there is no good view beyond the extreme limits, it may terminate in a shrubbery; or if the Lawn is very extensive, and no inviting prospect beyond the extreme boundary, the termination may be a plantation of stately trees, arranged in considerable sweeps and concave curves, that the imagination may conceive the view to be swallowed up in wood. When, however, the Lawn extends towards any great road, or distant agreeable prospect, so as to command views thereof, it is more in character to have the utmost verge open, so as to admit of a grand view from and to the mansion.

In the side-boundary verges of the Lawn, intended to be ornamented with pleasurable plantation compartments as before intimated, should generally have the said plantation rurally formed, airy and elegant, planted with different sorts of the most ornamental trees and shrubs, not commonly in one continued close plantation, but rather having some in distinct separated compartments and clumps, varied larger or smaller, differently formed in a somewhat natural imitation; and sometimes separated detachedly, less or more, by intervening breaks and open spaces of grass, as before mentioned, communicating both with the Lawn and interior districts; and generally having the said boundary plantation compartments varied in moderate and grander sweeps and curves, especially towards the Lawn, to avoid stiff, formal appearances, both in the figure of the Lawn and plantations thus forming; and observing in regard to planting the trees and shrubs, which being, consequently, both of deciduous and ever-green kinds, that where intended planting in distinct clumps, they may either be planted with deciduous

and evergreens alternately in separate compartments, or some of both interspersed in assemblage; having regard in either method to place the lower growth of shrubs towards the front, and the taller backward in proportion to their several statures, so as to exhibit a regular gradation of height, that the different sorts may appear conspicuous from the Lawn; and may be continued backward to some considerable depth, and backed with trees and shrubs of more lofty growth; through the internal parts of the plantation may be gravel or sand walks, some shady, others open; with here and there some spacious grass openings, of different dimensions and figures.

The homeward part of a Lawn, however, should always have each side-verge ornamented as above, with plantations, which, as the Lawn extends may gradually diminish.

Very extensive Lawns in parks or paddocks, &c. seldom have any boundary plantations immediately close to what may be generally considered as a continuation of the Lawn beyond the garden, but sometimes dotted with noble trees, dispersed in various parts, at great distances not to obstruct the view; some placed singly, others in groups by twos, threes, fives, &c. and some placed irregularly, some in triangles, sweeps, straight lines, and other different figures, to cause the greater variety, each group generally diversified with different sorts of trees, all suffered to take their own natural growth.

The grass of the Lawn, and other grass-ground communicating therewith, may be formed either by sowing grass-seed, or by laying with turf; but in very extensive works turfing would be very expensive; therefore seed is the most eligible, especially in that part of the Lawn which is extended beyond the garden. See GRASS.

It should always be kept perfectly neat, particularly the home Lawn within the garden, which should be often poled and rolled all the year, and in summer well mowed, once a week or fortnight. See GRASS.

LAWSONIA, (*Lawsonia*) or Egyptian Privet.

In this genus are two tender tree-like exotics, cultivated in some of our hot-houses for variety, growing six or eight to fifteen or eighteen feet high, in the different species; ornamented with oval-oblong leaves, and loose bunches of small quadripetalous flowers.

Class and order, *Octandria Monogynia*.

[*Characters*.] CALYX is small, quadrifid, and permanent. COROLLA, four oval-spear-shaped, spreading petals. STAMINA, eight slender filaments, the length of the corolla.

PISTIL.

PISTILLUM, a roundish germen, single, persistent style, crowned with a capitated stigma. **PERICARPIUM**, a globular, pointed, quadrilocular capsule, containing many angulated, pointed seeds.

The species are,

1. *LAWSONIA inermis*.

Mild, or thornless Egyptian Lawsonia.]

Grows with a shrubby stem, and opposite, slender, smooth branches, six or eight feet high, the bark yellowish; smallish oval-oblong, pointed leaves, and loose bunches of greyish flowers at the ends of the branches, succeeded by capsules and seeds.

2. *LAWSONIA spinosa*.

Thorny Malabarian Lawsonia.]

Grows with a tree-stem, and opposite branches, fifteen or eighteen feet high, with a light, grey bark, armed with thorns; oval-oblong leaves, and loose bunches of light-yellow flowers, at the sides and ends of the branches, succeeded by capsules of many seeds.

These plants being natives of the warm parts of India, Ægypt, Palestine, and Persia, in this country must be planted in pots, and reside mostly in the stove, except in the hot summer months, when they may be placed in the open air, and removed into the stove before attacked with cold weather in autumn.

They are propagated by seeds, sown in the spring in pots or light mould, placed in a hot-bed or bark-bed in the stove, &c. and when the plants are advanced three or four inches in growth, transplant them singly into small pots, watered and replunged in the bed, giving occasional shade till they have taken fresh root; and may afterwards be placed in any part of the stove or hot-house.

LAYING. The propagation by Layers, is particularly adapted for almost all sorts of trees and shrubs, and many herbaceous plants.

The propagation by Layers is effected by laying branches and young shoots of trees and plants in the earth, from two or three to five or six inches deep, leaving their tops out; and that part layed in the earth emits roots, some sorts in from one, two or three to five or six months, others a year, and some are two years before they are sufficiently rooted: and each layer so rooted, commences a new plant, which should then be separated from the parent; and planted in the nursery way to acquire due strength and size, for the purposes for which the different sorts are calculated. See the method of performing the operation.

Vast numbers of shrubs and trees are propagated by Layers; but is more particularly applicable to the increase of numbers of the shrub kind; because their branches grow near

the ground, convenient for Laying therein: it may also, however, be practised with equal success on fruit-trees and forest-trees, when their branches are situated low enough for Laying; though the varieties of many fruit-trees are commonly propagated by grafting and inoculation; the vine and fig, however, often by Layers; and forest-trees, for the general part, by seed, except for the continuance of varieties; then it is performed either by layers, cuttings, grafting, or budding; for plants raised by all these methods, continue exactly the same in every respect, as the parent plant from whence they were raised; for, as observed on former occasions, many sorts of plants, when raised from seed, vary so greatly, that out of numbers very few may be like the original or parent plant, as observed under the article **GRAFTING**, &c. so that Laying is a certain method both to continue any approved variety, as also to increase such shrubs or trees that do not produce seeds here, and which cannot be easily obtained; likewise is both an expeditious and plentiful mode of propagation; for by layers, many new plants are often raised in a few months, that would take two or three years to raise them the same size from seed; and in many sorts so abundantly, that all the shoots of any branch situated near the ground, or convenient for Laying, may be made each a distinct plant.

The Laying, for all sorts of the tree or shrub kinds, is generally performed on the young shoots of the preceding summer, laid in spring or autumn; and sometimes on shoots of the same year, in summer, especially of many sorts of hard-wooded ever-green trees and shrubs, that do not strike root readily in the older wood; which is generally mentioned in the culture of the respective sorts. Though many sorts of trees having their wood of a soft loose texture, layers of them, of two or several years' growth, will often grow pretty freely; but for general Laying for most sorts, the young wood of the former year, or of one or two summer's growth, are the proper parts for that operation.

But in herbaceous plants propagated by layers, such as carnations, pinks, double sweet-williams, &c. the young shoots of the same year, in June and July, are commonly the most successful for layers.

The season for performing most sorts of tree and shrub Laying is autumn and spring, though it may be performed at almost any time of the year: but the most general season is any time from September or October till March, except as above observed, for some kinds of very hard-wooded plants, which, not succeeding

succeeding by the common method of Laying in the one-year's shoot, at the above season, should be layed in the same summer's shoots in June or July, while of tender growth, before they become woody; and they will often be rooted by the end of the same summer.

Many kinds of under-shrubby and herbaceous plants will also succeed, if layed any time in spring or summer till the end of June: though June and July is the most successful for such of the herbaceous tribe, as carnations and others usually propagated by Laying, as they then root the same season in three or four to five or six weeks, proper for transplanting: it is, however, but few herbaceous plants that are propagated by that method, it being readily effected in many sorts, to continue the varieties, by slips, off-sets, or parting the roots, which is always mentioned; and by which the varieties of these kinds are continued the same as by Laying.

When intended to lay any trees or shrubs that naturally run up with stems, without furnishing any considerable quantity of lower branches eligibly situated for Laying, a sufficient number of strong plants should be set in the nursery, at proper distances, and headed down in autumn or spring after, within a few inches of the ground, that they may throw out a good quantity of young shoots the following summer, near the earth, convenient for Laying the succeeding autumn; or, if you wait another year, you will have many more shoots for the purpose of layers, by the first shoots throwing out many lateral ones, and each of which layed will form a plant; and the layers being rooted, and all cleared away, the stool remaining will furnish another crop of shoots for laying next year, and the same in succession for many years, if required.

But when layers are required from any trees that are grown up, and whose branches are at a distance from the ground, a temporary stage or scaffold is erected, on which to place pots or tubs of mould to receive the Layers.

One general method of merely Laying the branches or shoots in the earth, is practised for all sorts, as directed below; but previous to laying, they are often prepared different ways to facilitate their rooting, according as the trees of different natures require; as by simple Laying, twisting, slitting, cutting the bark, piercing the shoot, and by wiring, &c. as follows.

By Simple Laying.—This is only simply Laying the shoots in the earth, as hereafter directed, without any previous preparation of twisting, slitting, &c. and is sufficient for vast numbers of trees and shrubs of the soft-

wooded kinds: but such as do not readily root by this simple method, must have recourse to some of the following ways; and the sorts which require it are generally mentioned under their proper genera.

By Twisting the Layer.—By giving the shoot a gentle twist in the part designed to be layed, it greatly promotes and facilitates the emission of fibres from the bruised part; and layers of numerous trees and shrubs may be forwarded exceedingly in rooting by this method.

By Slitting, or Tonguing the Layer.—This is the most universal and generally most successful mode, where any preparation of the shoot is necessary to promote its rooting; it is performed by slitting the shoot at a joint underneath, up the middle, half an inch or an inch or more long, according to the size and nature of the Layer, forming a sort of tongue, nearly the same as directed for carnation Layers; Laying that part in the earth, and raise the top upright, or rather pointing inwards, so as thereby to separate the tongue of the slit from the other part, and keep the slit open; then apply the earth about the Layer, as hereunder directed.

By Cutting the Bark.—This is done by cutting the bark all round at a joint, taking out small chips thereof all the way below the cut, and laying that part in the earth, it will readily emit roots; in some sorts more freely than by any other preparation.

By Piercing the Layer.—Thrust an awl through the shoot at a joint in several places, Laying that part, and it will emit fibres from the wounds.

By Wiring the Layer.—Twist a piece of wire hard round the shoot at a joint, and prick it with an awl on each side of the wire in several places, Laying it in the earth, it will break out into roots at the confined and wounded parts; and often proves successful to such trees and shrubs that do not readily emit fibres by the other methods.

By one or other of the above methods, almost all sorts of trees and shrubs may be propagated.

Always keep in mind that in trees and shrubs, the young shoots of one or two years' growth are the proper parts for Laying; either such shoots rising immediately from the bottom, properly situated for Laying, or large lower branches furnishing plenty of such shoots, should be layed down, and all the said shoots thereon made layers: and the following is the method to be practised for Laying all sorts.

The general method of Laying all sorts of trees or plants, either by simple Laying as above,

above, or by any of the other above methods, in respect to the preparation of the shoots, is in the following manner. The ground, round each plant intended for Laying, must be digged for the reception of the Layers; and, as you proceed making excavations in the earth, lay down all the shoots or branches properly situated for this purpose; peg each down with a hooked stick; laying also all the proper young shoots on each branch or main shoot, fixing each layer from about three or four to six inches deep, according as they admit, and directly mould them in that depth, leaving the tops of every layer out of ground, from about two or three to five or six inches, according to their length, though some shorten their tops down to an eye or two only above the earth; observing to raise the top of each Layer somewhat upright, especially the slit or tongued Layers, whereby to keep the slit part open; according as all the Layers of each plant or stool are thus Layed, level in all the mould finally, and equally in every part close about every Layer, leaving an even smooth surface, with the top of each Layer out, as above directed.

Sometimes the branches of trees are so inflexible as not to be easily brought down for Laying; in which case they must be plashed, making the gash or cut on the upper side; and when they are grown too large for plashing, or that the nature of the wood will not bear that operation, they may be thrown on their sides, by opening the earth about the roots, and loosening or cutting all those on one side, that the plant may be brought to the ground to admit of Laying the branches.

When layers are to be made from greenhouse shrubs, or other plants in pots, the Laying should generally be performed in pots, either in their own, or others placed for that purpose.

After Laying in either of the above methods, there is no particular culture necessary, except in the heat of summer to give occasional waterings to keep the earth moist about the layers; which will greatly forward them, and promote a good supply of roots against autumn, when those that are properly rooted should be transplanted.

We before noticed, that some sorts will be properly rooted in the autumn after Laying, and some require two years: examine them at the proper season, October and November, and let those that are rooted be cut from the mother plant, with all the root possible, and plant them out in nursery rows, a foot or two asunder, according to their nature of growth, there to remain till of due size for their several purposes; but those of

tender quality must be potted, and placed among others of similar nature.

When the Layers are all cleared from the stools or main plants, the head of each stool, if to be continued for furnishing Layers, should be dressed; cutting off all decayed and scraggy parts, and dig the ground about them, and some fresh mould worked in close about the head, to refresh and encourage their producing a fresh supply of shoots for next year's laying.

LEDUM, Marsh Cistus, or Wild Rosemary.

An hardy evergreen shrub with linear leaves and decandrious flowers growing in clusters.

Class and order, *Decandria Monogynia*.

Characters.] CALYX, a small monophyllous cup, cut into five indentures. COROLLA, five ovate, concave, spreading petals. STAMINA, ten slender, spreading filaments, topped with oblong antheræ. PISTILLUM, a roundish germen, slender style, crowned with a blunt stigma. PERICARPIUM, a roundish, five-celled capsule, opening at the base, and containing many narrow, oblong seeds.

There are three species, but only one is kept in common in gardens.

LEDUM *palustre*.

Marsh Ledum, &c.] Rises with a slender shrubby stalk about two feet high, dividing into many slender branches, garnished with linear leaves, having revolute margins, and downy underneath; the flowers come out in small clusters at the ends of the branches, and are of a white or reddish colour.

Varieties.] Ledum with erect branches—Ledum with decumbent branches.

This plant will not thrive unless it is planted in boggy earth and in a shady situation.

It is propagated by seeds sown in a shady place in the spring, or by layers of the younger shoots; the leaves are of a strong perfume.

LEGUMEN, Legum, or Pod, a species of seed-vessel, such as that of the pea, bean, kidney-bean, &c.

A Legumen, or pod, is a seed-vessel, generally oblong, having two valves, or external openings, inclosing a number of seeds, that are fastened along one suture only, or joining of the valves, and differs from that kind of pod, by the botanist termed *siliqua*, by the latter having the seeds fastened to both the futures. See SILIQUA.

All the papilionaceous flowered plants have a Legumen for their seed-vessel, exemplified in the pea, bean, kidney-bean, lupines, &c. See PAPILIONACEUS.

LEPIDIUM, (Dittander or Pepper-wort) Garden Cress.

The principal plants in this genus, for our purpose, are those well-known small herbaceous annuals of the kitchen garden, the Cress or Cresses, of much estimation, for their warm quality, to use as prime small salad herbs at most seasons of the year, the leaves being the useful part, while in small young growth.

Class and order, *Tetradynamia Siliculosa*.

Characters.] CALYX, four-leaved and deciduous. COROLLA, four small, oval, cruciform petals. STAMINA, four long and two shorter filaments, and simple antheræ. PISTILLUM, a heart-shaped germen, single style, and obtuse stigma. PERICARPIUM, a nearly heart-shaped, compressed, bilocular pod, furnished with very small, oval, pointed seeds.

The only species which merits our notice is,

LEPIDIUM *fativum*.

Cultivated or Common Garden Cress.] Rises with small oblong leaves near the ground, multifid or cut into many minute parts; and shoots up with an upright, small, branchy stalk a foot and half high, or more, terminated by many small whitish flowers in summer, succeeded by small compressed pods and numerous very small red seeds, ripening in June, July, &c.

Varieties.] Common small multifid-leaved Cress, having the leaves finely divided—broad-leaved Cress, having the leaves much broader and less divided—curled-leaved Cress.

All the varieties are eligible to cultivate as small-salad herbs, possessing a warm or hot peppery relish, excellent to mix in the composition of a salad with larger salad plants, as lettuces, endive, celery, &c. though the common narrow-leaved variety is principally adopted for general culture, which, with other young small-salad herbs, as mustard, radish, rape, &c. are often used together alone for winter and spring salads. See SMALL SALAD HERBS.

They are all propagated or raised by seed sown, as required for use, at many different times of the year, once a week or fortnight, where a constant succession of those small herbs in quite young growth are in request, as they are in best perfection for use in salads when only a few days to a week or two old at most; otherwise, when older, they get too hot and strong rank tasted, especially in summer; so in that season should generally sow once a week or ten days, and the plants most commonly cut for use while in their first young leaves, cutting them clean up to the bottom;

though the Cress in particular, on emergent occasions, may be used in longer continuance than any of the other small-salad herbs, so as in gathering this sort, instead of cutting clean to the root, cut a little above-ground, the plants will shoot up again in fresh young leaves, which being cut as above, a further supply will rise in succession, and may thus be continued, by a repetition of gathering, for a month or two, always cutting close before they grow rank or shoot into stalks; however, this is only mentioned for occasional practice, as above, as the supply thus obtained will be of a stronger hot flavour in eating than quite young seedling plants.

Therefore, where a constant supply of those small herbs are required in good perfection in young seedling growth, some should be sown in succession every week or fortnight at furthest, all spring, summer, and autumn; and once a fortnight in winter.

The order of sowing them in the different seasons is:—generally sow in a warm south border or other similar situation, or under a frame, &c. in the early spring months; and according as the warm season advances, sow in any open compartments, all in as light earth as the garden affords; but in summer, or hot dry weather, should be mostly sown in somewhat shady borders, or if in a free situation, the bed may be shaded with mats from the scorching sun, and daily watered; and in winter, from October or November, till February or March, sow in the warmest situation, or principally in shallow frames defended with lights, or under hand-glasses: but in frosty or other very cold weather, in that season, should generally sow in moderate hot-beds, when required in a continued succession; and, on the same consideration, the hot-bed sowing is also requisite during the colder part of the spring, or at any time in cold seasons, where a supply of these and other small-salad herbs, are required to be raised as quickly as possible.

And as to the general method of sowing the seed on the different occasions, it, in all cases, should be sown very thick, especially as the plants are mostly used in small young growth, and should rise thick accordingly to furnish a sufficiency for gathering; and is most generally sown in small, flat, shallow drills about three inches asunder, sown so thick as almost to cover the earth, in a manner, and lightly earthed over a quarter of an inch thick, or less; or sometimes sown on the general surface, first raking the surface smooth, then, sowing the seed thick as above, smooth it down with the back of the spade, and either with the

the spade, spread some fine earth lightly over it as thinly as possible, or cover in by lifting the earth over evenly a small depth, just to cover all the seed properly; or sometimes in sowing broad-cast on the surface, first raking the ground a little even, sow the seed as above and rake it in lightly.

But for some further particulars in the culture of this species, Garden Cress, and all the other small-sallad herbs, as mustard, radish, rape, &c. See the two general articles of SALLAD HERBS and SMALL SALLAD HERBS.

LEUCOJUM, Great Snow-drop or Flake.

The plants are bulbous-rooted, herbaceous, flowery perennials, proper for the open borders, rising with annual stalks a foot high, terminated by hexapetalous white flowers.

Class and order, *Hexandria Monogynia*.

Characters.] **CALYX**, an oblong, compressed spatha opening on the side. **COROLLA** is bell-shaped, spreading, and of six oval petals, joined at the base. **STAMINA**, six short bristly filaments, and four-cornered, erect antheræ. **PISTILLUM**, a roundish germen under the corolla, obtuse, clavated style, and an erect bristly stigma. **PERICARPIUM**, a turbinate, trivalvular, trilocular capsule, containing numerous roundish seeds.

In this genus former botanists ranged also the *galanthus*, or common winter snow-drop, by some resemblance in their flowers; but they are very different from each other, in that the flowers of the *Leucojum* have six petals, and the *Galanthus* but three, accompanied by a very singular nectarium in the centre.

There are three species—the spring-flowering—summer-flowering—and autumnal-flowering, viz.

1. **LEUCOJUM vernum**.

Spring Leucojum.] Hath an oblong bulbous root, sending up several flat leaves, six or eight inches long; and amidst them an upright, channeled, hollow, naked stalk, about a foot high, terminated by a spatha, protruding one or two flowers on slender foot-stalks, drooping downward; flowering in March.

2. **LEUCOJUM æstivum**.

Summer Leucojum.] Hath a large, oblong, bulbous root, crowned with several long, flat, broad leaves; and amidst them an upright, thick, hollow stalk, fifteen or eighteen inches high; terminated by a spatha, protruding many white flowers, on slender foot-stalks, drooping downward; flowering in May.

3. **LEUCOJUM autumnale**.

Autumnal Leucojum.] Hath a large, oblong, bulbous root, crowned with many narrow leaves; an upright, naked, hollow stalk; terminated by a spatha, protruding many white

flowers, on long weak foot-stalks hanging downward, and very slender style; flowering in autumn.

Of these three species the two first are the most common in the English gardens.

They are all very hardy, durable in root, but annual in leaves and stalks, which arise from the root in spring, and decay in summer, &c. soon after they have flowered; but the roots abide for years, and increase exceedingly by off-sets, which may be separated every two or three years.

Their flower-stalks rise immediately from the root, naked or leafless, and the flowers stand at top, each consisting of six oval petals, that coalesce at their base; each flower droops in a snow-drop manner, succeeded by plenty of seed.

Considered as flowery plants, they are pretty ornaments for the borders, or any of the compartments contiguous to the principal walks and home-lawns; the roots may be had at the nurseries: plant them in autumn, towards the front, in patches of three roots in each, setting them three inches deep; they will flower the following year, at their usual time; and the roots may remain unremoved two or three years, when they will be increased by off-sets into large bunches, then should be taken up for separating the off-sets, and the largest roots planted again for flowering, and the off-sets in nursery-beds for a year or two.

Their propagation is by off-sets of the roots, as just observed, which they afford in tolerable plenty, and may be separated every second or third year, in summer, when their leaves decay, like other bulbs. See **BULBUS**.

They may also be raised from seed; but the seedling plants will be three or four years before they flower. Sow it in August or September, in a border of light earth half an inch deep; the plants will rise in spring, which in the second summer should be taken up at the decay of the leaf, and planted in beds till they flower, then removed to the borders.

LIGHT. Light and air are as necessary for ennobling the principles of vegetation as for the animal economy.

It has been experienced that Light is of such infinite service to the growth of vegetables, that it contributes exceedingly, both to facilitate their vegetation, and increase their perfection and duration; for it is obvious that most plants are considerably more prosperous, and attain greater perfection in a free exposure fully open to the Light and air, than in shady places; the same is observed of fruits. Those growing in a situation full to the Light

of the sun, are generally more large and fair, ripen sooner, and more perfectly, both as to beauty, and richness of flavour, than such as grow in the shade; the above reasons, therefore, should determine us to cultivate most of our principal plants and fruits in a situation open as much as possible to the full light, and influence of the sun; though upon particular occasions, in the heat of summer, a shady place may be necessary for some sorts of plants; not, however, where shaded and darkened by spreading trees, &c. but a border open above to the full light, and only shaded from the immediate rays of the sun; but for the general crops, a perfectly open, sunny, lightsome situation, free from the shade of spreading trees, is always the most eligible.

It is also observable of plants growing in garden-frames, green-houses, &c. in winter, when, in time of severe weather, covers or shutters have been obliged to be continued long over the glasses, so as to exclude the rays of light, the plants thereby, for want of light, sicken, grow pale, and assume an unhealthy appearance for a long time; the leaves often either decay or drop off; and frequently when the covers are continued very long without the admission of Light, the whole plant in many sorts gradually dwindles and perishes. Great attention is therefore requisite, in this case, when the severity of the weather obliges us to use other covers besides the glasses, to take every opportunity of a favourable day, or even an hour or two of a day, to admit the light.

The same is also observable to plants in early hot-beds, such as cucumbers, melons, &c. which, early in the year, require a covering of mats over the glasses every night, that if these additional covers are applied too soon in the afternoon, and continued late in the morning, so as to keep the plants long in darkness, it is a very considerable disadvantage to their growth, as it will cause them to grow weak, pale, and sickly. Let, therefore, the plants in those beds enjoy the light every day as long as possible, at least from the sun's rising to its setting, or longer, if the temperature of the heat of the hot-bed, and that of the external air, shall permit; for though the plants in hot-beds also grow on nights when in total darkness, yet, that being a natural cause, continue them so but two or three days, the difference in growth, for want of daylight, will soon appear.

Light being, therefore, so beneficial to plants in general, that to increase it as much as possible to those in frames, green-houses, stoves, &c. it is necessary to paint the inside of all

these departments white, to reflect the rays of light as much as possible, but more particularly on nights, and in the day-time when the severity of the season requires covers or shutters over the glasses.

LIGHTS, Garden-frame Glasses.

This term, Lights, is that commonly used by gardeners expressive of the glasses of garden-frames, which, according to the number of Lights, or separate movable glasses, are denominated — one-Light — two-Light — and three-Light frames—these being the general different sorts or sizes of garden-frames, seldom any have more than three-Lights; and the latter are the principal sized frames for general use in gardens; the other sizes, one-Light and two-Light frames, are also most useful for many occasions, as raising and nursery-frames, &c. but for the particular description, both of the frames and their respective Lights, see FRAMES.

LIGUSTICUM, Lovage.

It furnishes some tall herbaceous perennials and biennials, of aromatic quality, retained in gardens for variety and medical purposes; rising with very large, radical, many-parted leaves, and erect, branchy, annual stalks, some two yards high, others not half a yard, terminated by large umbels of yellow flowers of but little beauty.

Class and order, *Pentandria Digynia*.

Characters.] CALYX, umbellate flowers, having both the general and partial umbel multiple, the general involucre of seven unequal leaves, and the partial one three or four, and a small five-parted perianthium to each floret. COROLLA, each floret of the umbel has five plane petals. STAMINA, five short hair-like filaments, and simple antheræ. PISTILLUM, a germen under each floret, two styles, and simple stigmas. PERICARPIUM, none; an oblong, angular, channeled, divided fruit to each floret, containing two oblong seeds.

The most material species are,

1. LIGUSTICUM *Levisticum*.

(*Levisticum*)—or common Lovage.] Hath a thick, fleshy, deeply-penetrating, perennial root; crowned by very large, many-parted, radical leaves, with broad lobes, having incisions at top; upright, strong, channeled stalks, branching six or seven feet high, and all the branches terminated by large yellow umbels.

This is the sort commonly cultivated for use, and every part of the plant is aromatic, strongly scented, and medicinal, good to expel wind, warm and comfort the stomach; but the seeds are rather the most material part.

2. *LIGUSTRUM scotticum*.

Scottish Lavage.] Hath a thickish, fleshy, penetrating, perennial root, crowned by large doubly-trifoliate leaves, with broad, short, indented lobes; upright, round stalks; half a yard high; terminated by smallish yellow umbels.

Both these species flower in June and July, and ripen plenty of seeds in autumn.

They are hardy plants, durable in root, but annual in leaf and stalk, though the second sort is also sometimes biennial; both sorts may easily be raised from seed; and fresh plants from scattered seeds, will rise spontaneously.

Both the sorts may be admitted into large pleasure-grounds, to increase the variety of herbaceous perennials, and the first sort also for medicine, and will prosper in any common soil and situation.

Their propagation is by seed in autumn or early in spring: sow it in any bed or border broad-cast, and rake it in. When the plants are three or four inches high, plant them out into beds of moist earth, two feet asunder; and in autumn, those intended for the pleasure-ground should be transplanted therein; but let those for medical use remain in the beds.

LIGUSTRUM, Privet.

This genus furnishes a hardy, deciduous, and ever-green shrub for the shrubbery; both varieties of one species, adorned with oblong entire leaves, and spikes of infundibuliform white flowers, succeeded by black berries.

Class and order, *Diandria Monogynia*.

Characters.] CALYX is monophyllous, tubular, and four-parted at top. COROLLA is monopetalous, funnel-shaped, with a cylindric tube, cut at top into four oval segments. STAMINA, two filaments, and erect antheræ the length of the corolla. PISTILUM, a roundish germen, short style, and obtuse bifid stigma. PERICARPIUM, a roundish, smooth, unilocular berry, having four seeds.

Modern botanists admit but of one species, the principal of which is deciduous, and the variety an ever-green.

1. *LIGUSTRUM vulgare*.

Common Privet.—Consists of the following varieties.

Deciduous Privet.] Hath a shrubby stem, branching erectly ten or twelve feet high, the branches numerous quite from the bottom, slender, pliable, and tough; spear-shaped-oval, opposite, close-sitting, deciduous leaves, two or three inches long; and white flowers in thick erect spikes at the ends of the branches, succeeded by clusters of black berries.

Varieties of this are,] Gold-striped leaved—Silver-striped leaved.

Ever-green Privet.] Hath a shrubby, stronger upright stem, branching more erectly, twelve or fifteen feet, having numerous branches quite from the bottom, of a pliable, tough nature; spear-shaped, acute, opposite, dark, ever-green leaves, about three inches long, and half as broad; and white flowers, in erect spikes at the ends of the branches, succeeded by bunches of black berries.

Both these shrubs flower in May and June: the flowers make a tolerable appearance, and are succeeded by the berries, furnishing ripe seed in autumn, and frequently remain on the plants the greatest part of winter.

The flowers are of one funnel-shaped petal, separately small, but being collected into close spikes, are very conspicuous.

Both the varieties of these shrubs are very hardy, durable in root, stem, and branches, which are able to resist the severest cold with impunity: and as they branch numerously all the way from the bottom, closely garnished with leaves, and their berries remaining singularly ornamental great part of winter, renders them proper furniture for ornamenting the common shrubbery-compartments in assemblage; but the ever-green kind has the greatest claim to esteem, though both sorts merit admittance in the shrubbery collection, to increase the variety; hardly any situation or soil comes amiss to them, either in open or shady places, even under the shade of other trees; and in the midst of great towns and cities, particularly the deciduous kind, as is evident in London, where vast quantities are brought to the markets in spring and summer, for sale to the inhabitants, in pots, and without, to assist, among some other similar hardy plants, in ornamenting their small confined gardens, courts, and balconies, and to cover naked walls, &c. as it may be transplanted for those purposes almost any time, even in summer, by taking it up with its full spread of fibrous roots, giving some good waterings.

These shrubs are also often employed to form hedges in gardens; for which purpose, as they are closely branched to the very bottom, and thickly set with leaves, they are very well adapted, and may be made to form a close handsome hedge, and for which occasion both the sorts are eligible: the deciduous kind forms rather the closest neat hedge, and the ever-green kind is sometimes preferred on account of its continuing leaves, and for which it is well adapted to train in a spreading order to cover any unsightly naked walls, palings, &c. See HEDGES.

For

For the above purposes, the plants raised as hereafter directed, are proper when about two or three to four or five feet growth; or to form hedges, may use young plants about half a yard to two or three feet high, having them, however, all of similar height, branchy, and full from the bottom; and for shrubberies, train them with a short, single stem below and bushy above; and when of the above sizes, are eligible for the intended plantation.

The propagation of both sorts is by seed, suckers, layers, and by cuttings; all in the open ground.

By Seed.—Sow the seed in October, November, or December, in a bed of common earth, an inch deep, or in drills that depth; as they do not always grow freely the first year, they may be buried till next autumn, in pots in the ground, as practised for haws, and then sown as above. When the plants come up, keep them hand-weeded, and when a year or two old, plant them out in nursery-rows to remain two or three years, then transplanted for good where wanted.

By Suckers.—Great plenty of suckers rise annually from the roots, which may be taken up in autumn, winter, or spring, with roots, and planted in the nursery as above.

By Layers.—Lay down some of the pliable young branches in the earth, in autumn or winter, and they will be well rooted by autumn following; then cut them from the stool, with their roots, and plant them in the nursery for a year or two, or till of proper size for the purposes intended.

By Cuttings.—In autumn plant cuttings of the young shoots, eight or ten inches long, in a shady border; they will be properly rooted by next autumn, then plant them out in nursery rows, to acquire proper growth, as above.

LILIACEÆ, Liliaceous Plants, plants whose flowers resemble those of a lily.

Liliaceous plants are such as have six regular petals, in the form of a lily, or three, or even one petal deeply divided into six segments, and assume a lily-flower form; all Liliaceous plants, however, have not flowers so large as the *Lilium*; some being considerably smaller.

As the *lilium*, or common lily, has no calyx, several of the Liliaceous flowers are also destitute of a cup; and several have cups, which are all principally of that sort of cup called a spathe.

The following are the principal Liliaceous plants, distinguishing those without, and those with cups, or spathes.

Without Cups.—*Lilium*, or common lily,

all the sorts—tulip, all the kinds—fritillary, and crown imperial—hyacinth—star of Bethlehem—bastard star of Bethlehem—tuberosa—asphodelus—squill—hemerocallis, or day-lily—anthericum, or spiderwort—aloe—yucca, or Adam's needle—gloriosa, or superb lily.

With Spathes, or Cups.—Crocus—galanthus, or common snow-drop—leucojum, or great snow-drop—daffodil, narcissus, and jonquil—crinum, or asphodel lily—colchicum—iris, or flower-de-luce—hæmanthus, or blood-flower—gladiolus, or sword-lily.—Virginia spider-wort—amaryllis, including the Guernsey lily, belladonna lily, and Jacobæa lily, &c.—pancratium lily.

The greater part of all these Liliaceous plants of both classes are bulbous-rooted; some, however, have tuberous, and some fibrous roots; and all of them are perennial in root, but annual in stalk.

They all produce ornamental garden-flowers, and most of them hardy enough to grow in the open ground; some for the green-house and stove.

The culture of each sort, &c. is fully directed in their proper genera.

LILIUM, Lily.

This genus furnishes a beautiful collection of bulbous-rooted, herbaceous, flowery perennials, of majestic growth, all proper for ornamenting the pleasure-garden; rising with erect annual stalks, three or four feet high, garnished with long narrow leaves, and terminated by noble clusters of large, bell-shaped, hexapetalous flowers, of exceeding beauty.

Class and order, *Hexandria Monogynia*.

Characters.] **CALYX**, none. **COROLLA** is large, bell-shaped, and of six long petals, narrow at the base, but widening gradually upward, in some sorts erect, in others turned quite back, each of thick substance, keel-formed on the back, and a nectarium forming a longitudinal line behind near the base. **STAMINA**, six long subulate filaments, and oblong incumbent antheræ. **PISTILLUM**, an oblong, cylindric, six-furrowed germen, and a cylindric style, the length of the corolla, and a thick triangular stigma. **PERICARPium**, an oblong six-furrowed, trivalvular, trilocular capsule, filled with semi-orbicular seeds lying over each other in a double order.

This genus retains all the species and varieties of White Lily—Orange Lily—and Martagon Lily; this latter is very distinguishable from the two former, by having the petals of the corolla revolute or rolled back; but see each under its distinct head.

White

White Lily Kinds, the Flowers straight.

Of these kinds there is only one species, but which comprehends several beautiful varieties; and the common White Lily, found in most gardens, is parent of them all, and all of which have large, white, scaly, bulbous, perennial roots, crowned with leaves from autumn till summer, and send up flower-stalks annually, terminated by the flowers, which in all the varieties are pure white, though with some variations.

LILIUM candidum.

Common White Lily.] Hath a large squamous, bulbous root, crowned by a cluster of long broad leaves, close to the ground, remaining all winter and spring; amidst them, in summer, an upright firm flower-stalk, a yard or more high, garnished with many narrow leaves placed irregularly; and terminated by a long cluster of large, open, bell-shaped, pure white flowers, one above another, having the inside of the petals smooth.

Varieties of this are,] Common white Lily with striped leaves—with purple-striped flowers—double-flowered.

The two following are also supposed to be varieties only of the common white Lily, differing from it principally in that the above kinds have generally erect flowers, and these have dependent or drooping flowers, and some other variations, as in their descriptions, viz.

Dependent White Lily of Constantinople.] Hath a large scaly bulbous root; with leaves and flower-stalks like the parent sort, only the stalk is more slender, the flowers smaller, and generally growing in a dependent or drooping position.

Dependent, broad-stalked, most-floriferous white Lily of Constantinople.] Hath a bulbous root, and leaves like the other; but the stalk large, broad, and flat, sustaining at top a large bunch of smaller, pendent flowers, from fifty or sixty to a hundred in number.

All the above varieties are by modern botanists arranged as varieties only of the *Lilium candidum*, or common white Lily, obtained by the effects of culture; and that by continuing to increase them by off-sets of the root, they will all retain their differences; and by seed more varieties may be gained.

They have all great merit in the beauty of their flowers, which have also great fragrance, particularly all the single-flowered kinds; but the double sort having often such a multiplicity of petals as to exclude the stamina and antheræ, the parts from which the effluvia proceeds, that they are frequently destitute of fragrance. All the sorts, however,

demand attention as flowery plants, and are all so exceedingly hardy as to prosper in almost any soil and situation without trouble; and if intermixed with each other, and the other species of this genus, they will exhibit a delightful variety, in the beauty of their elegant flowers; and the striped-leaved variety merits double esteem, for being not only ornamental in its flowers, like the others, has also great singularity in its finely-striped leaves, which being long, broad, and elegantly striped with yellow, spreading all around flat on the ground, and abiding, appear exceedingly ornamental, but more conspicuously so in winter and early spring.

They all flower in June and July, and their stalks decay in August; then, the roots remaining for some little time at rest, is the only proper period for taking up the bulbs, when necessary, as hereafter observed.

Orange-Lily Kind, the Flowers straight.

This furnishes only one species, but which, like the former, is prolific in some eminent varieties; all with large, roundish, scaly, bulbous, perennial roots, crowned with leaves in spring that decay in autumn and winter; and annual flower-stalks terminated by the flowers, which are universally of a reddish, or orange-colour, some more fiery than others.

2. *LILIUM bulbiferum.*

Bulbiferous, or Bulb-bearing Lily.] Of which there are the following varieties:

Common Orange Lily.] Hath a large squamous bulbous root; an upright firm flower-stalk, rising three feet high; very closely garnished with oblong, narrow, rigid, dark-green, shining leaves, placed irregularly; and the top crowned by a cluster of large, open, bell-shaped, erect-growing, orange-coloured flowers, rough within.

Varieties of this.] With double flowers—with variegated leaves—dwarf-stalked.

All these sorts flower in June and July very conspicuously, and their stalks decay in August or September, when their roots remain at rest for two months; which is the time for removing them, when necessary, either to separate the off-sets, or transplant the main roots from one place to another.

They are all very hardy, and will thrive almost any where, no soil comes amiss to them, and will grow freely either in open situations, or under shade of trees, or in towns among buildings, &c.

The stalks of these sorts remain fully adorned with leaves till the decay of the flowers, &c.

Bulbiferous Fiery Lily.] Hath a scaly, bulbous

bulbous root; an upright firm flower-stalk, half a yard or two feet high, garnished with narrow leaves, placed scattering; and bearing bulbs at the joints; and terminated by smaller upright, bright flame-coloured flowers.

Varieties of this.] Greater broad-leaved bulbiferous Lily—many-flowered bulbiferous Lily—small bulbiferous Lily—hoary bulbiferous Lily.

All these bulbiferous kinds flower ornamentally in June and July, at which time all the sorts bear many small bulbs on their flower-stalks, which are embryo plants, and if taken off when the stalks decay, and planted in any bed or border, they will readily grow, and flower the second year. All the sorts, however, increase also abundantly by off-sets of the root, and may be taken off in autumn, as observed above for the Orange Lilies.

These sorts are also all as hardy as the Orange Lilies, and will grow in any soil and situation.

Martagon Kinds, the Flowers reflexed.

There are several species, all of which differ from the white and orange Lily kinds, in having the flowers reflexed, and the petals of the corolla revolute, or rolled quite back; they have all large, scaly, bulbous, perennial roots; leaves and flower-stalks rising annually in spring, surmounted by many flowers, generally in a reflexed or drooping position, and with all their petals turned back toward the stalk.

3. LILIUM Martagon.

Old Purple Martagon, or Turk's Cap.] Hath a large, squamous, bulbous root; upright flower-stalk, three or four feet high, garnished with broadish leaves in whorls, and terminated by large loose spikes of purplish, black-spotted, reflexed flowers, with revolute petals.

Varieties.] White-flowered Martagon—Double-flowered old Martagon—red old Martagon with hairy stalks—imperial old Martagon with divided stalks.

This species and varieties have been long inhabitants of our gardens; they all flower in June, have a good appearance, but impart a disagreeable odour.

4. LILIUM pomponium.

Pompony Martagon.] Hath a large, scaly, bulbous root; an upright flower-stalk, three or four feet high, garnished with narrow awl-shaped leaves, placed sparsely; and the top terminated by many reflexed, bright-red flowers, having revolute petals.

Varieties.] Pompony double red Martagon—white pompony Martagon—double white

Martagon—red-spotted Martagon—white-spotted pompony Martagon—yellow pompony Martagon—yellow-spotted pompony Martagon—early scarlet Martagon—major scarlet pompony Martagon.

All these pompony Martagons flower in June, and make a fine appearance, their flowers being large and numerous.

They are hardy, grow freely any where, and may be propagated plentifully by off-sets, when their stalks decay.

5. LILIUM chalcidonicum.

Chalcidonian Scarlet Martagon.] Hath a large bulbous root; an upright thick flower-stalk, three feet high, closely garnished with broad spear-shaped leaves, placed irregularly; and terminated by several large, reflexed, bright scarlet flowers, with revolute petals.

Varieties.] With deep-scarlet flowers—with purple flowers—with large bunches of flowers.

They all flower in July, and make a very fine appearance; will grow any where, and multiply fast by off-sets of the root.

6. LILIUM superbum.

Superb Pyramidal Martagon, or American Lily.] Hath a large, scaly, bulbous root; an upright, strong stalk, rising four or five feet high, garnished with broad, spear-shaped, scattered leaves; and the stem branching pyramidally, producing large, bell-shaped, reflexed, orange and yellow black-spotted flowers, in a superb pyramid, singularly beautiful in June and July.

This makes a noble appearance, and is worthy of a place in every collection.

7. LILIUM canadense.

Canada Spotted Martagon.] Hath a scaly bulbous root; an upright strong stalk, rising four or five feet high, garnished with oblong, pointed leaves in whorls; and terminated by numerous, large, bell-shaped, reflexed, yellow flowers, spotted with black, having the petals scarcely revolute.

This flowers in August, is a fine majestic plant, and makes a grand appearance during the time of its blow.

Variety.] With deep yellow flowers.

With erect Flowers.

8. LILIUM philadelphicum.

Philadelphian Bell-flower Lily.] Hath a bulbous root, upright stem, with the leaves in whorls, and erect, bell-shaped flowers, with clawed petals.

9. LILIUM camtschatense.

Kamtschatka Bell-flowered Lily.] Hath a bulbous root, upright stem, with the leaves in whorls, and erect, bell-shaped flowers, the petals sessile.

All these species of *Lilium*, and respective varieties, are universally bulbous in root, as before observed, mostly very large, composed of numerous squamæ, or scales, increase considerably by off-sets, and are all perennials; but are annual in stalk, which always rises directly from the root in spring, crowned immediately with the flower-buds, which, in all the sorts, stand naked without any sort of calyx or cup; each flower is large, and of six oblong petals, blowing in perfection principally in June, July, and August, succeeded by seed in autumn; then the stalks decay, and the roots cease to grow for some space of time that season; which period of rest, before the bulbs begin again to grow, is the most proper time to remove them, when necessary, either to separate the off-sets for increase, or to transplant the main roots into another place, or to take them up for sale, &c.

They all demand esteem as plants of ornament, for the beauty of their flowers, which are of a strikingly noble appearance, and some of the grandest that adorn our gardens, though, on account of their commonness and easy culture, are rather disregarded; but even the most common sorts of them claim attention as flowery plants; as for instance, the white Lily, very common in most places, is nevertheless a very elegant flower, it adorning the top of the stalk in a vast cluster of pure snowy white flowers, that wheresoever situated, it distinguishes itself singularly ornamental, and diffuses a fragrant odour all around. All the others possess also a proportionable degree of beauty and value for the embellishment of the pleasure-ground. Therefore all the species and respective varieties are proper ornaments for every compartment of the pleasure-ground; and if the different sorts are properly intermixed, they will effect a most elegant variety, succeeding each other in blow, upwards of three months; observing if any sorts are wanted particularly for shady or close places, the common white Lily, orange Lily, and common Martagons, are the most eligible, for they will thrive under trees; and the orange Lily also often in small gardens in the midst of buildings, in towns and cities; but besides planting all the sorts for the beauty of their flowers, I would advise to have many of the striped-leaved white Lily placed towards the fronts of the most conspicuous compartments, for the beauty also of its leaves in autumn, winter, and spring, as already observed, which, if disposed alternately with the common white Lily, whose leaves are entirely green, they will exhibit the more striking variety.

One method of planting and general culture is the same for all the sorts.

The proper time for planting and transplanting them is in autumn, when their flowers and stalks decay, which is generally in August and September, the roots being then at rest for a short space of time, which is the only proper season for removing or transplanting them, and for procuring roots to plant; though the bulbs taken up at the above season of rest, may be kept out of ground, if necessary, till October or November: the white Lilies, however, do not succeed if kept long out of the earth, and all the others succeed best when planted again as soon as possible. The bulbs of all the sorts are sold at the nurseries; their prices are very reasonable; and the most proper time to apply for them is from the end of August till October, as above noticed.

Plant them singly, as they will soon increase by off-sets into large bunches, disposing them in assemblage in different parts of the borders, and towards the front of the principal shrubbery clumps; placing them three or four inches deep, and at good distances from one another, observing to mix the different sorts in the alternate way; that is, plant first a white, next an orange Lily, &c. stationing some forward, others more back in the several compartments, to effect the greater show of variety.

Or may also plant some in separate beds by themselves, twelve or fifteen inches asunder; either of different sorts together, or each in distinct beds, or separate rows, &c.

After being planted, none of the sorts require any particular culture, for they will endure all weather at every season; so no more is necessary than destroying weeds among them by hoe; and as some of them run up with pretty tall slender stalks, they should be supported with sticks to preserve effectually their upright position, whereby their flowers will always appear to the best advantage.

They may all remain undisturbed two or three years, or longer; nor indeed is it proper to remove these sorts of bulbs oftener; for by remaining they flower stronger after the first year, and having increased by off-sets into large bunches, many stalks will rise from each bunch of roots, so as to exhibit a large cluster of flowers; it is, however, proper to take up the bulbs entirely every three or four years at least, at the decay of the stalk, to separate the increased off-sets both for propagation, and to disburthen the main roots, and give them room to take their proper growth.

Observe, that when designed to remove any of these kinds of bulbs, the proper season for it is in summer and autumn, July, August, and September, when their flower-stalks decay, and the bulbs done growing, before they begin again to emit fresh fibres below, and to form any shoot at top; after which effort of growth, it is improper to remove them that season, which would prevent their flowering the following year, and some sorts probably not the year after in full perfection; mark, therefore, the above-mentioned time for removing the roots of all these species; for although most of the sorts are so hardy that they might be removed occasionally at almost any time, both before they begin to shoot for flowering, and after the flowers decay, without any material injury to the bulbs, only the removal of them out of season, as above, greatly impedes or retards their flowering the ensuing summer: but having done their year's growth, at the decay of the flower and stalk, they become inactive for some time, not drawing any nourishment, and at which period they may be safely removed; observing, however, that, as some sorts very soon begin again to emit new fibres at bottom, and form the shoot of the future leaves and flowers, which is particularly the case of all the white Lily tribe; so that, when necessary to remove the roots, observe the proper time, as above, and not generally remove any of the sorts after they have begun to shoot again, if you would insure the next year's bloom and prosperity of the bulbs. I would, however, remark, that as some sorts, such as the orange Lily kinds, &c. do not begin to push new leaves till towards spring, the roots may more safely be removed, if necessary, any time from the decay of the flower and stalk, till toward Christmas; but would observe on the other hand, that the sooner the removal or planting is performed after the decay of the stalk, the better; for all bulbs planted early in autumn, flower stronger than such as are planted a month or two later. See BULBUS.

Such bulbs, however, which are removed at the proper period of rest, may, if occasion require it, be kept out of ground a month or two, especially in dry sand or moss, or the like, to keep them from drying and shrinking by the air; but the retention of these roots long out of the earth, should only be practised, either when necessary to keep them for sale, or to send to any distance, or that the ground is not ready for their reception, and such like occasions; though they should never be kept out of ground longer than October, or November at latest; the white Lily kinds, in par-

ticular, should be kept but as short a time as possible above ground.

Propagation of all the Sorts.

The propagation of all the sorts is most commonly by off-sets of the root; they may also be raised from seed to obtain new varieties.

By Off-sets.—All the sorts of these roots yield off-sets abundantly every year, which, when greatly wanted for propagation, may be taken off annually in autumn, otherwise once in two or three years, according as they are wanted; and the proper time of the year is in summer and autumn, when the flower is past and the stalks decayed, as observed above; observing, either to separate the off-sets from the mother bulbs in the ground, or the whole taken up, and all the off-sets, small and great, separated from the main bulbs; the small off-sets should then be planted in beds a foot asunder, and three inches deep, to remain a year or two; and the large bulbs should be planted again in the borders, &c. singly; the off-sets also in the nursery-beds, after having obtained size and strength for flowering in perfection, may be planted out where wanted.

By Seed.—This is sometimes practised, but more particularly for the Martagons, to obtain more varieties. In autumn, soon after the seed is ripe, sow it in pots or boxes of rich light earth, half an inch deep; place the pots in a sheltered situation all winter, and the plants will appear in the spring; when, in April, remove the pots to have only the morning sun all the summer, giving moderate waterings; in August transplant the bulbs into nursery-beds in flat drills an inch deep, and three or four asunder; but as the bulbs will be very small, scatter the earth and bulbs together in the drills, and cover them with earth the above depth; and having grown here till August or September following, transplant them into another bed, placing them eight or nine inches each way asunder, here to remain to show their first flowers; then transplant them finally into the pleasure-ground.

LIMODORUM, Bastard Hellebore.

This genus consists of herbaceous, bulbous-rooted perennials for ornamenting the stove, having erect, annual stalks, and pentapetalous, nectariferous flowers.

Class and order, *Gynandria Diandria*.

Characters.] CALYX, a vague spatha protruding the flower. COROLLA, five ovate, oblong, spreading petals, the two upper ones connivent, and a monophyllous concave nectarium the length of the petals. STAMINA, two gynandrious filaments in an oblong body, rising

rising upward, and topped with ovate twin antheræ. PISTILLUM, a columnar germen the length of the corolla, and placed below the flower; the style slender, crowned with a funnel-shaped stigma. PERICARPIUM, a columnar capsule with three valves and one cell, opening at the angles, containing many scabiform seeds.

The most remarkable species are,

1. LIMODORUM *tuberosum*.

Tuberous-rooted American Limodorum.] Hath a bulbo-tuberous root, from which arise three or four leaves, each narrowed at the base, nine or ten inches long, and near an inch broad in the middle, ending in a point; the flower-stalk arises from the root to about eighteen inches high, on the extremity of which the flowers are placed in a spike, about five or six in number, and inclining all one way; they are of a purplish-red colour and bearded, and are succeeded by a three-cornered germen which contains the seeds.

2. LIMODORUM *tankervilli*.

Tankerville Chinese Limodorum.] Hath a bulbo-fibrous root sending forth three or four oblong-oval, pointed leaves, plaited and narrowed at their base, about eighteen inches long, and six or seven wide in the middle; the flower stalk arises from the root upwards of two feet high, furnished with a long spike of large and most beautiful flowers, each consisting of five oblong spreading petals of a pure white on their upper side and brown beneath, with a large concave nectarium tinged with red towards the extremity; they are succeeded by a three-cornered columnar germen containing the seeds.

These beautiful plants should be always kept in the stove: they are increased by offsets which arise from the roots; these may be taken off in autumn or spring and planted singly into small pots, and immediately plunged into the bark-bed.

LINING Hot-beds; the work of applying a layer of hot-dung to the sides of the beds to revive the declining heat.

This business of Lining is a most essentially necessary work occasionally in the culture of all principal dung hot-beds in early seasons of the year, or that are made any time in winter or spring, from October or November, &c. till the end of April or beginning or middle of May; for as these hot-beds generally in three or four to five or six weeks, according to their substance, begin to decline less or more in their requisite degree of heat, they require a revival thereof, accordingly, to continue them in regular heat of eligible temperature; which in dung hot-beds can only be effected by ap-

plication of Linings of fresh hot dung to the sides, commonly called Lining the bed; and by the aid of which, communicating its fresh lively heat internally to the bed, the decreasing heat is revived in a renewed degree for two or three weeks longer, when, by adding a fresh Lining to one or both sides, is again revived in a similar manner; and thus, by occasional repetition of two, three, or more Linings, a hot-bed is continued in a proper degree of heat several months, as exemplified in early cucumber and melon hot-beds, which, without the aid of occasional Linings, would not retain sufficient heat to forward their respective plants, &c. to proper perfection.

The dung for this purpose of Linings must be of the best fresh horse stable-dung, moist and full of a lively steamy heat, such as described under the articles HORSE-DUNG and HOT-BEDS; and to be prepared for this occasion in the manner there advised; and in proper quantity to make the Linings substantial, fifteen or eighteen inches wide, and as high as the dung of the hot-bed; for if too slender, they would not effect the intended purpose, especially in early beds, or the heat considerably decreased.

So that in proceeding in early hot-bed work, should, according to the extent of your bed or beds, and season of the year, be careful to allot and reserve always a sufficiency of dung for Linings; early beds in very cold weather will generally require more substantial and frequent Linings than later-made beds in the advanced spring months; and some hot-beds, for slight or temporary occasions just to raise some plants for two or three weeks, will sometimes require but very little or no Lining: likewise hot-beds made late, such as in the beginning or any time in May, will need but very trifling Lining, or some not at all, except in some particular occasions, in plants being rather backward in growth, the weather cold, and the bed declined much in heat, when probably, even in May, or beginning of June, a final moderate Lining may be necessary in some sorts of tender plants.

Agreeably therefore to the foregoing intimations, apply the requisite Linings to the respective hot-beds in proper time, according as you shall judge it necessary on examining the state of heat of the said beds; not let them decline too considerably before you apply the Lining, whereby to continue always a moderately-lively heat, but never violent:—mark this; and on which consideration, be not over hasty in applying a Lining while the beds are in some tolerably brisk heat; or sometimes apply the Lining by degrees, raising it only half way at first, adding more in height in a few

few days after; and so proceed till raised to the height of the hot-bed.

In applying the Linings, it is generally eligible to line only one side at a time, commonly the back part of the bed first; and in a week or fortnight after line the front side, and both ends, if thought necessary; or in particular cases of the hot-bed having suddenly declined, or been permitted to decrease very considerably in heat before applying the requisite Lining, may line both sides moderately at once, about twelve or fifteen inches width, and only as high as the dung of the bed at first; may be a little augmented by degrees according as the dung of the Lining settles lower.

The requisite general substance of the Linings is from twelve to fifteen or eighteen inches width in dung, and as high as the dung of the bed, or sometimes a few inches higher; but for early beds of cucumbers, melons, or other plants of long continuance in hot-beds, the Linings should generally be laid fifteen to eighteen inches width at bottom, according as you may conceive it necessary, narrowing the width gradually upwards to eight, ten, or twelve inches at top, which may be raised at once to the full height of the dung of the bed, or but a few inches higher up the side of the frame, to allow for settling; or, however, if a strong Lining, be rather cautious in raising it much above the dung of the hot-bed, especially if very strong, hot, steamy dung in the Lining, for fear either of its throwing in a too strong heat above to burn the internal earth of the bed, or imparting a copious rank steam to penetrate within the frame, which would steam-scald tender plants of cucumbers, melons, tender annuals, &c.

But generally as soon as the Linings are raised to the intended proper height, agreeable to the above intimation, it is proper to lay a stratum of earth at top two inches thick, close up to the bed or bottom part of the frame, sloping a little outward to throw off the falling wet of rain, or snow, &c. which top covering of earth is essential, both to keep down the heat of the Lining from escaping too considerably above, that it may be confined and directed more effectually to its intended purpose of imparting its whole or principal heat internally to the revival of that of the bed; and also the top stratum of earth keeps down the strong steam, common in Linings, and prevents its arising immediately from the rank dung, and entering the frame at bottom, or through any small crevice thereof, or at top, where the Lights are occasionally raised for the admission of fresh air, and for the internal

steam of the bed to evaporate; as the rancid dung steam, without being moderated by first passing through a stratum of earth, if it enters within the frame considerably, would prove very pernicious to most plants, and the total destruction of some.

Or, occasionally in applying the Linings, may raise them by degrees, as before hinted; beginning before the heat of the bed is much declined; raising the Lining only about half way up at first, and so advancing it gradually to the proper height, as above, observing the same precautions.

According as the heat of the Linings declines considerably, they must be renewed by a supply of fresh hot dung, and in which may apply the dung to the back and front sides of the bed, in alternate order, at one or two weeks' interval; first the back, generally the most substantially, and afterwards the front, &c. in the order as above.

In renewing the Linings, it may sometimes be effected by turning over, and shaking up the same dung mixedly together, directly forming it again into a Lining; or only use some of the best or least decayed or exhausted parts of the old Lining, mixing it up properly with a good supply of new dung, so applying it immediately in a proper substantial Lining as before, using the same precaution formerly advised.

But when the dung of the Linings is greatly exhausted, should use mostly or wholly fresh dung in the renewal, where a sufficiency is conveniently attainable.

Sometimes Linings of hot-dung are used substantially in working some sorts of forcing frames, in raising early flowers and fruits, by applying the dung against the back of the frame two or three feet width at bottom, narrowing gradually to a foot and half, or less, at the top, raising the whole according to the height of the frame, four or five to six or seven feet; which heating considerably against the whole back of the frame, communicates the heat internally to warm the interior air of the inclosed frame, in which being placed pots of various sorts of any desirable flower-plants, roots, seeds, &c. or also some pots of dwarf fruit-trees, such as cherries, peaches, &c. or some planted in the borders within; also vines, or some branches of these conducted internally from trees planted on the outside; and all of which, by the internal heat communicated by the strong Lining behind, are forwarded to early production; supporting the internal heat by renewing the Linings according to the above directions. See FORCING FRAMES.

And Linings of dung are sometimes used in supporting the heat of nursery hot-beds of young

young pine-apple plants, and some other exotics of the hot-house or stove, both in dung and tan-bark hot-beds, under proper frames and glasses; and especially those wintered in these detached hot-beds distinct from the hot-house, &c. and in which a constant regular heat, almost equal to that of a stove, must be supported, so as when the natural heat of the bed is on the decline, a strong lining of hot dung is applied, more particularly to a dung bed, half a yard or two feet wide below, narrowing moderately upward, and continued the same on both sides occasionally, in the order as above; and according as the heat of the lining subsides, it must be immediately renewed by a supply of fresh dung, either worked up with the best of that of the declined Lining, or, if this is much decayed, have wholly new; so, with either of which, directly form a new substantial Lining, as in the first: and thus may maintain the hot-bed in a proper degree of heat from autumn till spring, when probably, if a dung bed, it will be much decayed, when an entire new bed will be necessary, and the plants in their pots removed therein, and the requisite heat supported as before by Linings.

All the decayed dung of the different occasional Linings, when done with for that occasion, become most excellent manure for the Kitchen-garden, as observed of the Dung Hot-bed, under that article.

LINUM, Lint, or Flax.

This genus consists of herbaceous annuals and perennials of erect growth, proper both for valuable economical uses, and to form variety in gardens. The common flax being a most valuable annual for field culture, for the bark of its stalks to make linen, and its seeds linseed-oil; and some of the perennials serve to adorn the pleasure-ground; all of them rising with erect stalks from about two to four or five feet high, garnished with narrow leaves, and terminated by small funnel-shaped quinquepetalous flowers.

Class and order, *Pentandria Pentagynia*.

Characters.] CALYX, five spear-shaped permanent leaves. COROLLA is funnel-shaped, consisting of five oblong petals. STAMINA, five awl-shaped filaments, and arrow-shaped antheræ. PISTILLUM, an oval germen, five filiform styles, and reflexed stigmas. PERICARPIMUM, a globular, pentagonous, quinquevalvular, decemlocular capsule, having one oval plane seed in each cell.

There are many species, but not more than one proper for economical uses, which is the common Flax, an annual; one sometimes cultured in gardens for variety, a perennial; and two shrubby kinds for the green-house.

1. LINUM usitatissimum.

Most Useful, or Common Cultivated Annual Flax.] Hath a taper fibry root; upright, slender, unbranched stalk, two feet and a half or a yard high, garnished with narrow, spear-shaped, alternate, grey-coloured leaves; and the stalk dividing into foot-stalks at top, terminated by small, blue, crenated flowers in June and July, succeeded by large round capsules of ten cells, containing each one seed.

This may be said to be one of the most valuable plants in the whole vegetable kingdom; as from the bark of its stalks is manufactured the Flax, or Lint, for making all sorts of linen cloth; from the rags of the linen is made paper; and from the seeds of the plant is expressed the linseed-oil, so useful in many medicinal occasions, as well as to painters, and various other trades.

The plant is annual, and is raised in fields like corn. See its *Culture*.

2. LINUM Perenne.

Perennial Siberian Flax.] Hath a fibrated perennial root, sending up annually several upright strong stalks, branching four or five feet high; garnished with small, narrow, spear-shaped, alternate, dark-green leaves, and terminated by umbellate clusters of large blue flowers in June, succeeded by seeds in autumn.

Both these species of *Linum* are hardy; the first is, but of one year's duration, the second of many by the root, but is annual in stalk.

The first is cultivated in fields for the uses before observed, but rarely in gardens, except a few plants in patches for variety; it rises from seed in spring, shoots up into stalk, gradually arriving to its full height in June and July, and having stood to perfect its seed, is then pulled and prepared for use.

The perennial sort is proper furniture for any of the large borders, or other parts of the pleasure-garden, to increase the variety.

Shrubby Green-house Kinds.

3. LINUM arboreum.

Tree-stalked Cretan Flax.] Hath a fibrous root, and upright woody stem, growing several feet high; dividing into branches, garnished with wedge-shaped leaves, placed alternate, an inch and half long; and yellow flowers produced in loose spikes at the ends of the branches; continuing in bloom most part of the summer.

4. LINUM suffruticosum.

Under-shrubby Valerian Flax.] With under-shrubby stalks, and linear, acute, rough leaves.

Propagation of the different species.

The propagation of these plants is by seed in

in spring, especially the first two species: the common sort is sown in fields, as hereafter directed, and the perennial sort in a bed or border of common garden-earth, in shallow drills six inches asunder; and when the plants are two or three inches high, thin them to the same distance, and in autumn may plant them out where wanted, where they will abide by the roots many years, producing new stalks every spring: and the green-house sorts may also be raised from seed when attainable, or more generally by layers and cuttings in a hot-bed, &c. as practised for other similar exotics: and managed in the same manner.

General Culture of the Common Flax.

But with respect to the general culture of the common Flax, this is raised in great quantities in fields in many places, both for the sake of its stalks to afford the flax for linen, and its seeds for oil, as above noticed.

It should have as good ground as possible, and this prepared for the reception of the seed, by proper repeated ploughings, and harrowings, to render the soil fine, and the surface even; and March and beginning of April is the season for sowing it: about two bushels is the proper quantity for an acre. It may be sown either broad-cast, and harrowed in with a light harrow, or may be sown in shallow drills eight or ten inches asunder, though the former is the most expeditious method; but by having it in drills, the ground can be readily hoed to destroy weeds, and which by loosening the ground, will prove also very beneficial to the crop of Flax; nor will the plants be liable to be trodden down as when they grow promiscuously.

Weeds, however, must at any rate be kept down, either by repeated hand-weedings, or by hoeing, as shall be convenient; which should be strictly attended to while the plants are young, and until they are grown above the reach of the weeds.

In the middle or latter end of August, the plants will be arrived at full growth, begin to turn yellow at bottom, and brown at top, and their seeds ripen: it is then the proper time to pull them, though if it was not for the sake of the seed, they might be pulled a little before the seeds ripen, whereby the Flax is generally better coloured and finer; but if suffered to stand till the seeds are fully ripe, it is commonly stronger, somewhat coarser, and more in quantity. It should be pulled up by handfuls, roots and all, shaking off all the mould; then either spread them on the ground by handfuls, or bind them in small bunches, and let them upright against one another, for ten days or a fortnight, till they are perfect-

ly dry and the seed ripened; then should be housed, and the seeds threshed out, winnowed and properly dried in an airy room, and then put up for use; the Flax should then be rippled and sorted, and afterwards carried to a pond or canal of water, and laid to steep, covering it down with straw hurdles, or the like, laying stones on them: and are to remain till the stalks become brittle, and the bark or rind, the useful part, separates readily from the reed; it is then properly steeped, when it must be taken out and spread by handfuls in swaths to dry, turning it occasionally till properly bleached and dried; and it is then ready for the flax-dresser.

LIQUIDAMBAR, Sweet Gum-tree.

This genus furnishes two beautiful deciduous trees for ornamental plantations, growing thirty or forty feet high, forming fine pyramidal heads, adorned with large angular and oblong leaves, and monœcious apetalous flowers.

Class and order, *Monœcia Polyandria*.

Characters.] CALYX, male and female apetalous flowers, apart on the same tree, the males numerous in conical loose catkins, and females in a globe, at the base of the male spike; the males having a four-leaved involucre, which in the females is double; and each floret a bell-shaped proper cup. COROLLA, both male and female florets are apetalous. STAMINA, numerous short filaments, incorporated in a body; and didymous, four-furrowed, bilocular, erect antheræ. PISTILLUM, an oblong germen, two subulate styles, and recurved downy stigmas. PERICARPium, many unilocular, bivalvular capsules, collected into a globular ligneous body, having many oblong seeds.

There are but two species, but very hardy trees, of the deciduous tribe, and are singular for producing a liquid, transparent, gummy substance of great fragrance.

1. LIQUIDAMBAR *Styraciflua*.

Storax-flowing Sweet Gum Tree of Virginia, or Common Liquidambar.] Rises with an upright straight stem, and regular branchy head, thirty or forty feet high; palmated-angulated leaves, of five serrated lobes; exuding a glutinous fragrant substance; and saffron-coloured flowers in amentums at the ends of the branches in April; succeeded by large roundish fruit, having many protuberances.

2. LIQUIDAMBAR *imberbe*.

Imberbous Oriental Liquidambar.] Rises with an upright stem, the branches garnished with lobate, hand-shaped leaves, yellow flowers growing in amentums, and roundish fruit.

Both

Both these trees have great merit for the embellishment of the shrubbery plantations, in assemblage with others of the deciduous tribe of similar growth; and being handsome, straight-growing trees, forming fine heads, attaining their proper height in this country, are also well adapted for planting detached as single objects in spacious grass opens to display their fine pyramidal growth; in which they will appear very ornamental, and by emitting their odoriferous particles, will perfume the circumambient air in summer.

They prosper in any common soil and situation, and endure our severest cold without injury.

Both the sorts are retained in the nurseries for sale, but the first is the most common.

Their propagation is by seed, and by layers, in the full ground.

By Seed.—The seed arrives from America in spring, when it should be sown as soon after as possible, in a bed of light earth, half an inch deep, and the plants will rise some the same year, others probably not till the spring following; indulge them with moderate waterings occasionally; keep them clean from weeds all summer, and give protection from severe frost the first two winters; and when two years old, plant them out in spring in nursery rows, two feet asunder, to remain three or four years, or till wanted for the shrubbery, &c.

But some persons sow the seeds in pots; &c. in order to move to different situations as the season requires; and that if the plants should not come up the same year, the pots may be plunged in a hot-bed the spring following to forward them.

By Layers.—In autumn lay the young shoots of the preceding summer, by slit-laying, &c. and they will most of them be rooted by autumn following, though in a dry hungry soil they are sometimes two years before they are sufficiently rooted for transplantation.

LIRIODENDRON (Lily-tree), commonly called Tulip-tree.

One large hardy deciduous tree, of North America, for ornamental plantations, constitutes this genus, adorned with large, broad, lobated leaves, and hexapetalous liliaceous flowers, fancied to resemble the form of a tulip; hence the name Tulip-tree.

Class and order, *Polyandria Polygynia*.

Characters.] **CALYX**, a two-leaved involucre, and three-leaved inner cup, all deciduous. **COROLLA** is bell-shaped, and consists of six petals, in two series, obtuse and channeled at the base; the outer three are

deciduous. **STAMINA**, numerous linear filaments, having narrow antheræ fastened longitudinally to their sides. **PISTILLUM**, numerous germina formed into a cone, no style, but a globular stigma crowning each germen. **PERICARPIUM**, none; numerous seeds collected imbricatum into a sort of cone.

There is but one known species, which formerly was termed *Tulipifera*; but is now changed by Linnæus to *Liriodendron*, from the fancied resemblance of its flower to a lily, whence it might with as much or more propriety be called Lily-tree as Tulip-tree.

LIRIODENDRON *Tulipifera*.

(*Tulipifera*)—or *Tulip-tree*.] Rises with an upright large trunk, branching irregularly forty or fifty feet high; large, lobated, alternate leaves, of three lobes, the middle one truncated, as if the end was cut off, those of the sides rounded; and from the ends of the branches bell-shaped flowers, composed of six petals in a double series, spotted with green, red, white, and yellow; appearing ornamentally in July, succeeded by large conic fruit, not ripening in England.

Some of these trees have acquired a large size and stature in England, and produce flowers, which they never effect till of some considerable age and bulk; the trunk is covered with a grey bark, and the younger wood of a bluish or brownish colour, commonly very pithy, and when broken, emits a strong aromatic odour, and the leaves are of singular structure on long foot-stalks. In America some of these trees are of the first magnitude, thirty feet in circumference, with large, very unequal, and irregular boughs; and the timber is of great use in its native soil, particularly for making that kind of boats called periaugas, which are formed of the trunk, excavated or hollowed.

This curious tree grows freely here in the full ground, and is proper for our ornamental plantations, stationing them with the deciduous kinds of similar growth; is also very proper to exhibit singly in large lawns and other spacious opens of grass-ground.

It is cultivated for sale in all the nurseries.

Its propagation is by seed.—This is imported annually from America, which may be had of the seed-dealers in spring; and is then to be sown in the full ground, in beds of light earth, placing the seed length wise, and cover it near an inch deep; the plants will come up the same year in May; observing to give water in dry weather; and if the bed is arched over with hoops, to have occasional shade from the mid-day sun in scorching weather.

weather, it will prove very beneficial to the germination of the seeds, and growth of the young plants; being also careful to continue the waterings occasionally during the summer; and in the winter, if you allow them shelter of mats in frosty weather, it will effectually preserve their tops, which being sometimes a little tender the first year, are apt to suffer by frost; however, this covering is not always absolutely necessary, for I have observed them stand very well without any. When they are two years old, plant them out in spring in nursery-rows, two feet distant, and a foot asunder in each row; there to remain a few years, till from three to six or eight feet high, then transplanted where they are always to stand.

LOBELIA, Cardinal flower (*Repuntium*.)

It consists of herbaceous and under-shrubby erect flowery perennials for the pleasure-garden and hot-house, rising with erect stalks from about two to five or six feet high, ornamented with oblong, oval, and spear-shaped, simple leaves, and ornamental spikes of beautiful, monopetalous, somewhat ringent, five-parted flowers.

Class and order, *Syngenesia Monogamia*.

Characters.] CALYX is small, monophyllous, quinque-dentate, and growing round the germen. COROLLA is monopetalous, a little ringent, and with a long cylindric tube, and five-parted limb, the two upper parts smallest, and form the upper lip, and the other largest and spreading. STAMINA, five subulate filaments, having syngenesious antheræ. PISTILLUM, an acuminate germen under the corolla, cylindric style, and obtuse, hairy stigma. PERICARPIUM, an oval bilocular capsule, opening at top, and numerous small seeds.

There are many species, but not more than five or six commonly cultivated, two hardy herbaceous kinds for the open ground, and four shrubby plants for the stove.

Hardy Herbaceous Kinds.

These are fibrous-rooted, erect-growing perennials, natives of North America, but have been long retained in the English gardens for the beauty of their flowers.

1. LOBELIA *Cardinalis*.

(*Cardinalis*)—or *Common Cardinal Flower*.] Hath a thick, fibrated, milky, perennial root, crowned with lanceolate, serrated, radical leaves; upright, firm, round stalks, rising two feet high; garnished with spear-shaped, sawed, alternate leaves; and terminated by long spikes of beautiful scarlet flowers, in July and August.

2. LOBELIA *Siphilitica*.

Siphilitic Blue Cardinal Flower.] Hath a thick, fibrated, perennial root; crowned with oval, lanceolate, crenated, radical leaves; upright firm stalks, half a yard high; garnished with leaves like the radical ones; and from the axillas, pale-blue flowers, with reflexed cups; appearing in July.

Varieties.] With deep-blue flowers—violet-coloured flowers.

Both these species flower very ornamentally, and the flowers numerous in long spikes; which, in dry warm seasons, are succeeded here by ripe seeds in autumn.

They are hardy enough to succeed in the full ground all the year in a dry warm soil, though, as being liable to suffer by severe frost, a share of them should be retained in pots for moving to shelter of a frame in frosty weather.

Tender Shrubby Kinds.

3. LOBELIA *plumierii*.

Plumier's Shrubby Lobelia.] Hath a shrubby, somewhat succulent stalk, rising five or six feet high; oval-oblong entire leaves, placed alternate; and from the sides of the stalk, white flowers, growing by two or three together on long foot-stalks.

4. LOBELIA *surinamensis*.

Surinam shrubby Lobelia.] Hath a shrubby stalk, rising several feet high; oblong, serrated, smooth leaves; and large pale red flowers from the axillas on very long foot-stalks.

5. LOBELIA *pinifolia*.

Pine-tree-leaved Shrubby Lobelia.] Hath a shrubby stalk, rising a yard high; linear, entire leaves in clusters; and blue flowers from the sides of the stalks.

6. LOBELIA *longiflora*.

Long-flowered Jamaica Lobelia.] The stem herbaceous; spear-shaped, indented leaves; and short lateral peduncles, having flowers, with a very long slender tube.

The flowers of all these species of Lobelia consist only of one petal, cylindrically tubular below, and divided at top into five parts (see the *Characters*); those of the herbaceous kinds are sometimes succeeded here by seeds, but rarely any of the others.

The two first species are very ornamental flowery plants, for the principal compartments of the pleasure-garden; but being but moderately hardy, liable to suffer by severe frost, it is proper to keep some also in pots to move to occasional shelter in frosty weather; they produce extremely showy garden-flowers; more particularly the *Lobelia Cardinalis*, in its beautiful scarlet spikes, occupying half the length of the stalks, consisting of numerous flowers; but both the sorts make a fine appearance

appearance for a month or six weeks; so both demand a place in every curious collection, to increase the variety of herbaceous flowery perennials, and for which purpose they have been long retained in most of our eminent gardens, and are kept in all the nurseries for sale.

The four tender species, being natives of the hot parts of America, Asia, and Africa, require a hot-house here, so must be kept in pots, and retained in that department; the first of them is the most common in the English gardens.

Propagation.

The two hardy herbaceous kinds are propagated by seed, cuttings of their stalks, and by parting their roots.

By Seed.—They rise from seed one year, and flower the next, and abide several years. Sow the seed in autumn, or early in spring in a warm border, or in pots or boxes to move to different situations in different seasons, to have shelter from frost, and shade from the mid-day sun in summer, &c. observing those sown in autumn generally come up more freely the following spring than those which are sown in that season; allow shelter in hard frosts, as just observed, either under a frame, or awning of mats, but should be fully exposed in all mild weather, giving occasional watering in spring and summer. When the plants are come up two or three inches, prick them out in separate small pots of rich earth, give water, and place them in the shade till fresh rooted, repeating the waterings occasionally in hot, dry weather, and shift them into larger pots as they shall require; in winter move them into a frame to have occasional shelter from inclement weather; and in spring, in March, some of them may be turned out into the full ground, when they will flower the ensuing summer; and some may be retained in pots to move to shelter in winter, to be as a reserve in case those in the open air should be killed by frost; these will also flower at their usual time in summer.

As these beautiful plants generally flower in the greatest perfection in the first and second year of their bloom, it is proper to raise a supply of new plants every year or two, in order to have them to flower in their utmost perfection annually.

By Off-sets —Both these hardy sorts sometimes afford off-sets for young plants from their sides at bottom, which may be separated in autumn, and potted, and managed as for the seedlings.

By Cuttings.—In June, if some of the

young stalks are divided into lengths of five or six inches, planted in an easterly border, two parts of three deep, covered down with hand-glasses, and watered occasionally, they will emit roots, and form young plants in a month or six weeks; the glasses should then be taken away, and manage the plants as above.

The tender kinds are propagated by seeds procured from abroad, sowing them in pots of light sandy earth, and plunged in the bark-bed; and when the plants are three inches high, plant them in separate pots, and plunged also in the bark-bed, giving water and occasional shade till rooted.

These sorts must always remain in the hot-house, and have frequent moderate waterings.

LOCULAMENTA, *Loculi*, Cells, or Pockets, the internal divisions, or departments of a capsule or other dry seed-vessel.

These *Loculi*, or Cells, are those departments of a seed-vessel which immediately contain and inclose the seeds; and in point of number, some capsules have but only one Cell, others two, three, or many; when of one Cell, it is termed *unilocular*; when of two, *bilocular*; of three, *trilocular*; of four, *quadri-locular*; of five, *quinquelocular*; of ten, *decem-locular*; of many, *multilocular*, &c. each Cell having, some but one, others several seeds; it being various in different genera.

LONICERA, Honeyfuckle.

This genus retains a grand collection of celebrated deciduous flowering shrubs, and some ever-greens, proper for all ornamental plantations, consisting both of upright growers, and twining climbers, rising from three or four to ten or twelve feet high; adorned with oblong, oval, and cordated, mostly opposite leaves, and a great profusion of elegant monopetalous, tubular, five-parted, very fragrant flowers, most part of summer.

Class and order, *Pentandria Monogynia*.

Characters.] CALYX is small, five-parted, and rests on the germen. COROLLA is monopetalous and tubulous, having an oblong gibbous tube, divided above into five reflexed segments. STAMINA, five subulate filaments, and oblong antheræ. PISTILLUM, a roundish germen under the receptacle, filiform style, and obtuse, capitated stigma. PERICARPIUM, an umbilicated, bilocular berry, containing roundish compressed seed.

In this genus are comprehended, as species, several genera of former botanists, such as the *Diervilla*, *Symphoricarpos*, or St. Peter's wort, *Periclymenum*, &c. Linnaeus discovering their flowers to possess equally the same *Characters*

as *Lonicera*, has retained them all as species only of this genus.

They may be divided into two classes, upright growers, and climbers.

Uprightish Kinds, with Flowers by pairs on each Peduncle, and their Berries by twos together.

These sorts rise with uprightish firm stalks, branching moderately, their branches mostly supporting themselves tolerably erect, forming low, upright, bushy heads; they are all hardy, deciduous, and most of them produce ornamental flowers, which, however, are rather inferior both in numbers, beauty, and fragrance, to those of the climbing kinds; but they nevertheless exhibit a pleasing elegance, and agreeable variety, in their general appearance; and are very proper furniture for the shrubbery.

The species of the above kinds commonly retained in our gardens are:

1. *LONICERA alpigena*.

Alpine Upright Red-berried Honeysuckle.] Rises with a shrubby, short, thick, upright stem, branching strong and erectly, four or five feet high; largish spear-shaped leaves, in pairs opposite; and from the sides of the branches many red flowers, by twos on long footstalks; each succeeded by two red berries joined together at their base; flowers in April and May, and the berries ripen in autumn.

2. *LONICERA cærulea*.

Blue-berried Upright Honeysuckle.] Rises with a shrubby upright stem, branching moderately three or four feet high, the branches covered with a purplish bark; oblong-lanceolate leaves, by pairs opposite; and from the sides of the branches, many white flowers by twos on short footstalks, each succeeded by a pair of blue berries joined together at the base: flowers in May, and the berries ripen in August.

3. *LONICERA nigra*.

Black-berried Upright Honeysuckle.] Rises with a shrubby upright stem, branching three or four feet high; oblong, elliptical, entire leaves; and white flowers, succeeded by black berries, single and distinct; flowering in May.

4. *LONICERA xylosteum*.

(Xylosteum)—or Fly Honeysuckle.] Rises a shrubby, strong, upright stem, branching seven or eight feet high, the branches having a whitish bark; oblong-oval, downy leaves, in pairs opposite; and from each side of the branches, erect white flowers, each succeeded by large double red berries, joined together at their base; flowers in June, and the berries ripen in September.

5. *LONICERA tatarica*.

Tartarian Honeysuckle.] Rises with a shrubby upright stem, branching erectly three or four feet high; heart-shaped opposite leaves; and whitish erect flowers, succeeded by red berries, sometimes distinct and sometimes double.

Most upright Kinds, with many Flowers on each Peduncle.

6. *LONICERA Diervilla*.

(Diervilla)—or Yellow-flowered Acadian Honeysuckle.] Rises with shrubby upright stalks, branching erect, but moderately, three or four feet high; oblong, heart-shaped, pointed, serrated leaves, by pairs opposite; the branches terminated by racemous clusters of pale-yellow flowers; flowers in May and June, continuing sometimes till autumn, but rarely ripens seed here.

7. *LONICERA Symphoricarpos*.

(Symphoricarpos)—or Shrubby St. Peter's Wort.] Rises with a shrubby rough stem, branching erect four or five feet high, the branches slender and numerous; closely garnished with small oval opposite leaves on short footstalks; and small greenish flowers round the sides of the stalk; appearing in August.

Volubilate, or Twining-climbing Kinds, with Flowers in Clusters, and Whorls and Berries in Clusters.

These sorts have mostly weak declinated stalks and branches, which, unless supported, trail along the ground, some sorts rambling to a great length; but having support of stakes, or stems of trees, &c. they will climb or twine round them many feet high, and often climb over the adjacent shrubs, hedges, or other support in their neighbourhood; for they are all volubilate climbers, ascending by twining spirally round any support, generally to the left, according to the apparent motion of the sun; they also, if trained against arbours, seats, walls, pales, &c. may be extended a considerable length, in the space of one summer; some of the sorts may also with a little trouble be trained as standards, as hereafter directed.

They are mostly of the deciduous tribe, except one species, and one or two varieties, which are ever-green: several of the sorts are remarkable for having the upper leaves sitting close, uniting at their base, so as to appear perforated by the stalk or branch; and all the sorts are remarkably floriferous; the flowers elegant and fragrant, generally continuing a month or two in succession, and the ever-green kinds much longer.

The most material species of the above kinds are:

8. *Loni-*

8. *LONICERA Periclymenum.*

(*Periclymenum*)—or *Common Climbing Honeyfuckle.*] Comprehends two principal varieties; English wild honeyfuckle—Dutch honeyfuckle, &c. each of which furnishing also some varieties.

English Wild Honeyfuckle, or Woodbine of our Woods and Hedges.] Rises with shrubby, weak, very long, slender stalks and branches, trailing on the ground, or climbing round any support, and extend many feet in length; oblong-oval opposite leaves, distinct, on short foot-stalks, and all the branches terminated by oval imbricated heads, furnishing smallish flowers of different colours in the varieties; flowering from June or July until autumn.

Varieties of this.] With white flowers—with red flowers—with striped leaves—oak-leaved, having the leaves sinuated, or cut on the edges, like those of the oak-tree—striped oak-leaved.

This species grows wild in England in great plenty in woods and hedges, and produces abundance of flowers, which however are small; but by garden-culture they are much improved: the plant and all its above varieties have generally very weak trailing stalks and branches, that they cannot be trained with upright stems, and their flowers are generally small; a few plants of each, however, are proper to introduce as climbers, to increase the variety among the others.

The following varieties grow much stronger, and produce large and more elegant flowers.

Dutch or German Honeyfuckle] Rises with a shrubby declinated stalk; and strong-shooting, long, trailing, purplish branches, advancing or climbing a considerable length; oblong-oval opposite leaves, distinct, on short foot-stalks; and all the branches terminated by oval imbricated heads, furnishing large beautiful red flowers, of fragrant odour; appearing in June and July.

Varieties of this.] Long-blowing, red German honeyfuckle—late red-flowering—ever-green late red-flowering, retaining its leaves all the year, and often its bloom till near Christmas.

9. *LONICERA Caprifolium.*

(*Caprifolium*)—or *Early Italian Honeyfuckle.*] Rises with shrubby declinated stalks, sending out long, slender, trailing, twining, greenish branches; oval, close-fitting leaves, by pairs opposite, the upper ones closely joined at their base, appearing perforated by the branch; and all the branches terminated by verticillate or whorled bunches of close-fitting flowers of great fragrance, of differ-

ent colours and time of flowering in the varieties.

Varieties of this.] Early white-flowering, appearing in May—early red-flowering, appearing also in May—late red-flowering, appearing in June and July, and is a fine sort—yellow-flowered—ever-green red flowering, the leaves large, thick, and remain all the year; and it flowers from June until the end of autumn.

This species and varieties are easily distinguished, by producing their flowers in whorled bunches, appearing as if three or four bunches grew out of one another; are large, numerous, and sweetly scented.

The following is also valuable for its large elegant flowers; but they are almost devoid of scent.

10. *LONICERA sempervirens.*

Ever-green Trumpet-flowered Honeyfuckle.] Rises with a shrubby declinated stalk, sending out slender, long, trailing, reddish branches; oblong-oval, close-fitting, shining, ever-green leaves, in pairs opposite, the upper ones closely join at the base, appearing perforated by the shoot, and all the branches terminated by naked verticillate spikes of long, unreflexed, deep-scarlet flowers, of great beauty, but little fragrance.

This species and following varieties of it are also distinguishable by their flowers growing in whorled spikes.

Varieties of this.] Large Virginia trumpet-honeyfuckle, having large bright-scarlet flowers—minor Carolina trumpet-honeyfuckle, with smaller scarlet flowers.

These are all the principal sorts of *Lonicera* that merit culture in our gardens, and that are generally to be met with in the nurseries for sale.

The flowers of all the ten species and respective varieties are of one single, oblong, tubulous petal, it having the lower part a long tube, enlarging at top, and deeply divided into five, mostly reflexed segments (see the *Characters*); and those of most of the sorts are ornamental, but preference is due to those of the trailing kinds, and which possess also the greatest fragrance.

The plants of all the sorts are shrubby, durable in root, stem, and branches; and so hardy as to grow in any common soil and situation, both in open exposures, and under shades of trees, more particularly the trailing kinds.

They are all admirable furniture for ornamental plantations in gardens, both for the variety of their different growths, and ornament and fragrance of their flowers; though the

the flowers of the upright kinds are not so showy as those of the trailers; but they, however, exhibit an exceedingly agreeable variety. Those of the trailing species have certainly the greatest merit both in their numbers, size, elegance, and odour, as well as in duration; however, the shrubs of all the sorts are proper to be introduced as plants of ornament in every shrubbery; the upright kinds to intermix as standard shrubs, they having upright firm stems, and erect moderate-shooting branches, forming handsome heads; but the trailing kinds, whose branches are great ramblers, and, without support, trail along the ground, should generally be introduced as climbers, having stout stakes placed to each for them to climb upon, which they effect by ascending spirally round the support, to a considerable height: and may also be placed to ascend round the stems of trees, and to climb among the boughs of the adjacent bushes, shrubs, and hedges, which they will effect in a very agreeable manner, by interweaving their branches therewith, mount aloft, spread about, and show their flowers at top, appearing as if produced from the plant upon which they climb. Thus, by different orders of planting, may all the sorts of *Lonicera*, both upright growers and climbers, be made to ornament our gardens.

I should advise to disperse plenty of the different climbing *Loniceras* near the sides of all the principal walks, both for the beauty of their flowers, and for the delightful odour they constantly emit all around.

These climbers are likewise proper for training against walls and arbours, &c. for the ornament and fragrance of their flowers, training their branches four or five inches asunder; observing to thin out the superabundant shoots annually, and train in some of the most robust for succession wood, either at full length, or shortened as it may seem proper for the space designed to fill.

Having observed above, that the trailing kinds are principally adapted for climbers, I would however remark, that with a little pains they may also be made to form low bushy standards; this is done by training them at first to one upright stem, by means of stakes, and prune their rambling young shoots every year, as short as you shall see occasion, so as to keep them within proper bounds; by this practice they may be made to form tolerable standard shrubs, with erect firm stems, and bushy heads; as, however, they will still run out into long rambling shoots, these may be pruned accordingly.

The ever-green kinds of these shrubs are

principally all of the climbing tribe, and have singular merit, not only in their ever-green foliage, plenitude, and elegance of their flowers, but in their long continuance in bloom, which is frequently from June till November, and sometimes till Christmas, and after, in mild seasons; and those of the *Lonicera Caprifolium*, or Italian kind, impart a most agreeable fragrance: all of which kinds having long trailing twining branches, will form beautiful climbers; they may also be trained as standards by the means of supporting their stems at first, and stopping their young shoots as hinted above; but the Italian sort being the strongest shooter, is the best for this purpose.

As to the general culture of all the sorts, they require very little; the upright sorts in particular require to have only their straggling shoots shortened, and dead wood cut out; and the climbing kinds, which are trained as climbers, must have their branches conducted in a proper manner upon their respective supports; and every year all rambling shoots must be reduced and trained as you shall see proper, so as to preserve them within due limits and order, except you design they shall run wild in their own rural way, especially those intended to climb among the branches of trees, shrubs, and bushes; those also intended to cover arbours and seats, should be pruned and trained annually, laying the shoots along at their length, especially till they have covered the allotted space; shortening or clearing out, however, all such stragglers which cannot be properly trained; likewise such of those sorts as are trained against walls, &c. must have an annual pruning and training, by going over them two or three times in summer, laying in some of the most convenient proper shoots, some at their length, shortening or retrenching others as it shall seem necessary to preserve regularity, and the proper succession of flowers; observing, however, to train enough, at this time, of such particularly as shall appear necessary to continue the bloom as long as possible; and in winter-pruning, thin out all those left in summer, which may appear superfluous or unnecessary, and shorten all such as are too long for the space allotted for them, especially all those with weak straggling tops; and nail in the remaining proper branches and shoots close to the wall.

Propagation of all the Sorts.

The propagation of all the sorts is effected by layers and cuttings, more particularly the latter; both of which readily emit roots, and form plants in one year, fit to transplant:
some

some sorts are also propagated by suckers, and by seed.

By Layers.—In autumn, winter, or spring, lay a quantity of the lower young shoots of the former summer, by simple laying, shortening their straggling tops; they will be well rooted by autumn following, each commencing a good plant, and should be taken off and planted in nursery rows for a year or two, to acquire proper size and strength for use.

By Cuttings.—Any time from October till March is the proper time for this work, but the sooner the better; and by which method great quantities of the plants may be raised, as almost every cutting will readily grow. Chuse the young shoots of the former summer, the strongest and most robust, and which divide into cuttings from about six or eight to ten or fifteen inches long; plant them in rows in any shady border of common earth, a foot asunder, and half that distance in each row, or closer if great quantities are required, putting each cutting two parts out of three, or more, into the ground; they will take root freely without any trouble, and shoot at top, so as to form proper plants by autumn following, at which time, or in spring, they may be transplanted into the nursery quarters, to have more room to grow, placing them in rows two feet distance, and a foot apart in the rows; where let them remain a year or two, or till wanted for the shrubbery.

By Suckers.—The *Lonicera Diervilla* sends up annually abundance of spawn, or small suckers from the root, by which it may also be propagated; each of which, taken up in autumn or winter, and planted in the nursery, will form a proper plant; observing this sort is likewise propagated with great ease by layers and cuttings as above.

By Seed.—Several of the upright sorts, and others, furnish plenty of seeds, which if sown in autumn, in a bed of common mould, an inch deep, many of the plants will probably rise in spring; but a great part of them are apt to remain till the second spring before they appear.

LOPEZIA, a genus of American plants remarkable for its novelty, and the singularity of the structure of the flower.

Class and order, *Monandria Monogynia*.

Characters.] **CALYX**, a four-leaved, narrow, concave, coloured cup. **COROLLA**, four irregular petals, the two uppermost linear and jointed, the lower ones orbicular, with long narrow claws, the nectarian oval petal below the corolla, with the sides folding together, nearly upright, containing within it the pistil and stamen elastically opening. **STAMEN**,

a slender filament, topped with large antheræ. **PISTILLUM**, a round smooth germen, style slender, crowned with a capitated villous stigma. **PERICARPIUM**, a round capsule of four cells containing very small oval seeds.

There is but one species,

LOPEZIA racemosa.

Racemous Mexican Lopezia.] Hath an annual root, from which arises a stalk five or six feet high, of a deep-red colour; the branches are like the stalk, and furnished with ovate-pointed, toothed leaves, placed alternately. The flowers stand on long slender peduncles, growing irregularly on hairy, leafy racemi terminating the branches.

The great singularity of this plant is its necessary embracing within it the stamen and pistillum: on touching it ever so lightly with the point of a pin, while in this state, it suddenly springs back and quits the pistillum, and the lower elastic part bent up and down in a peculiar manner.

This plant being an annual, must be raised from seeds had from abroad: they may be sown in the spring, and kept in the stove, when there may be a chance to get ripe seeds here.

LORANTHUS, a genus of exotics for the stove, with oval leaves, and flowers growing in bunches.

Class and order, *Hexandria Monogynia*.

Characters.] **CALYX**, a concave germ beneath the flower. **COROLLA**, six oblong, revolute, equal petals. **STAMINA**, six awl-shaped filaments joined to the tops of the petals, with oblong antheræ. **PISTILLUM**, an oblong germen within or below the cup, style simple, crowned with an obtuse stigma. **PERICARPIUM**, an oblong berry, with one cell containing a single oblong seed.

There are several species of this genus, but we shall notice only one, viz.

LORANTHUS americanus.

American Loranthus.] Rises with a shrubby stem, eight or ten feet high, with several branches garnished with oval-oblong, entire leaves; the flowers come out from the ends of the branches in a racemus, and are of a bright scarlet colour; these are succeeded by oblong black berries, containing oblong seeds.

This plant is propagated by seeds sown as soon as they are ripe, otherwise they will not germinate before the next year; they should be sown in pots of rich earth and kept in a moderate hot-bed till autumn, when they must be removed into the stove and plunged in the bark-bed, and afterward managed as other stove plants of the like nature.

LOTUS, Bird's-foot Trefoil.

It consists of herbaceous and under-shrubby plants

plants for the pleasure-garden and green-house; some trailers, and some of erect growth, from one to two or three feet high, adorned mostly with trifoliate leaves, and papilionaceous ornamental flowers.

Class and order. *Diadelphia Decandria.*

Characters.] CALYX is monophyllous, five-parted at top, and permanent. COROLLA is papilionaceous, the standard roundish and reflexed backward, the wings shorter, broad and roundish, and the keel short and closed above. STAMINA, ten diadelphous filaments, and small antheræ. PISTILLUM, an oblong taper germen, a simple style, and inflexed stigma. PERICARPIUM, a close, cylindrical, bivalvular, unilocular pod, having numerous partitions separating the seeds.

The name of Bird's-foot Trefoil given to the plants of this genus, is derived from the fancied resemblance of the bended seed-pods of some of the sorts to the toes of birds' feet.

There are many species; but those common to our gardens are a hardy herbaceous annual for the pleasure-garden, and four under-shrubby perennials for the green-house.

Hardy Annual Kind.

1. LOTUS tetragonolobus.

Tetragonus Winged-podded Lotus, commonly called Winged Pea.] Hath trailing, slender, branchy stalks, a foot long; garnished with trifoliate oval leaves, accompanied by two oval bractæ at their base; and from the axillas of the branches large papilionaceous red flowers, one on each foot-stalk; succeeded by tetragonous solitary pods, having a membranous wing, or lobe, running longitudinally at each angle.

It flowers ornamentally in June and July, and the seeds ripen in autumn.

This plant is of the tribe of hardy annuals, and has been long cultivated as a flowery plant to adorn the flower-borders, &c. is generally sown in patches where the plants are to remain.

Tender Green-house Kinds.

These kinds are perennial in root, and mostly with durable stalks; are natives of distant warm countries, and require protection here from frost, so must be kept in pots, and placed among the green-house plants.

The sorts are,

2. LOTUS creticus.

Cretan Silvery Lotus.] Hath a slender under-shrubby stalk, rising by support three or four feet high; ornamented with trifoliate bright-silvery leaves; and from the sides of the branches long foot-stalks, each terminated by several yellow flowers, succeeded by subternate pods.

3. LOTUS Jacobæus.

Lotus of St. James's Island.] Hath upright herbaceous stalks, branching two or three feet high; adorned with narrow, spear-shaped, close-fitting, whitish leaves, sometimes are trifoliate, and quinquefoliate; and from the upper part of the branches long slender foot-stalks, terminated each by three or five yellowish-purple flowers, succeeded by subternate pods.

It flowers most part of summer and autumn, succeeded by plenty of seeds.

4. LOTUS hirsutus.

Hairy Italian Lotus.] Hath upright hairy stalks, branching a yard high; garnished with trifoliate hoary leaves; and from the sides of the branches longish foot-stalks, terminated by heads of whitish hoary-cupped flowers, succeeded by oval pods; flowers in June, and the seeds ripen in autumn.

5. LOTUS Dorycnium.

(Dorycnium)—or White Austrian Lotus.] Hath under-shrubby smooth stalks, branching three or four feet high; five-lobed, hand-shaped, hoary leaves; and the branches terminated by aphyllous heads of small white flowers, succeeded by short pods; flowers in June.

The flowers of all these five species of Lotus are of the papilionaceous or butterfly-shaped kind, composed each of four petals, i. e. a vexillum, two wings, and a carina. See the *Characters.*

The first species being a hardy annual of the flowery kind, is proper for ornamenting the compartments of the pleasure-garden. It is raised from seed annually in spring, in the open ground, in the places where the plants are to remain to flower. Sow it any time in spring, from February till May, in patches in different parts of the garden, five or six seeds in each patch, half an inch deep; the plants will soon come up, which remaining in the same place for flowering, require only occasional weeding, and may either be suffered to trail, according to their natural growth, or may tie them up to sticks; they will flower equally well in either method, exhibiting their crimson flowers very ornamentally.

This plant was formerly cultivated as an esculent, for its young green seed-pods to dress and eat like peas, also in the manner of kidney-beans.

The green-house kinds effect an agreeable variety in that collection, both in their foliage and flowers. They all require shelter from frost, the two first of them in particular; but the two last are somewhat hardier, and will sometimes succeed in the full ground

all

all the year in a warm and dry situation, so may place some to take their chance; it, however, is proper to keep some of all the sorts in pots of rich earth, in order for moving to shelter in winter.

The propagation of these green-house sorts is by seed and by cuttings.

By Seed.—Sow it in April in a warm border; or, to bring them more forward, in a moderate hot-bed; and when the plants are about three inches high, plant them in separate small pots of light rich earth, give water, and place them in the shade till fresh-rooted.

By Cuttings.—Cuttings of the young stalks and branches, planted any time from April till July, in beds or pots of rich mould, giving shade and water, they will emit roots, and form plants in a few weeks, but may be greatly facilitated by covering them close with hand-glasses till they begin to shoot at top; then inure them gradually to the air, and soon after may be transplanted into separate pots.

LUNARIA, Moon-wort, Satin-flower, or Honesty.

The plants are tall, herbaceous, ornamental annuals and perennials, of upright branchy growth, for the pleasure-garden, rising two or three feet high, garnished with heart-shaped and oval-lanceolate leaves, and clusters and spikes of tetrapetalous cruciform flowers, succeeded by broad, roundish, moon-shaped, flat, very thin, pellucid pods, whitish, and satiny-shining, so transparent as to discover the seed through them, hence it is commonly called Honesty.

Class and order, *Tetradynamia Siliculosa*.

Characters.] CALYX, four oblong-oval deciduous leaves. COROLLA, four large, obtuse, cruciform petals. STAMINA, four long and two shorter filaments, and erect, patent antheræ. PISTILLUM, a pedicellated oval-oblong germen, very short style, and an obtuse entire stigma. PERICARPIUM, a large, elliptical, plane, compressed, very thin, bilocular pod, erected on a small foot-stalk, containing kidney-shaped, compressed, bordered seeds.

There are but two species, an annual and perennial, the former of which has been long a resident of our gardens, commonly known by the name of Honesty.

The species are,

1. LUNARIA annua.

Annual Moon-wort, commonly called Satin-flower, or Honesty.] Hath fibry roots, crowned by large heart-shaped leaves; amidst them an upright reddish flower-stalk, branching all around, a yard high, adorned with heart-shaped leaves, opposite below and sitting close

above; and from the sides and ends of all the branches, clusters of cruciform purple flowers, succeeded by numerous, broad, moon-shaped, white satiny, pellucid pods.

Variety.] Large-podded satin-flower, or honesty.

Both the varieties flower in May or June, and their pods and seed ripen in autumn; the seed-pods being numerous, white, satin-like, and transparent, exhibit a singularly agreeable appearance; and as they remain long on the branches, the stalks are often cut off in September, and dried, then tied in spreading bunches, to place in large rooms all winter, where they will appear very ornamental; more especially if the pods are divested of their outer husks, they will be whiter, more satiny and shining.

2. LUNARIA rediviva.

Redivive Sweet-scented Moon-wort.] Hath fibrated perennial roots; upright, firm, tough stalks, branching two feet high; garnished with oval-spear-shaped, rough leaves, placed alternate above; and the branches terminated by spikes of sweet-scented flowers, of different colours in the varieties; succeeded by oblong flat pods.

Varieties.] With purple flowers—with white flowers—and with yellow flowers; all flowering in June, succeeded by pods and ripe seeds in autumn, having the same property as the former.

The flowers of both the species and respective varieties are cruciform, and consist each of four heart-shaped petals, are numerous on each plant and conspicuous.

Both the species and their varieties are very hardy, and will grow any where; the first sort decays annually after having flowered and seeded; but the perennial is of several years' duration in root, especially if cultivated in a dry, sandy, or rubbishy soil.

The first species, *Lunaria annua*, however, may be considered both as an annual and biennial; for, as an annual, being sown early in spring, it will come up the same season, and often run up to flower, perfect seeds, and wholly perish in autumn; and as a biennial, if sown in summer, or early in autumn, it will rise the same year, stand the winter, flower early in summer, perfect seeds in autumn, and then totally perish; for, considered either as annual or biennial, it always decays root and branch soon after the seeds are ripe; remarking that the autumn-sown plants always grow strongest; and from scattered or self-sown seeds, numbers of young plants will rise spontaneously.

But as to the second sort, it being once

raised, it remains perennial in root, sending up fresh stalks annually in spring for flowering, which always decay as soon as they have perfected seeds.

The propagation of both the species, &c. is by seed, in the natural ground in autumn or spring, either in patches to remain, or in beds for transplantation. By the former method the plants are generally stronger than those which are transplanted; but they succeed very well both ways; observing, when designed to sow them in patches, to put several seeds in each, half an inch deep, and when the plants come up, leave only one of the best in each patch; and if intended to sow any for transplantation, sow them evenly on any bed or border, and rake them in; and when the plants are two or three inches high plant them out, the annual sorts where they are finally to remain to flower, and the perennials either where they are to remain, or in nursery beds till autumn, then to be planted out for good.

LUPINUS, Lupine.

This genus consists of hardy, herbaceous, flowery annuals, and a perennial, all for the pleasure-garden, rising with upright stalks, from about a foot to three or four high; ornamented with digitate or fingered leaves, and terminated by long whorled spikes of papilionaceous flowers.

Class and order, *Diadelphia Decandria*.

Characters.] CALYX is monophyllous and bifid. COROLLA is papilionaceous, the vexillum roundish-cordated, emarginated, with the sides reflexed and compressed, the wings nearly oval, and join at their base, and a narrow, falcated, acuminate carina. STAMINA, ten diadelphous filaments, and roundish-oblong antheræ. PISTILLUM, an awl-shaped compressed germen, subulated style, and obtuse stigma. PERICARPIUM, a large, oblong, compressed, acuminate, coriaceous, unilocular pod, containing several roundish compressed seeds.

There are about seven species, six annuals and one perennial, all hardy, and mostly plants of ornament, both in their finely digitate leaves, and variety of their flowers.

Annual Kinds.

Of these kinds there are about four or five species common to our gardens; have all fibrated roots, each plant rising with one upright branchy stalk, as in their description.

1. LUPINUS *luteus*.

Yellow Lupine.] Rises with an upright stalk, branching a foot or eighteen inches high; garnished with digitate leaves, of eight or nine long narrow lobes; and the stalks and branches terminated by loose whorled spikes of yellow

flowers, having verticillate cups with appendages, the upper lip bipartite, and the under one tridented; flowers in June and July.

The flowers of this have a sweet fragrance, for which peculiar merit it is in great estimation.

2. LUPINUS *hirsutus*.

Hairy Giant Lupine.] Rises with an upright, thick, downy, hairy stalk, branching strongly two to three or four feet high; garnished with digitate hairy leaves, of from nine to eleven oblong, wedge-shaped, silvery-white lobes; and the stalk and branches terminated by long whorled spikes of large flowers, of different colours in the varieties, having alternate cups with appendages, the upper lip bipartite, the under one tridented.

Varieties.] With blue flowers—with flesh-coloured flowers, commonly called Rose Lupine. The flowers of both varieties are large and showy, appear in July, and are succeeded by large, broad, hoary seed-pods.

3. LUPINUS *angustifolius*.

Narrow-leaved Tall Blue Lupine.] Rises with an upright firm stalk, branching a yard high; digitate large leaves, of nine or ten oblong, obtuse, bluish lobes; and the stalks and branches terminated by whorled spikes of blue flowers, having alternate cups with appendages, the upper lip bipartite, and the under entire; flowers in July.

4. LUPINUS *varius*.

Variegated-seeded Blue Lupine.] Rises with an upright firm stalk, two feet and a half high; digitate leaves, of six or seven oblong hairy lobes, and the stalk and branches terminated by spikes of blue flowers, having semi-verticillate cups with appendages, the upper-lip bifid, and the under almost tridented; and with variegated seed.

5. LUPINUS *albus*.

White Lupine.] Rises with an upright thick stalk, branching two feet high; digitate leaves of seven or eight narrow hairy lobes, covered with a silvery down; and the branches ending in loose spikes of white flowers, having alternate cups without appendages, the upper lip entire, and the under tridented.

All these annual Lupines rise from seed sown annually in spring and summer in the open ground, arrive to full growth in June and July, when they flower, and ripen seed abundantly in autumn; then the plants totally perish root and branch.

They are all very ornamental in the pleasure-garden, but the yellow sort claims precedence for the sweetness of its flower.

Perennial Kind.

There is but one sort; it is perennial in root, and annual in stalk.

6. LUPINUS

6. LUPINUS perennis.

Perennial Blue Virginia Lupine.] Hath long fibrated, creeping, deeply penetrating roots; upright channeled stalks, branching near two feet high; digitate leaves of eight or ten spear-shaped narrow lobes; and the branches terminated by loose spikes of blue flowers, having alternate cups, without appendages, the upper lip emarginated, and the under one entire; flowers in June.

All the species flower in June and July, and ripen plenty of seeds in autumn.

The flowers of all the sorts are papilionaceous, consisting of four petals, that is, a standard, two wings, and carina (see the *Characters*), and grow in erect spikes, often disposed in whorls one above another; which, in all the sorts, are succeeded by oblong, compressed, leguminous pods, containing from three to five or six roundish flat seeds.

The leaves of all these plants are beautifully digitated into many lobes, stand mostly upon long foot-stalks, and exhibit an agreeable variety.

The plants of all the sorts succeed in any of the open borders, &c. and effect a fine variety, as well as very ornamental appearance; and are all easily raised from seed, which should generally be disposed in small patches in the different flower compartments, in the places where it is designed the plants shall flower; placing some more forward, and others backward, according to their order of growth; or some may be sown in drills in beds, or the yellow Lupine also in a drill along the edge of a border, and some sown in pots, observing the annuals must be raised every year, as they always perish soon after they have flowered and ripened seeds; but the perennial sort, once raised, is of several years' duration.

Propagation, &c. of all the Sorts.

The propagation of all the sorts is effected with the utmost facility by seed in the full ground in March, April, and May; observing, that as too copious moisture is apt to rot the seed, they should not be sown earlier than the middle or latter end of March, except on very dry warm soils.

The annual sorts should always be sown at once in the places where it is intended the plants are to flower, for they do not succeed by transplantation; and to have a long succession of bloom, about three different sowings may be necessary, from about the middle or latter end of March until June, especially the yellow sort, whose bloom is rather of short duration; observing to sow all the sorts in patches, four, five, or six seeds in each, near

an inch deep; and when the plants come up, leave only three of the best of them, though of the large kind one or two may be sufficient in each place. When large quantities are required for nosegays, to supply the markets, &c. as practised about London with the yellow sweet-scented sort, they may be sown in rows in beds, drilling them in an inch deep, allowing a foot between the rows. In either mode of sowing all the sorts, let the plants remain in the same place for flowering, as above mentioned, and keep them clean from weeds; which is all the culture they require; and by repeated sowings at a month's interval, till June, the bloom may be continued from June or July until September or October; and the first sown plants will furnish plenty of ripe seed.

Sometimes small portions are sown in autumn, in September, in a warm dry border of light earth, and the plants generally coming up the same season, stand the winter for flowering early next summer; or more effectually if sown in pots, and placed in garden frames in winter, to have occasional protection from frost; and this latter would be eligible in the large blue and rose Lupine, which, in wet cold autumns, ripen seed but indifferently; so by having protection of a frame as above, would flower early, and perfect their seeds before attacked by the autumnal rains.

The perennial sort may be sown either in patches in the different compartments, as already observed, for the plants to remain where sown; or may be sown in beds in drills, for transplantation; but as the plants generally send their roots deep into the ground, they commonly succeed better when permitted to remain where raised, than by removal; however, both methods may be practised occasionally; and the plants once raised remain durable in root many years, sending up new stalks annually in spring.

LUXURIANS, Luxuriant Plants, &c.

These are such as are greatly augmented in growth beyond their common natural state; and it is observable of such plants, &c. for the general part, that they rarely acquire that degree of perfection as plants of more moderate growth; and which state of Luxuriance sometimes happens through the excess of nourishment, and sometimes by the nature of some particular plants.

But Luxuriance operates differently; it prevails sometimes in the whole plant, sometimes in particular parts of a plant, as in some of the shoots, and frequently in the flowers. We shall therefore consider them under these three

heads: 1. Luxuriant Plants—2. Luxuriant Shoots—3. Luxuriant Flowers.

1. Luxuriant Plants and Trees.—These, as above observed, are such as shoot considerably stronger than plants of the same species generally do, and is applicable both to herbaceous plants and trees, &c. and that very Luxuriant Plants and Trees never attain perfection so soon as moderate growers: as, for example, many sorts of esculent plants which shoot luxuriantly to leaves and stalks, &c. such as cucumbers, melons, cabbage, cauliflowers, turneps, radishes, beans, peas, &c. never arrive so soon to perfection as those of moderate growth; and such plants as appear to be naturally of themselves of a very Luxuriant nature, are very improper to stand, from which to have seed for propagation.

The same is also observable of fruit-trees; for such as are very Luxuriant shooters are much longer before they attain a bearing state, than those of middling growth; nor do they ever bear so plentifully, nor the fruit attain such perfection as in moderate-shooting trees: this Luxuriance happens sometimes through excess of nourishment, as before observed, and sometimes is the nature of the tree, and very frequently is acquired by unskillful pruning, especially in wall-trees, &c. for it is very often the practice of some pruners, when wall or espalier trees assume a Luxuriant growth, to cut all the shoots short; by which practice, instead of reducing the tree to a moderate state of shooting, has increased its vigour, because, as we have before occasionally observed, too considerable shortening of strong shoots promotes their throwing out still stronger, and producing more abundant or superfluous wood.

Therefore, in pruning very Luxuriant espalier and wall-fruit trees, assist them somewhat in their own way, as it were, by training in plenty of shoots annually for a year or two, to divide the redundancy of sap; that is, in training in the necessary supply of shoots, both in the summer and winter pruning, always leave them rather thicker than in the common practice, and mostly at full length, unless it shall seem necessary to shorten any which are of very considerable length, or others, in some particular part of the tree, to force out a supply of wood to fill a vacancy; observing that some sorts of fruit-trees should never be generally shortened in the common course of pruning, or only in casual very extended, or particular irregular growths, or sometimes occasionally for the purpose of procuring a supply of wood as just mentioned; which is particularly to be remarked in apples, pears,

plums, cherries, figs, &c. for if general shortening was to be practised to these sorts, they would continue shooting every year so luxuriantly to wood, that they would never form themselves into a proper bearing state: even in those trees where shortening is necessarily practised in winter to most of the annual supply of shoots, as in peaches, nectarines, &c. it, in cases of Luxuriant growth, should be very sparingly performed, that is, not to cut the general shoots very short, and some of the most vigorous leave almost or quite at full length.

This is the only method to reduce a Luxuriant tree to a moderate growth, and to a bearing state; for by training the shoots thicker, and leaving them longer, and continuing it for a year or two, the redundant sap consequently having greater scope to divide itself, it cannot break out with that Luxuriance, as when it has not half the quantity of wood to supply with nourishment, as in the case of pruning short; and by practising the above hints, a Luxuriant tree may in two years be brought to a moderate growth, and become a good bearer. See ESPALIERS, WALL-TREES, PRUNING, &c.

Luxuriance seldom occurs with any continuance in standard-trees where permitted to take their natural growth, except some casual straggling shoots, which should always be taken out by the rules mentioned in the following articles.

2. Luxuriant Shoots.—These are applicable principally to trees and shrubs; but are more particularly to be attended to in the culture of the fruit-tree kind, and especially those of wall and espalier trees which undergo the discipline of an annual pruning; Luxuriant shoots, therefore, are frequently mentioned in the culture of the several sorts of fruit-trees, and in that of others occasionally.

However, Luxuriant shoots are such which shoot so vigorously in length and substance, as greatly to exceed the general growth of those usually produced on the same kind of plant or tree, and are sometimes general, and sometimes only happens to particular shoots in different parts of a tree, &c. and those shoots denominated Luxuriant, are discoverable by their extraordinary length and thickness, and by their vigour of growth, which always greatly impoverishes the other more moderate shoots in their neighbourhood, and likewise the fruit, &c. as well as often occasions a very irregular growth in the respective trees; and such shoots very frequently occur in wall and espalier fruit-trees, by the effects of pruning. When they are in general

ral so, that is, all or most of the shoots of an espalier or wall-tree are Luxuriant, manage them as above directed in treating of Luxuriant trees; but when luxuriance happens to particular shoots here and there in a fruit-tree, or indeed any other tree or shrub under training, that such shoots being both of such a very Luxuriant nature as to draw the nourishment, or sap at the expense of all the adjacent moderate shoots on the same tree, and often by its vigorous irregular growth, cannot be trained with any degree of regularity; so that considering these disadvantages of straggling Luxuriant shoots, they should for the most part, as soon as discoverable, in summer or winter pruning, be cut out, taking them off as close as possible to the part of the branch from whence they originate, that no eye may be left to shoot again; unless, however, such a shoot shall rise in any part of a tree or shrub, where a further supply of wood may be requisite; in which case it may be retained, and shortened as it shall seem convenient to force out a supply of more shoots laterally to fill the vacancy.

But, as above noticed, where a wall or espalier tree is wholly of a Luxuriant nature, producing almost in general Luxuriant shoots, leave them thicker, or more abundant, and train them along mostly at full length, and by thus leaving a larger supply of wood for the sap to divide itself, the tree in two seasons will be reduced to a more proper growth; when it may afterwards be managed according to the general rules.

As Luxuriance also casually prevails in most other trees and shrubs, they should have occasional attention, on that occurrence, to prune them to some regular order, especially in their younger advancing growth, or afterwards occasionally in some particular sorts, as it may seem necessary: so as, in either of which, when any straggling shoots, &c. assume a very Luxuriant rambling growth, greatly exceeding the other general branches, the Luxuriance should be either more or less reduced to some regulation, or cut entirely away close to its origin, as may seem most expedient, according to the nature of growth of the trees or shrubs in which it happens to occur, either in summer or winter, &c.

3. Luxuriant Flowers.—All double flowers may be considered as Luxuriant, especially such which have either the cup or corolla multiplied, or so augmented in the number of their leaves, or flower petals, inward, as to exclude some part of the fructification, for the same is observable in flowers as in esculent plants and fruit-trees, that Luxuriance,

though in a different way, tends to their imperfection in the original intention of nature; the flower being designed for perfecting the fruit and seed; but when the petals are multiplied to the diminution of the stamina, &c. so that no impregnation ensues, no fruit or seed can be produced, consequently, by the Luxuriant augmentation of the corolla, plants often become barren.

Luxuriance in flowers, however, in the double varieties of most kinds produced on what may be deemed ornamental-flowering plants, is in many sorts generally considered as a superior degree of perfection; and consists of three modifications. First, such double flowers as have the petals multiplied, yet do not entirely exclude the stamina. Secondly, such in which, by the multiplicity of the petals, all the stamina are excluded, so that no impregnation can be effected. Thirdly, such flowers as produce one out of another, as in the prolific anemone, &c.

But Luxuriant flowers which do not exclude all their stamina, are capable of impregnation, and consequently produce seed.

The highest degree of luxuriance is often observable in carnations, anemones, ranunculuses, poppy, lychnis, peony, narcissus, violet, &c.

LYCHNIS, *Lychnis*, or *Campion*, including also the Bachelor's-button, Catch-fly, &c.

It consists of hardy, herbaceous, very floriferous ornamental perennials, of upright growth for the pleasure-garden, and one for the green-house; all rising with erect firm stalks, two or three feet high, adorned at each joint with long spear-pointed leaves; and all the stalks terminated by clusters and spikes of quinquepetalous, very conspicuous flowers, of different colours in the different species and varieties.

Class and order, *Decandria Pentagynia*.

Characters.] CALYX is monophyllous, tubulous, five-parted at top, and permanent. COROLLA, five petals, having long tails, or ungues, the upper part or limb broad plane, and in some cut into segments. STAMINA, ten long filaments, alternately arranged, and attached to the ungues of the petals, and incumbent antheræ. PISTILLUM, a suboval germen, five long styles, and reflexed downy stigmas. PERICARPIMUM, an oval, unilocular, quinquevalvular, covered capsule, having numerous roundish seeds.

There are about five species, that have merit as garden-plants, viz. the scarlet *Lychnis*—Bachelor's-button—Catch-fly—Ragged Robin; each comprising some varieties—and the Chinese *Lychnis*.

The

The species are;

1. *LYCHNIS chalcedonica.*

Chalcedonian Lychnis Major, or Scarlet Lychnis.] Hath a fibrated perennial root; upright, straight, hairy, annual stalks, rising two to three or four feet high; garnished with long, spear-pointed, close-fitting leaves, by pairs opposite; and the stalk crowned by a large, compact, flat-topped bunch of scarlet or flame-coloured flowers, in June and July.

Varieties.] With single scarlet flowers—with large double scarlet flowers, of exceeding beauty and elegance—with pale-red flowers—with white flowers.

Of these varieties of this species, the double scarlet *Lychnis* is superior for size and elegance, the flowers being large, very double, and collected into a very large bunch, and exhibit a charming appearance; the single scarlet kind is also very pretty; and the others effect an agreeable variety with the scarlet kinds. All the singles furnish plenty of seed, by which they may be raised abundantly; but the double, by its multiplicity of petals, excluding the generative organs, rarely ever produce seed, so can only be propagated by slipping the roots, and by cuttings of its flower stalks. See the *Propagation*.

2. *LYCHNIS diaea.*

Diaecous Lychnis, commonly called Bachelor's-button.] Hath fibrated perennial roots; upright stalks, branching very diffuse and irregular, two or three feet high; having oval, acute-pointed, rough leaves, by pairs opposite; and all the branches terminated by clusters of dioecious flowers of different colours and properties in the varieties; flowering in April and May.

Varieties.] Common single red-flowered Bachelor's-button—double red—double white—and single white-flowered.

The double varieties are exceedingly ornamental in their bloom; the flowers large, very double, and continue long in blow; the single red sort grows wild by ditch sides, and other moist places in many parts of England; from which the doubles were accidentally obtained by culture in gardens, and are propagated only by slipping the roots; and the singles, both by roots and by seed.

The flowers are often dioecious, i. e. male and female on distinct plants.

3. *LYCHNIS viscaria.*

Viscous, or Clammy Lychnis, commonly called Catch-fly.] Hath fibry perennial roots, crowned by a tuft of long, grassy leaves close to the ground; many erect, straight, single stalks, rising a foot and a half or two feet high, exuding from their upper part a viscous

or clammy matter; garnished with long narrow leaves, by pairs opposite; and terminated by many reddish-purple flowers, in clusters one above another, forming a sort of long loose spike; all the flowers with entire petals; flowering in May.

Varieties.] With single red flowers—with double red flowers—with white flowers.

The double variety is considerably the most eligible for general culture, and is propagated in plenty by parting the roots.

All the varieties of this species emitting a glutinous liquid matter from their stalks, and flies happening to light thereon, sometimes stick and entangle themselves, the plant thereby obtained the name *Catch-fly*.

4. *LYCHNIS Flos-cuculi.*

Cuckoo-flower Lychnis, or Meadow Pink, commonly called Ragged Robin.] Hath fibry perennial roots; upright, branchlets, channelled stalks, rising near two feet high; garnished with long, narrow, spear-shaped leaves, in pairs opposite; and terminated by branchy foot-stalks, sustaining many purple, deeply quadrifid flowers; appearing in May.

This species, in its single state, growing wild in this country, and the flowers having each petal deeply quadrifid in a torn or ragged-like manner, the plant obtained the rustic name of *Ragged Robin*.

Varieties.] With single flowers—double flowers. The double sort is a large, very multiple, fair flower; is an improved variety of the single, which grows wild in most of our moist meadows, and is rarely cultivated; but the double, being very ornamental, merits culture in every garden; it, like the other double *Lychnises*, rarely produces seed, but is easily propagated by slipping the roots.

5. *LYCHNIS coronata.*

Coronate-flowered, Chinese Lychnis.] Hath a fibrous, perennial root, upright annual stalks, rising about two feet high, garnished with smooth, oval, spear-pointed leaves, by pairs opposite, sitting close to the stem; the flowers are large, and come out singly on foot-stalks, arising from the axillas of the leaves, they are of a rich orange colour, and crenated unequally on their edges.

Of the above, the first four species and respective varieties are very hardy; all fibrous-rooted, the roots perennial; but are annual in stalk, which rising in spring, flowers in summer, succeeded in the singles by plenty of seed in autumn; by which all the single varieties may be raised in abundance, but the doubles only by dividing the roots, and some by cuttings of the flower-stalks.

The flowers of most of the sorts, considered

ed separately, are smallish, but their numbers on each plant render them conspicuous; each flower, in its single state, is composed of five plane petals (see the *Characters*); but in the doubles, the petals are numerous; the singles succeeded by plenty of seed, but the doubles rarely any.

All these plants are very ornamental furniture for the pleasure-garden, particularly the doubles, and will prosper in any common soil, to remain in all weathers unhurt, and each individual be of many years' duration in root; which, when of some standing, send up many stalks every spring, and which being all terminated by numerous flowers, make a fine appearance in summer; but the scarlet *Lychnis* claims preference, especially the double kind, which is singularly beautiful; even the single scarlet sort is also very showy and pretty, and by some preferred to the double; all the other species, however, in their respective double-flowered states, are pretty ornaments for the principal compartments of the pleasure-ground.

All the sorts are kept in the nurseries for sale; and having a few plants of each, may soon increase the stock.

They may be planted any time from October till March or April, in open weather; though if in autumn, or early part of spring, will flower stronger accordingly in their proper season; observing to place the tallest growers the most backward, the others more toward the front, according to their several degrees of height.

All the culture they require, is the clearing them from weeds in summer, in common with the other plants of the same compartments; supporting with stakes the stalks of those which shall need it, and cutting down the decayed stalks in autumn.

The fifth species being similar in its nature of growth to the other four sorts, succeed by the same mode of culture in planting and propagation, only as being rather tenderish, some should be mostly planted in pots, in order for moving under protection of a frame or greenhouse in winter.

Propagation of all the Sorts.

The propagation of all the sorts is exceeding easy; all the singles by seed, and parting the roots; and the doubles by dividing or slipping the roots only, sometimes also by cuttings of their stalks; all performed in the full ground.

By Seed.—The singles may be raised in great plenty this way, though but few of them, except the single scarlet *Lychnis*, are worth raising, since the doubles may be so easily

increased by slipping the roots, &c. March or April is the proper time for sowing, chusing a bed or border of light earth, which being dug, sow the seeds on the surface, each sort separate, and rake them in, or cover them in lightly with earth; or may be sown in small drills; the plants will come up in two or three weeks: give occasional waterings and hand-weeding; and in June or July, when the plants are two or three inches high, plant them out in beds or borders, in rows six inches asunder; water them till fresh-rooted, and let them remain till October, or following spring, then transplant them where they are to remain, and they will all flower the following summer.

By Slipping the Roots.—All the sorts, both single and double, may be propagated by this method; but is more particularly applicable to the doubles, because they cannot with certainty be obtained from seed; the best season for performing this work is autumn, after the stalks decay; it, however, may also be done in the spring: the double scarlet *Lychnis* affords off-sets the most sparing of any; all the others afford plenty; as to the method of slipping them, the whole root may either be taken up and divided into as many slips as are furnished with proper root-fibres, or the main root may stand, and slip off as many of the outer off-sets as shall seem convenient; if the slips taken off in either method are tolerably strong, the best of them may be planted at once where they are to remain; but if rather small and weak, it is the most eligible to plant them in nursery-rows, half a foot asunder, to remain a year, then transplanted for good.

By Cuttings of the Stalks.—This is more particularly necessary for the double scarlet *Lychnis*, when it increases but sparingly by off-sets of the root. The work is performed in summer, when the stalks are well advanced in growth, but before they flower, or have become hard and woody: cut some of them off close to the bottom, and divide them into lengths of from three to five joints, and plant them in an easterly border of rich earth, inserting them two parts of three, or more, into the ground, leaving only one joint out; give water directly, and repeat it, together with occasional shade in hot weather, and they will be well rooted, and form proper plants fit to transplant in autumn.

If the above cuttings, as soon as planted, are covered down close with hand-glasses, it will greatly promote their rooting, so as to form stronger plants before winter.

LYCIUM, Box-horn.

This genus retains three or four shrubby exotics

exotics of Africa, &c. for the green-house and shrubbery, rising from about six or eight to ten feet high, armed with spines, and adorned with small entire leaves, and monopetalous infundibuliform flowers.

Class and order, *Pentandria Monogynia*.

Characters.] CALYX is small, obtuse, erect, five-parted, and permanent. COROLLA, one funnel-shaped petal, having a cylindric incurved tube, divided above into five small segments. STAMINA, five short subulate filaments, and erect antheræ. PISTILLUM, a roundish germen, simple style longer than the stamina, and thick bifid stigma. PERICARPUM, a roundish bilocular berry, and numerous reniform seeds.

The species known in our gardens are,

1. *LYCIUM afrum*.

African Box-thorn.] Hath shrubby irregular stalks, branching nine or ten feet high, the branches whitish, crooked, knotty, and armed with long sharp spines; numerous small linear leaves in clusters, of different sizes in each cluster, the smaller standing at the base of the larger; and purple flowers on short foot-stalks from the sides of the branches.

2. *LYCIUM barbarum*.

Barbary Box-thorn.] Hath shrubby stalks, branching irregularly six or seven feet high, the branches whitish, and armed with thorns; small, spear-shaped, thick, whitish leaves, placed irregularly; and small white flowers from the sides of the branches, having bifid cups; flowering in June.

Of this species are the two following varieties, both shrubby trailers, of hardy temperature; they were formerly considered as distinct species, but observation has determined them to be varieties only of the above species, *Lycium barbarum*.

(Latifolium) Broad-leaved Barbary Lycium.] Hath shrubby, declinated, very diffused stalks, and branches of trailing growth, advancing irregularly many feet in length, spread about every way, and armed with very long thorns; larger, oval-spear-shaped, thick, whitish-green leaves, growing on all sides by threes; and purplish flowers, singly on short foot-stalks from the sides of the branches, having bifid cups; flowering from August till October.

(Angustifolium) Narrow-leaved Barbary Lycium.] Hath shrubby, very branchy stalks, of trailing growth, spreading irregularly every way, armed with short thorns; long, lanceolate, narrow, alternate, whitish-green leaves; and small flowers, having bifid cups; flowering in June and July.

The flowers of all the sorts consists of one funnel-shaped petal, with an incurved tube,

divided above into five parts; see the *Characters*.

All the sorts are durable in root, stem, and branches, and both the species are ever-green, retaining their leaves all the year; and they all flower here annually in summer.

The two parent species being somewhat tender, require protection from frost, so some should be kept principally in pots, and placed among the green-house plants, where, as being closely garnished with numerous small foliage, they will effect an eligible variety in that collection; some of them may also be placed in a warm part of the shrubbery to take their chance, and will succeed tolerably, except in very severe winters.

But the two trailing varieties of the *Lycium barbarum* are hardy, succeed in the open ground the year round, and are proper for the shrubbery, to introduce as trailers or climbers, for their branches trail and ramble about every way, so should have support of stakes, &c. to train them upon.

They all succeed in any common earth of a garden; let the green-house sorts, however, be potted in light, rich, loamy mould, if possible.

Propagation.

The propagation of all the sorts is by seed, layers, and cuttings; but as they all grow freely by the two latter methods, raising from seed is almost unnecessary, especially to the two hardy varieties.

By Seed.—This is sometimes practised for the green-house kinds; sow the seed in autumn in pots, an inch deep, which in winter place in a frame, &c. to have shelter from frost, but to enjoy the full air in open weather; and in spring plunge them in a moderate hot-bed; it will soon bring up the plants; when they are about three inches high, plant them in separate pots, give water, and place them in the shade till fresh-rooted, and repeat the waterings as there shall be occasion.

By Layers.—In spring lay a quantity of the young branches, by simple or common laying; they will readily emit roots, and be proper for transplanting in autumn.

By Cuttings.—In March or April plant cuttings of the young shoots of the green-house kinds in pots, and plunge them in a shady border, give water in hot weather, and they will readily grow; or if, any time from April till the end of June, young cuttings are planted in a shady border, they will emit roots, and form plants fit to be potted in autumn; but cuttings of the two hardy varieties

ties, planted at almost any time of the year, will readily grow, though from October till March is the best time, and they will form good plants by autumn following.

LYSIMACHIA, Loose-strife.

The plants are hardy herbaceous perennials and biennials, &c. of upright growth, mostly for the pleasure-garden, rising with erect stalks, from about half a yard to two or three feet high; garnished with narrow, entire leaves: and terminated by spikes, and clusters of monopetalous, rotated, five-parted, spreading flowers.

Class and order, *Pentandria Monogynia*.

Characters.] **CALYX** is erect, acutely five-parted, and permanent. **COROLLA** is monopetalous, rotaceous, and deeply divided into five flat, open-spreading segments. **STAMINA**, five subulate filaments, and acuminate antheræ. **PISTILLUM**, a round germen, filiform style, and obtuse stigma. **PERICARPIUM**, a globular, decemvalvular, unilocular capsule, having many angular seeds.

There are many species, but not more than four or five commonly retained in gardens, and those mostly perennials; all the sorts having fibrated roots, sending up stalks annually.

The species are,

1. **LYSIMACHIA vulgaris.**

Common Great Yellow Loose-strife.] Hath a thick, creeping, widely-spreading, reddish root; upright firm stalks, three or four feet high; garnished with spear-shaped, pointed, sessile leaves, by threes or fours; and each stalk dividing at top into several foot-stalks, each of those terminated by a racemous cluster of elegant yellow flowers, in June and July.

This inhabits ditch-sides and moist places in many parts of England; but being a tall, fine, showy plant in bloom, it is admitted into large gardens for the variety of its flowers.

2. **LYSIMACHIA ciliata.**

Ciliated Canadian Yellow Loose-strife.] Hath a creeping, fast spreading root; many upright stalks, rising two feet high; oval-lanceolate, smooth, opposite leaves; having ciliated foot-stalks; and from the upper axillas, long slender foot-stalks, each sustaining one yellow flower, in June and July.

3. **LYSIMACHIA Nummularia.**

Nummularia, Yellow Money-wort, or Herb Two-pence.] Hath a small, creeping, spreading root; numerous, weak, trailing, rooting stalks; small, nearly heart-shaped, smooth, opposite leaves; and from the axillas, long,

slender foot-stalks, each having a solitary yellow flower, in June and July.

It grows naturally in moist shady places in England, but is cultivated in many gardens for variety.

4. **LYSIMACHIA salicifolia.**

Willow-leaved white Spanish Loose-strife.]

Grows three feet high, having spear-shaped, narrow leaves, and the stalks terminated by long loose spikes of fine white flowers, in June.

5. **LYSIMACHIA striata.**

Straight bulb-bearing Loose-strife.] Grows with a smooth, erect, four-cornered stalk, about three feet high, having entire, spear-shaped, sessile leaves, placed opposite, and the stalks terminated by long spikes of yellow, red-spotted flowers, which, instead of producing seeds, are succeeded by small bulbs sitting on the axæ of the leaves.

The flowers of all these plants are each of one rotaceous or wheel-shaped, deeply five-parted petal, are very numerous on each plant, tolerably conspicuous, and are succeeded by ripe seeds in autumn, except the ciliated kind, which rarely produce seeds in England.

All the plants are perennial in root, and annual in stalk, and all of them multiply exceedingly by their creeping roots.

They are all very hardy, prosper in any common soil and situation in a garden, but delight most in somewhat shady moist places; they, however, may be planted any where to form variety, and their roots will abide for years, and increase greatly so as to send up many stalks, and exhibit a very showy bloom.

They may be planted any time from October till March, and their culture is only the keeping them clear from weeds, and cutting down their decayed stalks in autumn, like other herbaceous perennials; and when the roots have spread too much, trim them in all around within due bounds.

Propagation.

The propagation of all the sorts is effected abundantly by parting their roots any time from the decay of the stalks in autumn until new ones begin to rise in spring.

They may also be propagated by seeds; sowing them in autumn or spring, upon an east border, and the plants will rise plentifully in the spring; some of which, when about three inches high, may be thinned out and planted in a shady border till autumn, when these, and all the others may be transplanted where they are to remain.

LYTHRUM, Willow-herb, or Purple Loose-strife.

It furnishes some hardy herbaceous, erect-growing, flowery perennials for ornamenting the pleasure-garden compartments, rising with upright stalks, from one to three or four feet high; adorned with cordate-lanceolate, and linear leaves; and terminated by long spikes of hexapetalous, very ornamental, purple flowers.

Class and order, *Dodecandria Monogynia*.

Characters.] CALYX is monophyllous, cylindrical, having the brim indented in twelve parts alternately smaller. COROLLA, six oblong, obtuse, patent petals, inserted into the denticuli of the calyx. STAMINA, twelve filaments, the upper ones the shortest, and assurgent antheræ. PISTILLUM, an oblong germen, subulate, declinated style, and rising orbicular stigma. PERICARPIUM, an oblong, acuminate, unilocular, covered capsule, inclosing numerous small seeds.

There are about nine or ten species, but not more than one in esteem for our purpose, or that is commonly cultivated in the English gardens, which, however, comprehends some varieties.

LYTHRUM *Salicaria*.

(*Salicaria*) — or *Common Willow-herb*.] Hath a fibrated perennial root; upright, angular, purplish stalks, rising three or four feet high; cordate-lanceolate leaves, opposite by pairs; and the stalk and branches terminated by long, erect spikes of reddish-purple, dodecandrious flowers, in July.

Varieties.] With round leaves—with long acute leaves—trifoliolate-leaved, growing three leaves at a joint—quadrifoliolate, or four leaves at a joint—with quadrangular stalks—with hexangular stalks—with bright red flowers—purple-flowered—with verticillate or whorled flowers.

This beautiful plant and varieties are residents of brook-sides, and the like places in most parts of England, and are often disregarded; they however, merit culture in every curious garden for their stately growth, and ornamental appearance of their elegant flowers, which adorn the top of the stalk in very long erect spikes.

They may be employed to ornament any of the compartments of the pleasure-ground, but are the most prosperous in moist, or somewhat shady situation, in which they will grow taller, stronger, produce larger spikes, and continue longer in beauty; they, however, will grow freely any where.

The plants may be easily obtained in the places of their natural growth, and are sold at most of the nurseries; and the season for planting them is any time in open weather from October till March.

The propagation is by parting the roots, and by seed.

By parting the Roots.—Autumn, in October or November, is the best season: the root may be divided into slips, preserving fibres to each; which if tolerably strong, plant them at once where they are to remain; but if weak, set them in nursery rows for a year.

By Seed.—This is hardly worth practice, since the plants may be increased with the utmost facility by roots; however the most successful sowing season is autumn, soon after the seeds are ripe, sowing them in a bed or border of rich earth, and rake them in; they will rise in spring; in summer, if too thick, thin out some and plant them in nursery-rows till autumn; when both these, and those remaining in the seed-bed, may be planted out for good, and will flower the next summer.

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MAGNOLIA, Laurel-leaved Tulip-tree.

This genus consists of most elegant evergreen and deciduous trees of North America, for ornamental plantations, and the greenhouse; rising with upright trunks, dividing

upward into fine regular heads; adorned with noble large, oblong, simple foliage, and large novem-petalous flowers of remarkable fragrance; which, in America, their native soil, are succeeded by a large egg-shaped strobilus-like, scaly fruit, composed of many compressed,

pressed, roundish, unilocular capsules, containing large pendulous seeds, i. e. that being discharged from their departments, hang by long threads in a singularly curious manner; but the fruit never attains perfection in England, and is not of the eatable kind.

Class and order, *Polyandria Polygynia*.

Characters.] CALYX is three petaliform, oval, concave, deciduous leaves. COROLLA, nine oblong, concave, obtuse petals, narrow at the base. STAMINA, numerous short filaments inserted into the general receptacle, and linear antheræ attached to the sides of the filaments. PISTILLUM, numerous oblong-oval germina, very short, recurved, contorted styles, and, along each, a longitudinal hairy stigma. PERICARPIUM, an oval cone, composed of many compressed, roundish, almost imbricated, clustered, unilocular, bivalvular capsules, each containing one roundish-reniform, baccated seed, hanging by slender threads from the scales of the strobilus.

There are but four species, all of the tree kind, one of them an ever-green, and one of the most superbly beautiful in the world; the other three are deciduous, and also very beautiful. All the sorts, though originally of American growth, prosper in our gardens in the full ground all the year; they, however, being somewhat tender while young, require protection from frost, but afterwards may be turned out into the principal shrubbery plantations in the most conspicuous parts, where they will appear exceedingly ornamental in their fine luxuriant foliage, in some resembling the noble leaves of laurel, but much larger, as in some sorts they are near a foot long and almost half as broad.

Ever-green Kind.

This is a noble tree, very distinguishable from most others, by its singularly large and beautiful shining leaves.

1. *MAGNOLIA grandiflora.*

Greater Grandiflorous Ever-green Magnolia, or Laurel-leaved Tulip-tree.] Rises with an upright stem, branching out upward into a regular head, seventy or eighty feet high; garnished with very large, oval-spear-shaped, thick, firm, close-fitting, ever-green leaves, eight or ten inches long, and near half as broad, of a shining green above, and paler underneath; and from the ends of the branches, large pure-white flowers, of nine or ten broad-spreading petals, succeeded by oval, cone-like fruit, which never ripen in England.

Varieties.] Broad oblong-leaved ever-green Magnolia--narrower oblong-leaved--and with leaves of a shining green above, and of a rusty colour underneath.

Deciduous Kinds.

These sorts, though deciduous, are most beautiful trees, when in foliage, and elegant furniture for the best shrubberies.

2. *MAGNOLIA glauca.*

Glaucous-leaved Deciduous Magnolia.] Rises with an upright slender stem, branching ten or fifteen feet high, having a smooth white bark; oval-oblong, deciduous leaves, three or four inches long, of a glaucous hoary colour underneath; and from the extremity of the branches, white flowers, succeeded by conic fruit, which never ripens in England.

This sort is remarkable for retaining its leaves great part of winter.

Variety.] With ever-green leaves.

3. *MAGNOLIA tripetala.*

Tripetalate Deciduous Magnolia, or Umbrella-tree.] Rises with an upright stem, branching about twenty feet high; very large lanceolate leaves, disposed in circular rays horizontally, in form of an umbrella; and large white flowers, having the outer petals dependent.

The name Umbrella-tree is derived from the circular disposition of its admirable large foliage, so as, together, to resemble the form of an umbrella.

4. *MAGNOLIA acuminata.*

Acuminate Long-leaved Deciduous Magnolia.] Rises with an upright stem, branching fifteen or twenty feet high, having a smooth light bark; large, oval-oblong, acuminate-pointed leaves, eight or ten inches long, and half as broad; and white flowers, having from nine to twelve petals; succeeded by conical fruit, not ripening in England.

All these four species of Magnolia are admirable fine ornaments for the principal shrubbery compartments; some of the grandiflorous kind also for the green-house, which is the most beautiful of all the sorts; but all of them are remarkably ornamental in their large elegant foliage, which are universally simple, entire, and almost sessile; and all the species, after having acquired some considerable age and size, produce flowers here annually in June or July, are large, of a snowy white, and remarkable fragrance; and sometimes on old trees are succeeded by the formation of fruit; but it never acquires maturity in this country.

The flowers of all the sorts, in their characteristic state, consist each of nine oblong obtuse petals, and numerous filaments and germina, &c. See the *Characters*.

In the American woods where these trees grow naturally in great abundance, the flowers are numerous on each tree, continue a

long time in bloom, and perfume the whole woods with their agreeable odour.

All the four species are of somewhat tender temperature, and liable to injury from frost while young, the *Magnolia grandiflora* most of all; but none of them, however, so tender but that they may be naturalised to this climate, after having occasional protection in winter during their infant state, by keeping them in pots three, four, or five years, in order to move to shelter of a frame or greenhouse in frosty weather; observing that the grandiflorous kind need this care the longest of any, the seedling plants of which generally requiring to be four or five years old, of two or three feet growth, before they can be trusted in the full-ground finally; the other three sorts, as they drop their leaves in autumn, their shoots become more hardened, and not so subject to the rigours of frost, will generally succeed in the open ground after the second or third winter; but all the sorts should be gradually hardened by exposing them constantly to the full air summer and winter, in all mild or open weather, and only give shelter from frost; and when transplanted into the full ground, it should be done in March; but some of the ever-green *Magnolia* should also be retained in pots as green-house plants.

The grandiflorous ever-green *Magnolia* is one of the most beautiful trees in nature, both in the procerity and grandeur of its growth, and in its luxuriant noble leaves, which renders the tree singularly conspicuous and distinguishable at all seasons, and may be considered the finest ornamental ever-green yet known, both for the shrubbery and green-house. Remark, that as the trees of this sort are impatient of frost whilst young, they should be kept in pots a few years, in order to have shelter of a garden-frame or green-house, occasionally in winter, when frosts prevail; and even when those intended for the shrubbery are turned out into the full ground, it is proper to erect a sort of frame-work awning of small pliable poles, or rods, &c. archwise over each plant, in November, to support a covering of mats in rigorous and snowy weather, in severe winters: it is likewise proper, as before noticed, to retain some in pots, to be managed as green-house plants; and if those in the full ground should suffer by the frost, these will remain unhurt, and be as a reserve; observe, however, with respect to those in the full ground, to endeavour to naturalise them gradually as much as possible to stand our ordinary winters without much covering; which undoubtedly may in time be effected, especially in those raised by layers and cuttings from plants,

which have been of some years' standing in the open ground.

The deciduous *Magnolias* are also remarkably ornamental trees, and ought to be introduced into every curious collection in shrubberies, where, by their admirable fine foliage, they will exhibit an elegant variety. All these deciduous sorts, after having occasional shelter two or three winters in their minor state, will succeed tolerably in the open ground all the year without covering.

All the species, both ever-green and deciduous, are cultivated in the nurseries for sale; of which the first sort, as being the most beautiful, and requiring more care in its culture, is generally pretty high rated.

The best season for planting all the sorts is either in autumn, from the latter end of September till the beginning of November; or in the spring, February or March to the beginning or middle of April, before they begin to make an effort for shooting; though, as those sorts which are in pots may be turned out with the ball of earth about their roots, so as scarce to feel their removal, they may be occasionally transplanted in October or beginning of November; I, however, should generally prefer the spring-planting that they may be both firmly rooted, and inured to the soil, situation, and full air before winter.

Observe, that in the disposition of all the sorts in the shrubbery, as they are rather of a tender nature in their younger growth, it is proper to allot them a sheltered sunny situation, and dry soil; and all of them should be stationed in the most conspicuous point of view, and not too closely crowded with shrubs of inferior merit; they have also an admirable effect disposed singly in different parts, particularly in open spaces of grass-ground in some interior defended parts of the shrubbery plantations; the *Magnolia grandiflora* in particular appears beautiful in this mode of disposition; observing of this sort, wheresoever stationed, to allow it the occasional shelter of an awning of mats in frosty weather, as before noticed.

Propagation, &c. of all the Sorts.

The propagation of all the sorts is by seed, also by layers and cuttings.

By Seed.—This is received annually from America, preserved in sand, and commonly arrives here early in spring, which should be sown as soon after as possible in pots of light rich earth, half an inch deep; and the pots then either plunged in a moderate hot-bed, just to bring up the plants an inch or two high, or may be plunged in common earth under a warm wall or hedge, or in a frame, in

In the full sun till the middle or latter end of April, then replunged in an easterly border open to the morning sun; giving moderate sprinklings of water in dry weather, and the plants will rise the same year, those having aid of a hot-bed, probably in April, and the others in May; observing to inure those in the hot-bed timely to the full air. All summer let the seedlings raised by either method be very regularly supplied with water; at the approach of winter remove the pots into a green-house, or rather under a garden-frame, there sheltered from frost all winter, but indulge them with the open air all mild weather. In March, if the pots are plunged in a bark hot-bed, &c. under a frame, two or three months, it will forward the seedlings greatly; being careful to give water, and harden them to the open air gradually, so as to be removed into it, in their pots, fully in June, to remain till October, then allow them shelter in winter as aforesaid. In spring following, plant them into separate pots, and plunge them into a hot-bed as above, to set them forward, giving water, occasional shade, and the benefit of the free air; and in June remove the pots to a shady border for the remainder of the summer; in winter give them shelter, as before, from severe frost, but to have the full air in all open weather. The same care may be proper for two or three winters, when some of them may be turned out of the pots with the ball of earth about their roots, into the full ground in a warm place, especially the deciduous kinds; but the grandiflorous or ever-green sort, being tender, must not be too soon committed to the winter's cold; they should, therefore, be continued in occasional shelter, as above, four or five years, till two or three feet high, at least; and when turned out into the open ground, it is proper to mat them occasionally, as already hinted, in severe winters; still retaining some in pots to be managed as green-house plants.

By Layers.—All the sorts may also be propagated by this method, which may be performed in autumn or spring: choose the young pliable shoots, give them a gentle twist, or rather a slit in the part to be layed, and lay them in the usual method: some will be rooted in one year, others probably not in less than two; then in March take them off and plant each in a pot, plunge them in a moderate hot-bed for a month or two, to set them a-going freely at first, and they will form good strong plants by autumn, allowing them shelter in winter for a year or two, then may be transplanted into the full ground.

By Cuttings.—This may be effected by aid

of a bark-bed, either that in the stove, or any other. In March or April plant some short young shoots of the preceding year in pots, plunge them to the rims in the hot-bed, giving water and occasional shade; many of them will be rooted the same year, when they must be inured by degrees to the open air, afterwards managed as the layers.

MAHERNIA, a genus of shrubby exotics for the green-house.

Class and order, *Pentandria Pentagynia*.

Characters.] CALYX, a campanulated cup of one leaf, with the border cut into five awl-shaped segments. COROLLA, five oblong, heart-shaped spreading petals. STAMINA, five capillary filaments, topped with oblong, pointed antheræ. PISTILLUM, an ovate, five-angled germen, crowned with five bristly erect styles, topped with simple stigmata. PERICARPIUM, an oval, five-celled capsule, containing a few kidney-shaped seeds.

The species is,

MAHERNIA *pinnata*.

Winged-leaved Mahernia.] Hath a reddish shrubby stalk and branches growing irregular one foot high; small, tripartite, pinnatifid leaves, and scarlet flowers growing on longish pedicles from the sides and ends of the branches.

This species produces its little flowers from June to August; its propagation is by cuttings in the summer, and it requires a green-house for its protection in winter.

MALPIGHIA, Barbadoes Cherry.

The plants are shrubby ever-greens of the warm parts of America, &c. retained here in stoves for variety; rising with branchy stems, from eight or ten to fifteen or twenty feet high, ornamented with oval and lanceolate entire leaves, and large pentapetalous flowers, succeeded by baccaceous, cherry-shaped; red, eatable fruit.

Class and order, *Decandria Trigynia*.

Characters.] CALYX is small, five-leaved, connivent and permanent. COROLLA, five reniform, concave, spreading petals, having long narrow unguis. STAMINA, ten broadish, subulate, erect filaments, and heart-shaped antheræ. PISTILLUM, a roundish germen, three slender styles, and obtuse stigmas. PERICARPIUM, a large, globular, furrowed, unilocular berry, containing three angular, rough, stony seeds.

There are many species: those of them chiefly found in the English gardens are,

1. MALPIGHIA *glabra*.

Smooth-leaved Malpighia, or Common Barbadoes Cherry.] Rises with a shrubby, erect, slender stem, branching fifteen or twenty feet high;

high; oval, entire, very smooth, opposite leaves; and from the sides and ends of the branches long foot-stalks, each sustaining an umbellate cluster of rose-coloured flowers, succeeded by roundish, baccaceous, red, cherry-like fruit.

2. *MALPIGHIA puniceifolia.*

Pomegranate-leaved Malpighia.] Rises with a shrubby erect stem, branching diffusely eight or ten feet high; oval, entire, smooth, opposite leaves; and from the sides and ends of the branches shortish foot-stalks, each sustaining one pale-red flower, succeeded by round baccaceous fruit.

3. *MALPIGHIA urens.*

Stinging-leaved Malpighia.] Rises with a shrubby robust stem, branching fifteen or eighteen feet high; oblong-oval leaves, covered underneath with bristly, decumbent, stinging hairs; and from the sides of the branches aggregate foot-stalks, each sustaining one purple flower, succeeded by oval, red fruit.

Less common Species.

4. *MALPIGHIA verbasifolia.*

Moth-Mullein-leaved Malpighia.] With lanceolate-ovate, downy, entire leaves; and terminal clusters of flowers.

5. *MALPIGHIA nitida.*

Glossy-leaved Malpighia.] With spear-shaped, entire, smooth, shining leaves; and lateral spikes.

6. *MALPIGHIA crassifolia.*

Thick-leaved Malpighia.] With ovate, entire leaves, downy underneath; and terminal clusters of flowers.

7. *MALPIGHIA angustifolia.*

Narrow-leaved Malpighia.] With linear-lanceolate leaves, armed with declinated, rigid bristles, and umbellate flowers.

8. *MALPIGHIA coccigera.*

Scarlet-grain-bearing Malpighia.] With sub-ovate, dentated, spinous leaves; having scarlet glands.

All these shrubs retain their leaves the year round; the first three or four sorts are the most noted in our hot-house collections; they begin flowering here about the end of autumn, continuing in constant succession till spring, exhibiting a fine variety in the stove, where they are frequently succeeded by ripe fruit, which in most sorts is of the size and shape of a small cherry; is of an acid palatable flavour; and in the West Indies, where the shrubs grow naturally in vast plenty, the fruit is eaten by the inhabitants instead of cherries; but those of the first sort are in most esteem.

As the plants are natives of hot countries, they require a hot-house here, so must always

be kept in pots of rich earth, and retained in the stove, except about a month or two in the heat of summer, when they may be placed abroad; observing to supply them duly with water all the year.

Their propagation is by seed; sow it in spring, in pots of rich earth, and plunge them in a hot-bed; and when the plants are three or four inches high, prick them in separate small pots, give water, and plunge them in the bark-bed in the stove, where let them remain a year or two, then may be placed in any part of that department.

MALVA, Mallow.

This genus consists of herbaceous perennials, biennials, and annuals, for medical uses, and for ornament in gardens; and a shrubby plant for the green-house, rising mostly with erect stalks, from about half a yard to ten or twelve feet high, in different sorts; garnished with large, roundish, lobated leaves, and quinquepetalous flowers.

Class and order, *Monadelphia Polyanthia.*

Characters.] CALYX is double; the exterior part is of three heart-shaped leaves, the interior is monophyllous, and five-parted at the brim. COROLLA is five obcordate, plane petals, coalescing at their base. STAMINA, numerous monadelphous filaments, inserted into the corolla, and kidney-shaped antheræ. PISTILLUM, an orbicular germen, short cylindric style, and many bristly stigmas. PERICARPIUM, a round depressed head, composed of numerous arilli, or seed covers, each having one kidney-shaped seed.

There are upwards of twenty different species, but not more than four or five generally known here; three or four of which are hardy herbaceous plants, and one shrubby exotic for the green-house.

Hardy Herbaceous Kinds.

The first and second of these kinds, are common Mallows of the field, for medicinal purposes; the others are sometimes kept in gardens for variety.

1. *MALVA sylvestris (perennial.)*

Common Wild Upright Mallow.] Hath a long, fibrated, tough, deeply-striking root; upright stalks, two or three feet high; garnished with roundish seven-lobed leaves, having the lobes acute; and many reddish-purple flowers from the sides of the stalks.

Varieties.] With jagged leaves—with white flowers—with blue flowers.

This is perennial in root, but annual in stalk, and grows wild every where: its root, leaves, flowers, and seed, are all medicinal.

2. *MALVA rotundifolia (annual.)*

Round-

Round-leaved Prostrate White Mallow.] Hath prostrate, or declinated stalks; roundish-cordate, obsolete five-lobed leaves, and purplish flowers.

This also grows wild, as the former.

3. MALVA *Alcea* (perennial.)

(*Alcea multifida*)—or *Vervain Mallow.*]

Hath long, fibrated roots; upright stalks, branching two feet high; garnished with large, many-parted, roughish leaves; and large bright-red flowers from the sides of the stalks.

Varieties.] With downy leaves—with white flowers.

This sort and varieties grow wild in some parts of England.

4. MALVA *moschata* (perennial.)

Moschataceous Jagged-leaved Vervain Mallow.] Hath long fibrated roots; reniform, deeply-cut, radical leaves; upright stalks, branching about two feet high, garnished with five-parted leaves, having the lobes pinnated into many parts; and large red flowers.

Varieties.] With roundish leaves—curled leaves—with white flowers.

They grow wild here in some parts.

5. MALVA *crispa* (annual.)

Curled-leaved Syrian Mallow.] Rises with an upright, strong, thick stalk, six or eight feet high; closely garnished with large, angular, curled leaves, having the edges curiously furbelowed; and from the axillas glomerated clusters of reddish flowers.

This is an annual of Syria, but hath been long retained in our gardens for ornament.

All the above five herbaceous Mallows flower in June, July, and August, succeeded by great plenty of seed in autumn.

Shrubby Green-house Kinds.

6. MALVA *capensis*.

Cape Shrubby Mallow.] Rises with a tree-like, erect, thick, durable stem, ten or twelve feet high, branching out laterally the whole length, the branches numerous and hairy; garnished with subcordate, lacinated, smooth leaves; and from the sides of the branches, large deep-red flowers, appearing great part of the year.

Variety.] Gooseberry-leaved Cape Shrubby Mallow.

With respect to the merit of all these six species of Malva, take the following hints.

As to the five herbaceous kinds, the two first of them are exceedingly useful in medicine, particularly the *Malva sylvestris*; but they both growing wild all over England, &c. and being most troublesome weeds, are rarely admitted into gardens; but the third and fourth sorts, although they grow naturally

also in some parts of England, are introduced into many gardens for ornament and variety, and they effect a very conspicuous diversity in assemblage with other plants of similar growth; and the *Malva crispa* is likewise very proper to increase the variety in large borders, &c. in pleasure-grounds, which it effects most agreeably in the procerity of its growth and beautifully furbelowed leaves.

And the Cape Shrubby Mallow is very ornamental, and green all the year, but being a native of Africa, requires shelter in winter, therefore must be kept in pots of good earth, and placed in the green-house collection.

Propagation.

All the herbaceous kinds are raised plentifully from seed. Sow them in spring, in a bed or border of any common earth, either in patches where they are designed to flower, half an inch deep, or in a bed, and raked in, for transplantation, which should be performed when the plants are three or four inches high; though I should advise the annual sort in particular to be sown in patches where the plants are to remain; several seeds in each patch; but leave only two or three of the best plants to grow to perfection.

The shrubby kind is also easily raised from seed in spring, but should have the aid of a hot-bed; and when the plants are about three inches high, plant them in small pots, harden them by degrees to full air, afterwards manage them as other green-house exotics.

MAMMEA, Mamme-tree.

There are but two species, both large evergreen trees of the hot parts of America and Asia, and retained here in hot-houses for variety, both of them adorned with large oval-oblong stiff leaves, and large quadripetalous flowers, succeeded, in their native country, by large, round, eatable fruit, of a most exquisitely rich flavour.

Class and order, *Polyandria Monogynia*.

Characters.] CALYX is monophyllous, two-parted, and deciduous. COROLLA, four large, concave, spreading petals. STAMINA, numerous short filaments, and oblong antheræ. PISTILLUM, a roundish depressed germen, cylindric style, and a capitated permanent stigma. PERICARPIUM, a large, spherical, baccaceous, fleshy, unilocular fruit, terminated by the style, and contains four sub-oval rough seeds.

The species are,

1. MAMMEA *americana*.

American Mamme-tree.] Rises with an upright, robust, rough trunk, branching sixty or seventy feet high; large, oval-oblong, firm, splendid leaves; and flowers having the stamina

shorter

shorter than the corolla; and large round fruit.

2. *MANMEEA asiatica.*

Asiatic Mamtree-tree.] Rises with an upright large stem, branching fifty or sixty feet high; covered with a cinereous, furrowed bark; large oval-oblong leaves; flowers, having the stamina longer than the corolla; and large tetragonous fruit.

Both these trees in their native soil produce abundance of fine fruit, as large as Catherine peaches, of a yellowish-green colour, and said to be of a delicate flavour, but which is not produced in this country.

The first sort grows in great plenty in the West Indies; and the other in Java.

In this country they require to be continued constantly in the stove, so must be kept always in pots, and placed in that conservatory, where they will cause a fine variety all the year with their large splendid foliage.

Their propagation is by seed, which arrives from America, &c. in spring. Sow it in small pots of light rich earth, and plunge them in the bark-bed, where they will soon come up; give gentle waterings, and about August transplant them into separate pots a size larger, plunging them in the bark-bed, and give shade and water till fresh-rooted.

MANGIFERA, Mango Tree.

A genus furnishing for the stove an East India tree, of considerable growth in its native soil; ornamented with long simple leaves; and flowers having quinquefid cups, five spear-shaped petals, five stamina, a roundish germen, supporting a single style; and the germen becomes a large, roundish-reniform, plum-like fruit, including one nut; admired as a choice pickle when green, and when ripe to eat; but not produced in this country.

Class and order, *Pentandria Monogynia.*

The species is,

MANGIFERA indica.

Indian Mango Tree.] Rises with a woody stem and branches to a large growth; garnished with long, spear-shaped, pointed leaves, and loose peduncles of flowers, succeeded by large eatable fruit, in India, of a delicious flavour when ripe; and when green are in great estimation as a pickle, in that country; from whence we receive abundance of them in that state, under the name of India Mangoes.

This species is retained in curious stove collections for variety; is raised from the nuts imported from the Indies; and being procured as fresh as possible, are sown in pots of light earth and plunged into a bark-bed: and the

plants thereby raised, are managed as other woody exotics of the stove.

MANURE. This comprises all sorts of dungs, composts, and other materials proper for the improvement of land. See **COMPOSTS**, **DUNG**, &c.

Manure, therefore, is necessary to all soils, to repair them when exhausted by the growth of vegetables, and to cure the defects of soils naturally bad, such as to enrich and fertilise very poor land; to render very strong or stubborn land more light, loose, and pliable; and to render very light, loose, dry soils more compact and moist; and wet land drier, &c. strong moist land is the most improved by light Manures, to open and loosen it; very light land by the more heavy and moist sort of Manure; and wet land by dry light composts; some soils require Manure annually, others but once in two or three years; all of which, in respect to garden-culture, is fully explained under the article **DUNGS**, &c.

The proper Manure for garden-ground being fully exhibited under the article **DUNGS**, it is needless to repeat it here.

But for corn-fields, &c. various sorts of Manure are occasionally used, according to the nature of the soil, and what the different countries afford, as, for instance—

All sorts of horse-dung, neat's-dung, hogs'-dung, farm-yard mulch, or a mixture of all or any of those together, suits almost all sorts of land; or a compost of any or all of those, and chalk, lime, earth, mud of ponds and ditches, cleanings of streets, ashes, rotten tanner's bark, rotten wood, and saw-dust, rotten vegetables, &c. or such of any of these materials as can be had, and formed into a compost-heap to rot together, make a good Manure, both for corn and grass-land.

For the method of making compost heaps, see **COMPOST**.

Rotten tanner's-bark, alone or in compost, is good Manure for strong, cold corn-land; and will also suit grass, if applied the beginning of winter, for the rains to wash it into the ground.

Rotten wood, and rotten saw-dust, is very proper for strong land.

Rotten vegetables, such as all sorts of weeds, and the refuse of kitchen-gardens, &c. laid in heaps, and if mixed with mud or any earthy substance, and the whole lie to rot, they will make a tolerable good Manure for corn-land.

Green fern, mowed down and laid in heaps to rot, is also used as Manure.

Marle, chalk, lime, &c. properly prepared, either alone, or in compost, are greatly used

used in many places as a dressing for corn-land.

Sea-sand and shells, &c. being full of salts, are sometimes used as Manure for strong clayey and stubborn loamy soils.

Sea-weed is likewise employed as Manure, and, being full of salts, greatly improves corn-land.

Ashes of all sorts prove excellent Manure, especially to all strong, cold, or moist land; but coal ashes are superior to those of wood, or of any other kind of vegetables; the farmers in the counties round London have experienced this, and they fetch them from that city by cart and waggon-loads, twenty or thirty miles distance; for in London they in general using coal-fuel, prodigious quantities of ashes are daily made, and collected in carts and carried to the ash-hills in the environs of the city; where numbers of people are employed in sifting them, and sell the siftings by the sack or load to the farmers for Manure; also to the brick-makers for tempering their loam or brick-earth.

Bones of animals are also used as Manure for ploughed-land, where they are to be had in due quantities, as about London and other great cities.

Soot is also used as Manure to sprinkle thinly over corn-land.

Malt dust, containing a natural heat and sweetness, proves an eligible Manure to most sorts of land, but more particularly to stubborn, clayey, and sour, harsh soils.

Cleanings of streets laid in compost-heaps with horse-dung, &c. make excellent Manure both for corn and grass-ground.

All manure for ploughed or digged-land should be applied at the time the ground is to be tilled, and not spread about any long time before it is ploughed in, especially in hot dry weather, which would exhaust the salts, and other enriching particles; observing, however, where any hard substances, as marle, shells, &c. are used for Manure, it is proper to spread them abroad some considerable time, exposed to the sun, rains, and frost, to pulverise, before they are ploughed into the ground.

The Manuring grass-land should generally be performed in autumn, towards Michaelmas, or a little before or after, and not in the heat of summer, as is often practised, whereby the sun's heat greatly exhausts its moisture and goodness; but when done in autumn, the rain soon washes the enriching particles into the ground, to the great benefit of the grass, and increase of the future crop.

MARANTA, Indian Arrow-root.

It consists of two herbaceous perennial exotics of the Indies, kept here in hot-houses for curiosity; have thick, knotty, creeping roots, crowned with long, broad, arundinaceous leaves, ending in points, and upright stalks, half a yard high, terminated by bunches of monopetalous, ringent, five-parted flowers.

Class and order, *Monandria Monogynia*.

Characters.] CALYX is three spear-shaped leaves placed on the germen. COROLLA is monopetalous and ringent, has an oblong, compressed, oblique, inflexed tube, the limb divided into six parts, the side ones large and represent a lower lip. STAMINA, one membranous filament, resembling a segment of a corolla, and linear antheræ attached to the border. PISTILLUM, a roundish germen under the calyx, simple style, and obsoletely trigonous stigma. PERICARPIUM, a roundish, trigonous, trivalvular capsule, and one oval hard seed.

The species are,

1. MARANTA *arundinacea*.

Arundinaceous or Reedy Maranta.] Hath a thick, knotty, creeping, fleshy root, crowned by long, broad-based, arundinaceous or reed-like leaves, diminishing upward to a point; amidst them upright, divided, branchy stalks, two feet high, terminated by bunches of white flowers.

2. MARANTA *galanga*.

Galangale Indian Arrow-root.] Hath a thick, creeping, fleshy, juicy root; crowned by many smooth leaves, six or seven inches long; amidst them upright, simple, or undivided stalks, half a yard high, terminated by loose bunches of small white flowers.

Both the sorts flower here annually in June and July, each flower consisting of one ringent or grinning petal, six-parted at top. See the *Characters*.

The plants are perennial in root, but annual in leaf and stalk; sometimes, however, the leaves of the second sort abide most part of the year.

Both the species being natives of the hot regions of the Indies, in this country they must be potted, and always kept in the hot-house, plunging them mostly in the bark-bed, and refresh them with moderate waterings, but more frequent when in a growing state; and shift them into larger pots occasionally.

Their propagation is by parting the roots; and spring is the proper season, just before they begin to shoot; planting them in pots of light rich earth, and plunge them in the bark-bed.

In America, a poultice of the roots of the *Galanga* being used by the Indians to extract the

poison communicated by their poisoned arrows, it derived the name of Arrow-root.

MARLE, a kind of clayey, or strong earthy substance, of a chalky nature, generally placed deep in the earth, and is of a fertile quality, by its salt and oily properties, and is use to manure land. See MANURE.

Marle is of different natures in different parts.

Some is nearly of the nature of fuller's earth, and is of a fat enriching quality, and of which there is blue, grey, yellow, and red coloured; the blue is esteemed to be the best.

Some is a kind of soft stone, or rather of a stoney nature, of a bluish and grey colour, and is called stone or slate Marle, found commonly near river-sides, and sides of hills, &c. and though hard when dug, easily dissolves by rain and frost.

Clay Marle resembles a fat sort of clay or loam, and is sometimes mixed with chalk stones.

Spitting or delving Marle is of a compact, strong, fat temper, generally of a brown colour; and is met with in the sides of hills, and in some wet boggy grounds.

There are some other sorts of Marle of less note, which lie very deep, and not so easily obtained.

The sure sign of the goodness of Marle is when it readily dissolves by wet or frost.

All the sorts of Marle are accounted good manure for improving light, loose, sandy land in particular, especially the fat kinds of Marle; though it may be applied with success to most sorts of land, observing, however, to use it more sparingly on strong soils, lest it bind them too close; but to sandy ground there can be no danger, and proves one of the best dressings for such kind of land.

It is commonly laid upon the land as it is taken from the pits; but some burn it, when one load will go as far as three or four.

MARTYNIA, *Martynia*.

This genus consists of three tender, herbaceous, flowery annuals, and a perennial, natives of South America, for the hot-house, or to be raised in hot-beds; rising with erect stalks one to two or three feet high, garnished with oblong, simple leaves; and terminated by short spikes of monopetalous, ventricose, five-parted flowers, of ornamental appearance, purple, red, white, blue, in the different species.

Class and order, *Didymia Angiospermia*.

Character.] CALYX is five-parted and withering. COROLLA is monopetalous, bell-shaped, the tube ventricose, and the limb five-parted at top. STAMINA, two long and two

short incurved filaments, and connivent connected antheræ. PISTILLUM, an oblong germen, simple style, and bilobed stigma. PERICARPIMUM, an oblong, quadrangular, quinquelocular capsule, opening in two at top, and having oblong seeds.

The species are,

1. MARTYNIA *annua*.

Annual Martynia.] Rises with an upright, robust, hairy, branching stalk, three feet high; garnished with large, oval-oblong, angulated, hairy, viscous, entire leaves; and from the forks of the stalk, and ends of the branches, short spikes of large reddish-purple flowers.

2. MARTYNIA *proboscidea*.

Heart-leaved Hairy Martynia.] Rises with an annual, thick, fleshy, branching stalk two feet high; garnished with entire, heart-shaped, viscous, hairy leaves, and from the ends of the branches spikes of flowers, of a pale red.

3. MARTYNIA *Craniolaria*.

(*Craniolaria*) — or *Long-tubed Martynia*.] Rises with a branching annual stalk, two feet high; garnished with heart-shaped, angular-lobate leaves, and from the sides and ends of the branches spikes of white flowers, with a very long tube to the corolla.

4. MARTYNIA *perennis*.

Perennial Martynia.] Hath thick knotty roots, sending up several robust, simple, succulent, purplish stalks, a foot high; garnished with oblong, serrated, thick, close-fitting leaves, and terminated by short spikes of blue flowers.

These species flower here in July and August, and are very ornamental; each flower is of one bell-shaped petal, succeeded by large, oblong, thick, tough capsules, which in the annual sorts ripen here in autumn, but the perennial seldom ripen seeds in England.

These plants being inhabitants of the hottest parts of the world, will not succeed here without artificial heat, so require the aid of a hot-house or hot-bed.

In respect to their duration, the annuals continue but one season, the other several years by the root, but the stalks decay annually in autumn.

The annual sorts are propagated by seeds sown in pots in spring; and plunge them in a hot-bed, or in the bark-bed in the stove, giving sprinklings of water; and when the plants are two or three inches high, plant them out in separate small pots, which plunge also in the bark-bed, allowing them shade and water; and when they are a little advanced in growth, shift them into larger pots, managing them as above.

The

The perennial sort is propagated by dividing the roots in spring, planting each off-set in a pot of rich mould, and plunged in the bark bed.

It may also be increased by cuttings of the stalks planted in pots, and plunged in the bark bed.

MAS *Planta*, a Male Plant; a dioecious plant, which produces male flowers only. See the class *Diœcia*.

All the plants of this kind belong to the class *Diœcia*, and the plants of which have male and female flowers always on separate roots, i. e. the Males on one plant, and the females on another; so that the plants furnishing the Male blossoms are properly Male Plants, and those producing female flowers are termed female plants. See FEMINEA *Planta*.

Of this kind are spinach, hemp, *myrica*, *menispermum*, and many others.

Male Plants never produce seed; which is produced only from the females; but both Male and female plants rise from the same seed.

MASCULUS *Flos*, a Male Flower; a flower of the classes *Diœcia* and *Monœcia*, which is furnished with stamina, &c. or Male organs; but not the pistillum, style, and stigma, the female organs. See STAMINA, PISTILLUM, and FEMINEUS *Flos*.

Male Flowers are produced either upon separate plants from the females, as in all the plants of the class *Diœcia*, or on the same plant with the females, as in cucumber, melon, and all other plants of the class *Monœcia*, so that Male and female flowers, separated on distinct plants, constitute the class *Diœcia*; and separated on the same plant, the class *Monœcia*; those of the latter are also androgynous, that is, a mixture of both Male and female flowers on the same plant. See ANDROGYNA *Planta*, and the classes *Diœcia* and *Monœcia*.

MASSONIA, a genus of bulbous-rooted herbaceous flowery perennials for the greenhouse, crowned with roundish and lanceolate leaves, and monopetalous, six-parted, liliaceous flowers.

Class and order, *Hexandria Monogynia*.

Characters.] CALYX, none. COROLLA, six lanceolate spreading petals, placed on the upper part of a nectarium which is under the flower, cylindric, membranaceous, six-furrowed, and dentated. STAMINA, six slender incurved filaments, inserted on the teeth of the nectarium. PISTILLUM, a germen under the corolla, subulate style, crowned with a simple stigma. PERICARPium, a trique-

trous three-winged capsule, opening with three cells, containing many smooth seeds.

The species are,

1. MASSONIA *latifolia*.

Broad-leaved Massonia.] Massonia with a bulbous root, crowned with roundish, pointed, spreading leaves, upright clusters of flowers on short footstalks, and spreading corolla.

2. MASSONIA *angustifolia*.

Narrow-leaved Massonia.] Massonia with a bulbous root, crowned with oblong spear-shaped erect leaves, and clusters of flowers with reflexed corollæ.

These plants are exotics of the Cape of Good Hope, and require the protection of a green-house.

They are propagated by off-sets from the roots, when the leaves, &c. are decayed, and may also be propagated by seeds sown in pots of light sandy earth, plunging them in the bark bed in the stove, or other similar department, or in a common hot-bed under frames and glasses.

MATRICARIA, Feverfew.

The plants are hardy herbaceous perennials of upright growth, valuable in medicine, and to ornament the pleasure garden, rising two or three feet high, garnished with compound pinnated leaves, and terminated by many compound radiated flowers.

Class and order, *Syngenesia Polygamia Superflua*.

Characters.] CALYX, a compound radiated flower, having a hemispherical general cup, composed of linear imbricated scales. COROLLA, the general flower is compound and radiated, having the disk composed of numerous funnel-shaped hermaphrodite florets, five-parted and spreading at top, and oblong flat female florets compose the radius. STAMINA, in all the hermaphrodites five short filaments and cylindric antheræ. PISTILLUM, an oblong germen, slender style, and in the hermaphrodites a bifid patent stigma, in the females two revolute ones. PERICARPium, none; many oblong naked seeds.

There are several species, but not more than one that has any particular merit, viz.

MATRICARIA *Parthenium*.

Common Feverfew.] Hath very fibry clustering roots, crowned with numerous compound leaves; upright stalks branching on every side, two or three feet high; garnished with compound plane leaves, of seven oval folioles, cut into many parts; and all the branches terminated by many compound, radiated, white flowers, having a yellow disk.

Varieties.] With full double flowers—with semi-double flowers—with double fistular flowers

flowers—with a fistular disk and plane radius—with short-rayed flowers—with rayless flowers—with rayless sulphur-coloured heads—with finely curled leaves.

This species and all its varieties flower abundantly in June, each flower composed of numerous hermaphrodite and female florets; the former compose the disk, the latter the radius, or border, and which, in the double and in the fistulous kinds, are very ornamental in gardens, but of disagreeable odour, and are all succeeded by plenty of seed in autumn.

The plants are mostly perennial in root, though in some moist soils are rather biennial, or but of two or three year's duration.

They have all a disagreeable odour, but possess exceedingly great merit as medical plants, being very efficacious in many disorders, and for which properties they are worthy of a place in every garden.

Considered also as plants of ornament, all the doubles and fistular-flowered kinds, and the curled-leaved sorts, are proper furniture for any of the compartments of the pleasure-garden, where in assemblage they will effect a very agreeable variety, and the flowers will continue a month or six weeks in beauty.

Propagation.

The propagation is by seed, parting the roots, and by cuttings.

By Seed.—All the varieties are tolerably permanent from seed, where, during their flowering, &c. they stand separate at a distance. Sow it in March and April, upon a bed or border of light earth, and rake it in; and when the plants are two or three inches high, plant them out in nursery rows, six inches asunder, to remain till autumn, then transplant them finally, and they will all flower the following summer.

By parting the roots.—All the sorts may be propagated in plenty by this method; but is effectual for continuing any approved variety of the double-flowered and curled-leaved kinds, or any other sort; observing, previous to this method of propagation, that in order to encourage the plants to afford slips, their flower-stalks, as soon as the flower begins to fade, should be cut down close, when the plants will more readily push out fresh heads, or off-sets at bottom, both for continuing the roots, and for propagation; and they may be slipped or divided for increase, either in autumn or spring.

By Cuttings.—This, like dividing the roots, is the certain method for continuing any particular variety. The cuttings of the young stalks planted in spring or summer, in a shady border, in the usual way, will readily grow, and become good plants by autumn.

Remark: it is always proper to raise some of the best varieties every year or two from seed, as before directed, to supply the place of any old roots that may prove biennial.

MATS, Garden Mats.

In gardening, Mats are of great utility on many occasions, such as both in covering or sheltering various sorts of plants in winter and spring, in frosty and other cold weather; and in summer to use in shading many sorts of young or tender kinds occasionally from the sun; and for many other purposes in the different garden departments, hereafter mentioned.

Garden Mats are of different sorts in regard to size, substance, and utility, they being small, middling, and large sizes: but for general use in principal gardens, those called Russia Mats are superior in size, substance, general utility, and durability in use; though it may also be proper to have some of the smaller or middling sizes for particular occasions, or small gardens, in which they may probably, for some purposes, be more convenient than large mats; however, all of which are useful in various horticultural occasions, and are sold by most of the principal nursery men and seedsmen at moderate prices, from five or six to ten or twelve shillings per dozen, according to size and strength; and should be provided therewith, less or more in every good garden, ready for use occasionally in the various different purposes, as in the following intimation, in the several garden departments.

In the kitchen garden, Mats are of essential utility in all hot-bed work, particularly for covering or spreading over the lights or glasses of the frames every night, in winter and spring, to exclude the external night cold; also occasionally in the day-time in very severe weather, and heavy falls of snow, rain, &c. likewise for occasionally covering several sorts of small young esculents, in the full ground in beds and borders, in the same seasons; as young lettuces, cauliflowers, small-sallad herbs, early radishes, &c. both in open beds and sometimes under frames, and hand-glasses to defend them from cutting frost, snow, and other inclement weather: and sometimes in raising, transplanting, or pricking out small or moderate portions of some particular sorts of plants, both of hardy and tender kinds, either of esculent plants, or annual flowers, or both occasionally, in the spring, some on beds or borders of natural earth, or others in hot-beds, without frames; the said beds, borders, hot-beds, &c. being arched over with hoops, or rods, can be readily covered with Mats every night, and all intemperate weather in the early spring months; and by the aid of which,

which, the plants will be both preserved from the effects of cold, and forwarded in their growth; either some sorts to remain for attaining perfection, or others for transplanting with the same advantage: and likewise in the spring and summer, in hot, dry, sunny weather, Mats are exceedingly useful in shading several sorts both in seed-beds before and after the young plants are come up, and beds of pricked-out small young plants, to shade them from the full sun till they take fresh root; as also for shading the glasses of hot-beds occasionally, when the sun is too powerful for particular sorts of plants in the heat of the day, as in cucumbers, melons, &c.

Likewise in kitchen gardens and other garden districts furnished with wall-trees, Mats are of great use in spring to cover the wall-trees of some particular principal sorts when in blossom, and when the young fruit is setting and advancing in its early growth after the decay and fall of the bloom; by which assistance, in cold springs, in February or March, and April, when sharp frosts sometimes prevail, a tolerable good crop is often saved, when, in trees fully exposed, the whole is cut off by the severity of the cold weather.

Also in the flower-garden and pleasure-ground, Mats are very useful on different occasions, in sheltering beds of some curious sorts of choice flower-plants, both in their advancing growth, to protect them from cold in winter and spring; and when in full bloom, to shade and screen the flowers from sun and rain, to preserve their beauty more effectually, and to continue them longer in blow of a lively appearance: also to cover beds, &c. in raising various tender annuals from seed in the spring; and in pleasure-grounds, Mats are occasionally required in winter to defend some kinds of curious tender ever-greens, &c. planted in the full ground, such as the *Magnolia grandiflora*, broad-leaved myrtle, olive, tea tree, &c. either standing detached, or trained against a wall.

And in nurseries, Mats are of considerable utility in many necessary requisites in the propagation, raising, and culture of numerous sorts of tender or curious exotics, in defending them from cold, and shading from scorching sun, while the plants are in minor growth, or as occasion may require: likewise in the public nurseries and others, Mats are necessary for matting round bundles or baskets of tender or curious plants, when to be conveyed to some distance.

Mats are also of great use occasionally in severe winters on most kinds of glass-work, as green-houses, hot-houses, forcing frames, &c.

in covering the glasses externally in very rigorous frosts, both of nights, and occasionally in the day, when severe and cloudy weather.

So that from the above intimations it will appear how useful Mats are in almost every department of gardening, and are the most convenient materials to use in many occasions of covering from cold, and shading from the sun, especially in most kinds of hot-beds, and occasionally in small or moderate compartments of beds and borders in the full ground, more convenient and eligible, in many purposes, than straw-covering, without that littering confusion and appearance, as is often unavoidable in the latter-mentioned, though also a very necessary and useful occasional covering in some particular cases in winter, &c. but, exclusive of this, every principal garden should have a supply of good Mats, less or more, according to its extent, and as it may seem necessary in the culture of particular plants, flowers, fruits, &c. required in early or superior perfection, as well as in protecting many curious and tender plants, trees, and shrubs, in young growth.

Having procured a set of Mats, if the ends are open or loose, they should be secured before using them, by tying the end threads or strings of the bafs close and firm, otherwise the Mats would soon ravel out loose in that part, and be spoiled, or much diminished in their useful purposes, and become less durable.

In using the Mats in this work of covering and shading, &c. should generally in uncovering, if casually rendered very wet by rain or snow, spread them across some rail, hedge, or fence, &c. to dry, before folding them together, that they may be preserved from rotting, whereby to continue them as long as possible in good condition; otherwise, without this care, they would scarcely last above one season.

It should likewise be observed of garden Mats, that as the material, bafs, of which they are made, is of great use as ligatures for tying, in many occasions in gardening, and for which purpose an inferior fresh Mat or two should be allotted, from which to draw the said ligatures of bafs strings, as occasion may require, and not draw them in a promiscuous way from the principal Mats appropriated for the business of covering, which would soon spoil them for that occasion.

MAURITIA, Ginkgo, or Maidenhair Tree.

Consists of an exotic, garnished with lobate leaves, and amentaceous flowers.

This tree, a native of Japan, has been several years in England, but hath not produced any

any flowers with us; all the description hitherto given by those who have observed the flower in Japan, consists of the male flower only.

Class, *Diæcia*.

Characters.] The male flowers in an oblong sessile amentum. CALYX, a monophyllous cyathiform, truncated, three-sided cup. COROLLA, monopetalous, short tube, with the border cut into three equal lanceolate stiff segments. STAMINA, six very short filaments inserted in the tube of the corolla, with linear, angulated antheræ.

The female flowers are undescribed.

There is but one known species, viz.

MAURITIA *Ginkgo*.

(*Ginkgo*)—or *Maiden-hair Tree*.] Rises with a thick upright stem, branching to a large head, many feet high, wholly covered with a whitish bark, and garnished with large, pale-green leaves, narrow below, expanding wide above in the form of a maiden-hair leaf, dividing at top into two lobes, unequally parted, streaked, without fibres and nerves; both surfaces of similar appearance, singularly curious; with male flowers in amentums; the females and fruit not perfectly known.

The whole plant has a singular appearance, and will stand our winters, if trained to a wall, and sheltered with mats in severe weather, though more commonly it is retained in the green-house.

Its propagation is by laying the young branches in summer; also, by cuttings assisted by a hot-bed.

MEDEOLA, Climbing African Asparagus.

The plants are herbaceous, one of which is a volubilate climbing exotic of Africa, cultivated here as a green-house plant; is adorned with pinnated leaves, and hexapetalous, spreading, revolute flowers.

Class and order, *Hexandria Trigynia*

Characters.] CALYX, none. COROLLA, six oblong-oval, spreading, revolute petals. STAMINA, six awl-shaped filaments, and incumbent antheræ. PISTILLUM, three corniculated germens, three styles, and recurved stigmas. PERICARPIUM, a roundish, trifid, trilocular berry, and three heart-shaped seeds.

There are but two species, one of which is a tall climber, the other a small erect plant; but it is the climbing sort that is usually cultivated, of which there are two varieties, both for the green-house.

MEDEOLA *asparagoides*.

Climbing African Asparagus.] Hath roots composed of several oblong, fleshy knobs, united at top; sending up annually long, climbing, very branchy stalks, winding round

any support four or five feet high; pinnated leaves, composed of oval-spear-shaped, alternate folioles; and from the sides of the branches white flowers, singly and by twos on each foot-stalk.

Variety.] Narrow-leaved; having weaker stalks, and longer and narrower leaves.

Both the varieties flower here in October and November, each flower of six spreading, rolled petals, and the seeds ripen in spring.

They are perennial in root, and annual in stalk, which generally dies to the ground every summer, and new ones shoot up in autumn, continue their growth all winter, and exhibit their leaves and flowers in full vigour.

They must be potted in light rich earth, and placed among the green-house plants to have shelter in winter; afford them moderate watering all the year, and larger pots occasionally.

The propagation is by parting the roots; they furnish off-sets freely, and the proper time to take them off is in summer, when the stalks are decayed: plant each in a pot of good earth, and place them in the shade, and give occasional light waterings; they shoot up stalks in the end of August, or early in September; place sticks for them to twine upon, and in autumn move them into the green-house, where they will exhibit their foliage, and flower most part of winter.

MEDICAGO, (*Medica*) Medick.

This genus furnishes a shrubby ever-green for the green house and shrubbery, herbaceous annuals for the pleasure-garden, and that celebrated herbaceous perennial called Lucerne, for field culture, as fodder for cattle; all of them garnished with trifoliate leaves, and papilionaceous flowers.

Class and order, *Diadelphia Decandria*.

Characters.] CALYX is monophyllous, bell-shaped, and divided into five acute segments. COROLLA is papilionaceous, consisting of an oval, entire, reflexed standard, two oblong-oval wings, and an oblong, bifid, obtuse, reflexed carina, bending from the vexillum. STAMINA, ten diadelphous filaments, and small antheræ. PISTILLUM, an oblong, incurved, compressed germen, short style, and small stigma. PERICARPIUM, a long, compressed, inflexed pod, inclosing several reniform seeds.

There are many species, but not more than three which have merit for our collection, one shrubby ever-green, one herbaceous annual, and an herbaceous perennial.

Shrubby Kind for the Green-house and Shrubby.

It is retained commonly as a green-house plant,

plant, but will also succeed in the full ground in a warm situation.

1. *MEDICAGO arborea*.

Tree-Medicago, or Shrubby Moon-trefoil.]

Hath a shrubby stalk, branching numerous and erectly six or eight feet high, having the younger branches covered with a hoary silvery down; closely garnished with trifoliate, ever-green leaves, each composed of three small wedge-shaped lobes, hoary underneath; and from the sides of the branches, long foot-stalks, terminated by clusters of bright-yellow flowers, succeeded by moon-shaped pods.

This is a beautiful ever-green and flowering shrub, and exhibits a plentiful bloom, from spring till autumn, and if sheltered in winter, will continue in flower most part of the year.

It being a native of Italy, with us, is consequently a little tender, and requires shelter in winter, either of a green-house, or of a warm sheltered situation in the full ground, for it will live in the open air in the shrubbery in moderate winters; but as being rather impatient of severe frost, it is proper always to keep some also in pots to move to shelter among the green-house plants.

Herbaceous Annual Sort for the Pleasure-Garden.

There are several annual sorts, but not more than one species proper as a garden plant, which is comprehensive of several varieties, known in gardens by the names of Snails, and Hedge-hogs, &c. so called from the different odd shapes of their seed-pods.

2 *MEDICAGO polymorpha*.

Polymorphous Medicago, or Snail and Hedge-hog-trefoil.]

Hath trailing herbaceous stalks, branching diffusely; garnished with trifoliate leaves, having indented stipulæ; and from the sides of the branches papilionaceous yellow flowers; and succeeded by snail-shaped pods, of many different forms in the varieties.

Varieties.] Common Snail Medicago, having large smooth pods, shaped and twisted like a snail—Hedge-hog Medicago, having large prickly snail-shaped pods, armed with spines, pointing every way like a hedge-hog—with turbinated pods—with globular pods—with orbicular pods—with long crooked pods—with double pods—with clustered pods—with twisted pods—with jagged leaves.

These plants are admitted into the pleasure-ground principally for the singularity of their seed-pods; they are hardy annuals, and easily raised from seed in the common ground.

They all flower and exhibit their singular

seed-pods in June and July, ripening seeds in autumn.

Herbaceous Perennial for Field Culture.

3 *MEDICAGO sativa*.

Cultivated Fodder-Medicago, or Lucerne.]

Hath a strong fibry, deeply-penetrating, perennial root; many upright, smooth, annual stalks, rising two or three feet high; garnished with trifoliate, alternate leaves, having spear-shaped lobes; and from the axillas racemous foot stalks of purple flowers, succeeded by contorted pods.

This species is in great estimation as an article of husbandry for fodder, and is now cultivated in fields in great plenty in many places, is of such quick growth, as often to afford four or five different cuttings every summer.

Varieties of it are,] With yellow flowers—With saffron-coloured flowers—with violet-coloured flowers—with striped flowers.

Propagation of the three Species.

First sort.—The *Medicago arborea* is propagated by seed and cuttings.

By Seed.—In March or April sow it on a warm border in shallow drills, half an inch deep; or, to bring them forwarder, may sow them in pots, and plunge them in a hot-bed just to bring up the plants an inch or two high; then harden them by degrees to the open air; in winter following, all of them raised in either method require shelter from frost; and in spring plant some singly in pots, in order to be managed as green-house plants, and plant some also out in nursery-rows, in the full ground in a dry warm situation, to take their chance the year round.

By Cuttings.—In March or April cut off some robust young shoots, form them into cuttings from six to eight or ten inches long, plant them in a bed of light rich earth, or, to forward them more, may plant some in pots and plunge them in a hot-bed; in either method, give occasional waterings, and shade from the mid-day sun; they will all be well rooted by the end of summer, and next spring they may be transplanted, some into separate pots for shelter in winter, others in nursery-rows in the full ground.

Second Sort.—The *Polymorphous Medicago* is propagated by seed, sown annually where the plants are to remain, in the latter end of March or in April. Sow them in patches towards the fronts of the borders, several seeds in each; but when the plants are come up, and a little advanced in growth, thin them to one or two of the best in each patch: they will all flower, and exhibit their seed-pods in June and July. See ANNUAL PLANTS.

Third:

Third Sort.—The cultivated *Medicago*, or Lucerne, is propagated by seed in open fields, sown commonly in drills, where the plants are to remain; and once raised, is of many years' duration.

This plant is now greatly extolled as a most excellent and profitable summer's fodder for all sorts of cattle; it comes up in great abundance, and is of such quick growth, as often to afford four or five different mowings from May until September; is generally given to the cattle green, cutting it down when from about ten to fifteen inches high, while the stalks remain soft and tender; it is also sometimes made into hay for winter use; though its chief use is to cut and eat green; for which purpose there is scarcely any plant in nature equal to it, as considering, in the first place, it presents itself very early in spring, before any other green fodder can be had, and during summer affords several distinct mowings for all sorts of cattle; therefore in consideration of the goodness of the nature of the plant as fodder, and the great abundance it affords, it highly merits culture, and succeeds in almost any soil, and the same plants continue good by the roots for many years, producing full crops annually.

It prospers best in light dry soils, and in which it is of the longest duration; for in strong, or very moist land, although it may flourish at first, yet it is often apt to go off in three or four years; whereas in suitable dry ground, the same crop will flourish for half a century, and often prospers well in any dry barren ground, where hardly any other crop will succeed.

But to proceed to its propagation, which, as already observed, is by seed in spring.

The ground is to be prepared for the reception of the seed by proper ploughing or digging; but for large quantities in fields, ploughing is the eligible tillage, repeating it as the nature of the land shall require; together with repeated harrowings, to render the soil fine for the reception of the seed, which should generally be sown in shallow drills; and the proper season is March and April.

Drill-sowing is the most commonly practiced, and is the most commendable method of sowing this seed; therefore draw shallow drills scarce an inch deep, and half a yard or two feet asunder: sow the seeds in the drills thinly with an even hand, and cover them in evenly with the earth, the depth of the drills; but this method of drill-sowing is sometimes performed with a drill-plough, furnished with a hopper, for sowing the seed as the drills are formed, covering them in the above depth;

some, however, sow the seed by broad-cast, and harrow it in, as the most expeditious method; but by drilling, the plants standing distant in rows, affords a much better opportunity of cleaning the crop from weeds by broad hoeing.

In either method of sowing, the plants will soon come up, and be ready for mowing in June or July.

Remark, however, the crop will require occasional cleaning from weeds: if in rows, it may be expeditiously performed by broad hoeing, which should be performed for the first time soon after the Lucerne comes up, and which must be repeated occasionally, especially after each mowing; but in broad-cast sown crops, the plants rising promiscuously, the hoeing cannot be so readily performed; it, however, must be done as well as possible, at the same time cutting up the weakest plants where too thick, leaving them all at proper distances for the broad-hoe to pass between, for the plants spread exceedingly, provided they have room, and each send up numerous stalks.

In June or July the Lucerne will be grown fifteen or eighteen inches high, or more, and begin to flower; when the first mowing may be performed; and the plants shooting up again strongly, afford another cutting in autumn, which is all that should be performed the first year.

The second year, however, and every year afterwards, will afford three or four cuttings at least, early in May the first crop will be ready for mowing; which may be performed when the plants are about a foot high, or a little more or less; and in a month or five weeks' interval, another such crop will be ready, and this succeeded by another, &c. but when designed to make it into hay, two or three crops may be sufficient; or it may be fed off occasionally with sheep in spring, summer, and autumn; but which should generally be taken off in winter, until about February or March.

MEDICINAL PLANTS. Plants that are used in medicine.

Vast numbers of plants possess Medicinal properties, and are used accordingly. A great many of which grow wild in this country, and great numbers are of foreign growth, and imported hither dried, from many different parts of the world; but many eminent medicinal plants are natural residents in this country, and many are also cultivated here in our gardens; the principal sorts of which are treated of as they occur in the course of this work under their proper heads.

A list,

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A list, however, of the principal Medicinal Plants of our gardens and fields, collected into one point of view in this place, may be convenient in assisting the memory in selecting the proper sorts for a collection, referring to their respective genera for their culture; we therefore exhibit in the following alphabetical arrangement, a list of the genera which furnish the most material Medicinal Plants, pointing out those species in each genus, by their respective specific names, which are the most commonly used, consisting of herbaceous perennials, biennials, and annuals, and of some trees and shrubs; remarking, that some of most of the sorts are also valuable for other uses besides medicine; some for economical uses, and some for variety and ornament in gardens; all of which are explained under their proper heads; observing also, that most of the sorts in this list are hardy enough to grow here in the open ground, some of which grow wild in the fields, &c.

ACHILLEA, Milfoil.
 ——— *Millefolium*.
 ——— *Ageratum*.
 ——— *Ptarmica*.
 ACONITUM, Monk's Hood, &c.
 ——— *Anthora*.
 ACORUS, Sweet Ruth.
 ——— *Calamus*.
 ACTÆA, Herb-Christopher.
 ——— *Spicata*.
 AGRIMONIA, Agrimony.
 ——— *Eupatoria*.
 ALCEA, Holly-hock, or Rose Mallow.
 ——— *rosea*.
 ALCHEMILLA, Lady's Mantle.
 ——— *vulgaris*.
 ALLIUM, Garlick, Onion, Leek, &c.
 ——— *sativum*.
 ——— *Scorodoprasum*.
 ——— *Victorialis*.
 ——— *Cepa*.
 ——— *Porrum*.
 ALTHÆA, Marsh Mallow.
 ——— *officinalis*.
 AMARANTHUS, *Amaranthus*.
 ——— *caudatus*.
 AMOMUM, Ginger.
 ——— *Zinziber*.
 ANCHUSA, Bugloss.
 ——— *officinalis*.
 ——— *tinctoria*.
 ANEMONE, Anemomy.
 ——— *nemorosa*.
 ——— *Hepatica*.
 ——— *Pulsatilla*.
 ANETHUM, Dill, and Fennel, &c.
 ——— *graveolens*.

M E D

ANETHUM *Fœniculum*.
 ANGELICA, *Angelica*.
 ——— *Archangelica*.
 ——— *sylvestris*.
 ——— *lucida*.
 ANTHEMIS, Chamomile.
 ——— *nobilis*.
 ——— *Cotula*.
 ANTIRRHINUM, Toad-flax.
 ——— *majus*.
 ——— *Linaria*.
 APIUM, Parsley, &c.
 ——— *Petroselinum*.
 ——— *dulce*.
 ——— *graveolens*.
 AQUILEGIA, Columbine.
 ——— *vulgaris*.
 ARISTOLOCHIA, Birthwort.
 ——— *longa*.
 ——— *rotunda*.
 ARTEMISIA, Mugwort, Wormwood, &c.
 ——— *vulgaris*.
 ——— *Abinthium*.
 ——— *Abrotanum*.
 ——— *Pontica*.
 ARUM, *Arum*.
 ——— *Dracunculus*.
 ——— *maculatum*.
 ASARUM, *Asarabacca*.
 ——— *Europæum*.
 ——— *virginicum*.
 ASCLEPIAS, Swallow-wort.
 ——— *Vincetoxicum*.
 ASPHODELUS, Asphodel.
 ——— *luteus*.
 ——— *ramosus*.
 ASTRAGALUS, Liquorice Vetch.
 ——— *Tragacantha*.
 ATRIPLEX, Orach.
 ——— *hortensis*.
 ——— *Portulacoides*.
 ATROPA, Deadly-Nightshade.
 ——— *Belladonna*.
 ——— *Mandragora*.
 BELLIS, Daisy.
 ——— *perennis*.
 BERBERIS, Berberry.
 ——— *vulgaris*.
 BETA, Beet.
 ——— *Cicla*.
 ——— *rubra*.
 BETONICA, Betony.
 ——— *officinalis*.
 BETULA, Birch.
 ——— *alba*.
 ——— *Alnus*.
 BORAGO, Borrage.
 ——— *officinalis*.
 BRYONIA, Briony.
 4 R

BRYONIA,

M E D

BRYONIA, *alba*.
 BUBON, Macedonian Parsley.
 ——— *macdonicum*.
 ——— *Galbanum*.
 CALENDULA, Marigold.
 ——— *officinalis*.
 CAPSICUM, *Capsicum*.
 ——— *annuum*.
 CARDAMINE, Lady's Smock.
 ——— *pratensis*.
 CARTHAMUS, Bastard Saffron.
 ——— *lanata*.
 ——— *tinctoria*.
 CARUM, Caraway.
 ——— *Carui*.
 CENTAUREA, Centaury.
 ——— *Centaureum*.
 ——— *Benedictus* (*Carduus Benedictus*.)
 CHENOPODIUM, Wild Orach.
 ——— *Bonus Henricus*.
 ——— *Batrach*.
 CICHORUM, Succory, or Endive.
 ——— *Endiva*.
 CISTUS, Rock-rose.
 ——— *creticus*.
 ——— *albus*.
 COCHLEARIA, Spoon-wort, Scurvy-grass.
 ——— *officinalis*.
 ——— *anglica*.
 ——— *Armoracia*.
 CONVALLARIA, Lily of the Valley.
 ——— *majalis*.
 ——— *Polygonatum*.
 CORIANDRUM, Coriander.
 ——— *sativum*.
 CRATÆGUS, Wild Service, &c.
 ——— *Aria*.
 ——— *Oxyacantha*.
 CRITHMUM, Samphire.
 ——— *maritimum*.
 CROCUS, Saffron.
 ——— *sativus*.
 CYCLAMEN, Sow-bread.
 ——— *europæum*.
 CYNARA, Artichoke.
 ——— *Scolymus*.
 CYNOGLOSSUM, Hound's-tongue.
 ——— *officinale*.
 DAPHNE, Spurge, Laurel, &c.
 ——— *Laureola*.
 ——— *Mézerion*.
 DATURA, Thorn Apple (*Stramonium*).
 ——— *Metel*.
 ——— *Stramonium*.
 DAUCUS, Carrot.
 ——— *Carota*.
 DIANTHUS, Clove-gilliflower.
 ——— *Caryophyllus*.

M E D

DICTAMNUS, Dittany.
 ——— *albus*.
 DIGITALIS, Fox-glove.
 ——— *purpurea*.
 DRACOCEPHALUM, Dragon's-head.
 ——— *canariense*.
 ——— *Moldavica*.
 ERYNGIUM, *Eryngo*, or Sea-holly.
 ——— *maritimum*.
 ——— *aquaticum*.
 EUONYMUS, Spindle-tree.
 ——— *europæus*.
 EUPATORIUM, Hemp-Agrimony.
 ——— *cannabinum*.
 FAGUS, Beech-tree.
 ——— *sylvatica*.
 ——— *Castanea*.
 FRAGARIA, Strawberry.
 ——— *Vesca*.
 FUMARIA, Fumatory.
 ——— *bulbosa*.
 ——— *officinalis*.
 GENISTA, Dyer's Broom.
 ——— *tinctoria*.
 ——— *canariensis*.
 GENTIANA, Gentian.
 ——— *lutea*.
 GLECHOMA, Ground-ivy.
 ——— *Hederacea*.
 GLYCYRRHIZA, Liquorice.
 ——— *glabra*.
 HEDERA, Ivy.
 ——— *Helix*.
 HELLEBORUS, Hellebore.
 ——— *fœtidus*.
 ——— *niger*.
 HUMULUS, Hop-plant.
 ——— *Lupulus*.
 HYACINTHUS, Hyacinth.
 ——— *Nonscriptus*.
 HYSSOPUS, Hyssop.
 ——— *officinalis*.
 INULA, Elecampane.
 ——— *Helenium*.
 JUNIPERUS, Juniper.
 ——— *communis*.
 ——— *Sabina*.
 LACTUCA, Lettuce.
 ——— *sativa*.
 LAVANDULA, Lavender.
 ——— *Spica*.
 ——— *Stachas*.
 LAURUS, Bay.
 ——— *nobilis*.
 ——— *Sassafras*.
 LIGUSTICUM, Lovage.
 ——— *Levisticum*.
 LIGUSTRUM, Privet.
 ——— *vulgare*.

LILIUM;

LILIUM, Lily.
 — *candidum*.
 LUPINUS, Lupine.
 — *albus*.
 MALVA, Mallow.
 — *Alcea*.
 — *sylvestris*.
 — *rotundifolia*.
 MARANTA, Arrow-root.
 — *Galanga*.
 MARRUBIUM, Hore-hound.
 — *vulgare*.
 MATRICARIA, Feverfew.
 — *Parthenium*.
 MELISSA, Balm.
 — *officinalis*.
 — *Calamintha*.
 MENTHA, Mint.
 — *viridis*.
 — *sylvestris*.
 — *Piperita*.
 — *Pulegium*.
 — *Cervina*.
 MESPILUS, Medlar.
 — *germanica*.
 MIRABILIS, Marvel of Peru.
 — *Jalapa*.
 — *dichotoma*.
 MORUS, Mulberry.
 — *nigra*.
 MYRTUS, Myrtle.
 — *communis*.
 NARCISSUS, Daffodil.
 — *Pseudo-narcissus*.
 NIGELLA, Fennel-flower.
 — *sativa*.
 NEPETA, Nep, or Cat-Mint.
 — *Cataria*.
 NICOTIANA, Tobacco.
 — *Tabacum*.
 — *rustica*.
 NYMPHÆA, Water-Lily.
 — *alba*.
 OCYUM, Basil.
 — *Basilicum*.
 OPHIOGLOSSUM, Adder's-Tongue.
 — *vulgatum*.
 ONONIS, Rest-Harrow.
 — *spinosa*.
 ORCHIS, Fool's-Stones.
 — *bifolia*.
 — *mascula*.
 ORIGANUM, Origany, Marjoram.
 — *Marjorana*.
 — *vulgare*.
 — *Dictamnus*.
 OXYLAS, Wood-sorrel.
 — *Acetosella*.
 PÆONIA, Peony.

PÆONIA *officinalis*.
 PAPAVER, Poppy.
 — *somniferum*.
 — *Rhœas*.
 PHYSALIS, Winter-cherry.
 — *Alkekengi*.
 — *viscosa*.
 PIMPINELLA, Burnet-Saxifrage, Aniseed,
 &c.
 — *anisum*.
 — *Saxifraga*.
 PINUS, Pine-tree, Fir, &c.
 — *Picea*.
 — *Abies*.
 — *Larix*.
 POLYGONUM, Knot-grass.
 — *Bistorta*.
 — *Perficaria*.
 — *Hydropiper*.
 POPULUS, Poplar.
 — *nigra*.
 — *Tacamahacca*.
 PORTULACA, Purslane.
 — *oleracea*.
 POTERIUM, Burnet.
 — *Sanguisorba*.
 PRIMULA, Primrose.
 — *veris*.
 PRUNUS, Plum-tree.
 — *spinosa*.
 — *Lauro-cerasus*.
 — *Damascena*.
 PYRUS, Pear-tree.
 — *Cydonia*.
 — *Malus sylvestris*.
 RAPHANUS, Radish.
 — *sativa*.
 RHAMNUS, Buck-thorn.
 — *Catharticus*.
 — *Frangula*.
 RHEUM, Rhubarb.
 — *palmatum*.
 — *Rhaponticum*.
 — *undulatum*.
 RIBES, Currant, &c.
 — *nigra*.
 — *rubra*.
 — *Grossularia*.
 RICINUS, Palma Christi.
 — *communis*.
 ROSA, Rose.
 — *alba*.
 — *damascena*.
 — *canina*.
 ROSMARINUS, Rosemary.
 — *officinalis*.
 RUMEX, Dock, Sorrel, &c.
 — *Patientia*.
 — *Acetosa*.

M E D

BRYONIA, *alba*.
 BUBON, Macedonian Parsley.
 ——— *macedonicum*.
 ——— *Galbanum*.
 CALENDULA, Marigold.
 ——— *officinalis*.
 CAPSICUM, *Capficum*.
 ——— *annuum*.
 CARDAMINE, Lady's Smock.
 ——— *pratensis*.
 CARTHAMUS, Bastard Saffron.
 ——— *lanata*.
 ——— *tinctoria*.
 CARUM, Caraway.
 ——— *Carui*.
 CENTAUREA, Centaury.
 ——— *Centaureum*.
 ——— *Benedictus* (*Cardus Bene-*
 dictus.)
 CHENOPODIUM, Wild Orach.
 ——— *Bonus Henricus*.
 ——— *Batrys*.
 CICHORUM, Succory, or Endive.
 ——— *Endiva*.
 CISTUS, Rock-rose.
 ——— *creticus*.
 ——— *albus*.
 COCHLEARIA, Spoon-wort, Scurvy-grass.
 ——— *officinalis*.
 ——— *anglica*.
 ——— *Armoracia*.
 CONVALLARIA, Lily of the Valley.
 ——— *majalis*.
 ——— *Polygonatum*.
 CORIANDRUM, Coriander.
 ——— *fativum*.
 CRATÆGUS, Wild Service, &c.
 ——— *Aria*.
 ——— *Oxyacantha*.
 CRITHMUM, Samphire.
 ——— *maritimum*.
 CROCUS, Saffron.
 ——— *fativus*.
 CYCLAMEN, Sow-bread.
 ——— *europæum*.
 CYNARA, Artichoke.
 ——— *Scolymus*.
 CYNOGLOSSUM, Hound's-tongue.
 ——— *officinale*.
 DAPHNE, Spurge, Laurel, &c.
 ——— *Laureola*.
 ——— *Mezereon*.
 DATURA, Thorn Apple (*Stramonium*).
 ——— *Metel*.
 ——— *Stramonium*.
 DAUCUS, Carrot.
 ——— *Carota*.
 DIANTHUS, Clove-gilliflower.
 ——— *Caryophyllus*.

M E D

DICTAMNUS, Dittany.
 ——— *albus*.
 DIGITALIS, Fox-glove.
 ——— *purpurea*.
 DRACOCEPHALUM, Dragon's-head.
 ——— *canariense*.
 ——— *Moldavica*.
 ERYNGIUM, *Eryngo*, or Sea-holly.
 ——— *maritimum*.
 ——— *aquaticum*.
 EUONYMUS, Spindle-tree.
 ——— *europæus*.
 EUPATORIUM, Hemp-Agrimony.
 ——— *cannabinum*.
 FAGUS, Beech-tree.
 ——— *sylvatica*.
 ——— *Castanea*.
 FRAGARIA, Strawberry.
 ——— *Vesca*.
 FUMARIA, Fumatory.
 ——— *bulbosa*.
 ——— *officinalis*.
 GENISTA, Dyer's Broom.
 ——— *tinctoria*.
 ——— *canariensis*.
 GENTIANA, Gentian.
 ——— *lutea*.
 GLECHOMA, Ground-ivy.
 ——— *Hederacea*.
 GLYCYRRHIZA, Liquorice.
 ——— *glabra*.
 HEDERA, Ivy.
 ——— *Helix*.
 HELLEBORUS, Hellebore.
 ——— *fætidus*.
 ——— *niger*.
 HUMULUS, Hop-plant.
 ——— *Lupulus*.
 HYACINTHUS, Hyacinth.
 ——— *Nonscriptus*.
 HYSSOPUS, Hyssop.
 ——— *officinalis*.
 INULA, Elecampane.
 ——— *Helenium*.
 JUNIPERUS, Juniper.
 ——— *communis*.
 ——— *Sabina*.
 LACTUCA, Lettuce.
 ——— *fativa*.
 LAVANDULA, Lavender.
 ——— *Spica*.
 ——— *Stæchas*.
 LAURUS, Bay.
 ——— *nobilis*.
 ——— *Sassafras*.
 LIGUSTICUM, Lovage.
 ——— *Levisticum*.
 LIGUSTRUM, Privet.
 ——— *vulgare*.

LILIUM;

LILIUM, Lily.
 ——— *candidum*.
 LUPINUS, Lupine.
 ——— *albus*.
 MALVA, Mallow.
 ——— *Alcea*.
 ——— *sylvestris*.
 ——— *rotundifolia*.
 MARANTA, Arrow-root.
 ——— *Galanga*.
 MARRUBIUM, Hore-hound.
 ——— *vulgare*.
 MATRICARIA, Feverfew.
 ——— *Parthenium*.
 MELISSA, Balm.
 ——— *officinalis*.
 ——— *Calamintha*.
 MENTHA, Mint.
 ——— *viridis*.
 ——— *sylvestris*.
 ——— *Piperita*.
 ——— *Pulegium*.
 ——— *Cervina*.
 MESPILUS, Medlar.
 ——— *germanica*.
 MIRABILIS, Marvel of Peru.
 ——— *Jalapa*.
 ——— *dichotoma*.
 MORUS, Mulberry.
 ——— *nigra*.
 MYRTUS, Myrtle.
 ——— *communis*.
 NARCISSUS, Daffodil.
 ——— *Pseudo-narcissus*.
 NIGELLA, Fennel-flower.
 ——— *sativa*.
 NEPETA, Nep, or Cat-Mint.
 ——— *Cataria*.
 NICOTIANA, Tobacco.
 ——— *Tabacum*.
 ——— *rustica*.
 NYMPHÆA, Water-Lily.
 ——— *alba*.
 OCYUM, Basil.
 ——— *Basilicum*.
 OPHIOGLOSSUM, Adder's-Tongue.
 ——— *vulgatum*.
 ONONIS, Rest-Harrow.
 ——— *spinosa*.
 ORCHIS, Fool's-Stones.
 ——— *bifolia*.
 ——— *mascula*.
 ORIGANUM, Origany, Marjoram.
 ——— *Marjorana*.
 ——— *vulgare*.
 ——— *Dictamnus*.
 OXYLAS, Wood-sorrel.
 ——— *Acetosella*.
 PÆONIA, Peony.

PÆONIA *officinalis*.
 PAPAVER, Poppy.
 ——— *somniferum*.
 ——— *Rhæas*.
 PHYSALIS, Winter-cherry.
 ——— *Alkekengi*.
 ——— *viscosa*.
 PIMPINELLA, Burnet-Saxifrage, Aniseed,
 &c.
 ——— *anisum*.
 ——— *Saxifraga*.
 PINUS, Pine-tree, Fir, &c.
 ——— *Picea*.
 ——— *Abies*.
 ——— *Larix*.
 POLYGONUM, Knot-grass.
 ——— *Bistorta*.
 ——— *Perficaria*.
 ——— *Hydropiper*.
 POPULUS, Poplar.
 ——— *nigra*.
 ——— *Tacamahacca*.
 PORTULACA, Purslane.
 ——— *oleracea*.
 POTERIUM, Burnet.
 ——— *Sanguisorba*.
 PRIMULA, Primrose.
 ——— *veris*.
 PRUNUS, Plum-tree.
 ——— *spinosa*.
 ——— *Lauro-cerasus*.
 ——— *Damascena*.
 PYRUS, Pear-tree.
 ——— *Cydonia*.
 ——— *Malus sylvestris*.
 RAPHANUS, Radish.
 ——— *sativa*.
 RHAMNUS, Buck-thorn.
 ——— *Catharticus*.
 ——— *Frangula*.
 RHEUM, Rhubarb.
 ——— *palmatum*.
 ——— *Rhaponticum*.
 ——— *undulatum*.
 RIBES, Currant, &c.
 ——— *nigra*.
 ——— *rubra*.
 ——— *Grossularia*.
 RICINUS, Palma Christi.
 ——— *communis*.
 ROSA, Rose.
 ——— *alba*.
 ——— *damascena*.
 ——— *canina*.
 ROSMARINUS, Rosemary.
 ——— *officinalis*.
 RUMEX, Dock, Sorrel, &c.
 ——— *Patientia*.
 ——— *Acetosa*.

M E D

RUSCUS, Knee-holly, Butcher's-broom, &c.
 ————— *aculeatus*.
 ————— *Hypoglossum*.
 ————— *Hypophyllum*.
RUTA, Rue.
 ————— *graveolens*.
SALVIA, Sage, Clary, &c.
 ————— *officinalis*.
 ————— *Sclarea*.
 ————— *Horminum*.
SAMBUCUS, Elder-tree.
 ————— *Ebulus*.
 ————— *nigra*.
SANTOLINA, Lavender-cotton.
 ————— *Chama-cyparissus*.
SATUREJA, Savory.
 ————— *hortensis*.
 ————— *montana*.
SCANDIX, Chervil.
 ————— *Cerrefolium*.
 ————— *odorata*.
SCILLA, Sea-onion.
 ————— *maritima*.
SCORZONERA, Scorzonera.
 ————— *humilis*.
SEDUM, Orpine, Lesser House-leek, &c.
 ————— *Telephium*.
SEMPERVIVUM, Live-ever, Greater House-leek, &c.
 ————— *tefforum*.
SINAPIS, Mustard.
 ————— *alba*.
 ————— *nigra*.
SIMUM, Skirret.
 ————— *Sisarum*.
SMYRNIUM, Alexanders.
 ————— *Olusatrum*.
SOLANUM, Night-shade.
 ————— *Dulcamara*.
 ————— *Lycopersicon*.
SOLIDAGO, Golden Rod.
 ————— *Virga aurea*.
SORBUS, Service-tree.
 ————— *domestica*.
SPARTIUM, Broom.
 ————— *scoparium*.
SPINACIA, Spinach.
 ————— *oleracea*.
SPIRÆA, Filipendula.
STACHYS, Bala Hore-hound, All-heal, &c.
 ————— *palustris*.
STATICE, Sea-pink, or Thrift.
 ————— *Limonium*.
SYMPHYTUM, Comfrey.
 ————— *officinalis*.
TAMARIX, Tamarisk-tree.
 ————— *gallica*.
TAMUS, Black-Briony.
 ————— *communis*.

M E L

TANACETUM, Tansey.
 ————— *vulgare*.
TEUCRIUM, Germander.
 ————— *Marum*.
THUJA, Tree of Life (*Arbor Vitæ*).
 ————— *occidentalis*.
THYMUS, Thyme.
 ————— *vulgaris*.
 ————— *Serpyllum*.
TRAGOPOGON, (Goat's-beard) Salsafy.
 ————— *porrifolium*.
 ————— *pratense*.
TRIFOLIUM, Trefoil.
 ————— *officinale*.
TUSSILAGO, Colt's-foot.
 ————— *Farfara*.
VACCINIUM, Bilk-berry, or Whortle-berry.
 ————— *Myrtillus*.
 ————— *Oxycoccus*.
VALERIANA, Valerian.
 ————— *Phu*.
 ————— *officinalis*.
VERATRUM, White Hellebore.
 ————— *album*.
VERONICA, Speed-well.
 ————— *officinalis*.
 ————— *Beccabunga*.
VIBURNUM, Wayfaring-tree.
 ————— *Lantana*.
VIOLA, Violet.
 ————— *odorata*.
 ————— *tricolor*.
VISNUM, Mistletoe.
 ————— *album*.
VITEX, Chaste-tree.
 ————— *Agnus castus*.

The above list of Medicinal Plants, by being collected from the different parts of the work under one head, will greatly assist the memory in making a collection of these kinds, or for procuring them for use; many of which, however, possess a considerable share of merit for other domestic uses, as well as for variety and ornament in gardens, as before suggested; all of which, together with their general culture, is fully explained under their respective genera, as above, as they alphabetically arrange in the course of the work.

MELASTOMA, American Gooseberry.

A genus of ever-green tree and shrub, exotics of America and Asia, &c. for the hot-house; adorned with large, oblong, oval, cordate, and lanceolate, nervous, and downy leaves; and spikes and clusters of whitish and purple flowers, at the sides and ends of the branches; having monophyllous, swelling, permanent cups, five roundish petals, ten short stamina, a roundish germen, under the corolla, and one style; succeeded, in the germen,

men, by a quinquelocular-berry, filled with many small seeds.

Class and order, *Decandria Monogynia*.

The principal species are,

1. MELASTOMA *Grossularoides*.

(*Grossularoides*)—or *American Gooseberry of Surinam*.] With ovate, denticulated, acute-pointed, trinervous leaves.

2. MELASTOMA *holosericum*.

Satiny-leaved Melastoma of Brazil.] With oblong-ovate, three-nerved, entire leaves, downy and satiny underneath; and two-parted spikes.

3. MELASTOMA *laevigatum*.

Smooth-leaved American Melastoma.] With ovate-oblong, five-nerved, pointed, entire leaves, having polished margins.

4. MELASTOMA *scabrosum*.

Rugged Jamaica Melastoma.] With downy, villous branches; heart-shaped, dentated, five-nerved, rugged leaves, downy underneath.

5. MELASTOMA *asperum*.

Rough Indian Melastoma.] With spear-shaped, three-nerved, rough, entire leaves.

6. MELASTOMA *hirtum*.

Hairy American Melastoma.] With hispid stalks; large ovate-lanceolate, five-nerved, denticulate leaves.

7. MELASTOMA *ostandrum*.

Ostandrous Indian Melastoma.] With ovate, three-nerved, smooth entire leaves, having hispid margins.

These exotic shrubs are retained in principal stove collections in this country, having singular beauty as ever-greens; though the first two or three sorts are the most noted in the British gardens, and more generally the second species; but all the sorts display an admirable variety in their fine foliage, being mostly large, and of various tints and hues; some having the under side white and silky, gold-coloured, russety, &c. with the upper surfaces of different shades of green, effecting a fine diversity the year around; and produce their spikes and clusters of flowers in summer; but rarely ripen seeds, in this country.

They are planted in pots of common good lightish earth, and have the general culture of other woody exotics of the stove, and are propagated by seeds obtained from abroad, or sometimes by layers and cuttings; all by the assistance of a bark-bed.

MELIA, (*Azedarach*) Bead-tree.

This genus consists of some deciduous and ever-green exotic trees of the Indies, proper for the shrubbery, green-house, and stove; rising near twenty feet high; adorned with large pinnated or winged leaves, and clusters of pentapetalous flowers.

Class and order, *Decandria Monogynia*.

Characters.] CALYX is small, monophyllous, and five-parted. COROLLA, five long, narrow, spear-shaped, spreading petals, a cylindric, monopetalous nectarium much indented at the brim. STAMINA, ten very small filaments inserted into the top of the nectarium, and small oblong antheræ. PISTILLUM, a conical germen, cylindric style, and capitated quadrivalvular stigma. PERICARPIUM, a globular drupaceous fruit, containing a roundish, five-furrowed, quinquelocular nut, each cell having one seed.

There are but two species, one of which is a deciduous tree for the green-house and shrubbery, having an ever-green variety for the stove; and the other species is also of the temperature of stove-plants.

Shrubbery and Green-house Kinds.

1. MELIA *Azedarach*.

(*Azedarach*)—or common *Deciduous Bead-tree*.] Rises with an upright robust stem, branching widely all around, about twenty feet high; large bipinnated, or double-winged deciduous leaves, of numerous folioles, each wing terminated by an odd one; and from the sides of the branches long bunches of small blue flowers, succeeded by roundish-oblong, deeply five-furrowed, yellowish fruit, not eatable.

The fruit of this plant in catholic countries is strung like beads, to compose some sort of rosaries; whence the name of Bead-tree.

This shrub is cultivated here sometimes in the shrubbery, but more commonly as a green-house plant; for, being a native of hot countries, in these parts it is rather tender. Some should be kept in pots to have shelter in severe weather, as a reserve, in case those in the shrubbery should be destroyed.

It is very ornamental in its large, compound, doubly-winged foliage, which are often near two-feet long.

Hot-house Kinds.

Variety.] (*Melia Azedarach*).

Ever-green Semperflorous, Common Bead-tree of Ceylon.] Hath an upright stem, branching widely all around, about twenty feet high; large, bipinnated, ever-green leaves; and long paniculated bunches of bluish flowers, succeeded by roundish purple fruit; flowers always, or at least most part of the year.

2. MELIA *azadirachta*.

Azadirachta, or Indian Ever-green Bead-tree.] Hath an upright robust stem, branching widely, and grows twenty feet high or more, covered with a dark-purple bark; pinnated or singly-winged leaves, of five or six pair of oblong.

oblong lobes, terminated by an odd one; and from the branches long paniculated bunches of white flowers, succeeded by oval, olive-shaped, purple fruit, not eatable.

The flowers of all these shrubs are separately small, each of five spreading petals; but many being collected into long clusters, they are tolerably conspicuous.

All the three sorts merit culture in every garden accommodated with proper conveniences, they being very ornamental in their pinnated foliage.

The first sort, however, will succeed tolerably in the open ground in a dry warm situation, though it is rather subject to be hurt by severe frost: it is nevertheless proper to have some always in every curious shrubbery, to take their chance of all weathers, where, by the display of their elegant bipinnated foliage, they will effect a very distinguishable variety: it is also proper to have some always in pots, and managed as green-house plants, both to increase the variety, and be as a reserve in case those fully exposed should be killed in severe weather.

But the other two sorts, the ever-green variety of the common Bead-tree, and the *Azadirachta*, being natives of very hot countries, require the almost constant aid of our stoves here.

The propagation of all the sorts is by seed, assisted by hot-beds.

First Sort.—The seeds are obtained from abroad, and generally arrive in spring, which sow in pots of light rich earth, and plunge them in a hot-bed of tanner's-bark or dung, under frame and glasses; in which they will come up in a month or six weeks, giving frequent waterings, and fresh air; and in June should be fully exposed in a moderate shade until October, then placed under a frame, &c. there to enjoy the free air all winter in open weather, and sheltered from frost; and in March following plant them in separate small pots, which plunge in a bark-bed, &c. though this is not absolutely necessary, but if practised, it will greatly facilitate their rooting and first effort of growth; observing to indulge them freely with fresh air; and in June, as before observed, move them into it fully for the remainder of the summer, and allow them shelter again in winter, as above: which after being repeated three or four years, shifting them occasionally into larger pots, some of the strongest and most woody plants may be committed to the full ground under a warm wall, or in a dry sheltered part of the shrubbery; and the proper season for this work is the first fortnight in April; reserve a

quantity also in pots, to have the management of green-house exotics, lest those in the open ground should be cut off by the frost.

Second and Third Sorts.—Both these sorts are also propagated by seeds, sown in pots and plunged in the bark-bed, and managed nearly as the first sort, only as being of much more tender quality, must be kept always in pots, and plunged in the tan-bed in the stove during their infant state; afterwards, having acquired some considerable size and strength, they may be placed in the open air for about two months in the heat of summer, and the rest of the year in the hot-house; manage them as other woody exotics of that department. See STOVE PLANTS.

MELIANTHUS, Honey-flower.

Two tall, ligneous, floriferous, perennial exotics for the green-house and shrubbery, constitute this genus, rising with durable ligneous stalks, four or five feet high or more; ornamented with large winged leaves, and terminated by long spikes of tetrapetalous flowers.

Class and order, *Didynamia Angiospermia*.

Characters.] CALYX is large, unequal, five-parted, and coloured. COROLLA, four spear-shaped, narrow, spreading, reflexed-pointed petals, and a monophyllous, short, compressed, indented nectarium, situated in the lower segment of the calyx. STAMINA, two long and two shorter filaments, and oblong, heart-shaped antheræ. PISTILLUM, a four-cornered germen, erect style, and quadrifid stigma. PERICARPIUM, a quadrangular, semi-quadrifid capsule, having acute, distinct angles, and divided by partitions into distended cells, each having one globular seed.

There are but two species, both natives of Africa, and being rather of a tender nature, are very commonly treated as green-house plants; but they will also often succeed all the year in the open ground, in warm dry situations; it is, however, proper to cultivate some by both methods.

The species are,

1. MELIANTHUS major.

Greater Melianthus, or Honey-flower.] Hath a thick, ligneous, spreading root; many upright, ligneous, durable stalks, rising six or eight feet high; garnished with large pinnated leaves, of four or five pair of serrated lobes, terminated by an odd one, and have single stipulæ growing close to the foot-stalks; and from the sides and top of the stalks long spikes of chocolate-coloured flowers.

2. MELIANTHUS minor.

Lesser Melianthus, or Honey-flower.] Hath a thick, ligneous, somewhat spreading root; upright, ligneous, soft, durable stalks, rising four

four or five feet high, garnished with smaller pinnated leaves, of four or five pair of folioles, terminated by an odd one, and have two distinct stipulæ; and from the sides and ends of the branches long, loose, pendulous bunches of flowers tinged with green, saffron-colour, and red.

Both the species flower about June; each flower is of four spear-shaped spreading petals; and each plant produces many flowers annually, but rarely are succeeded by seeds in England.

The plants are very ornamental, both in foliage and flowers, and merit admittance in every collection.

They are durable both in root and stalk, for although the stems are somewhat of an herbaceous nature, they become woody and abiding, more especially if sheltered occasionally in winter; but those fully exposed are sometimes killed down to the ground in severe weather; but the roots generally remaining sound, send up new stalks again in the following spring.

Considered as green-house plants, it is proper to keep some always in pots to have shelter in winter, in case those in the open ground should be destroyed.

And for the pleasure-garden, plant some in a dry soil, in a sheltered warm exposure.

Their propagation is easily effected by suckers, and cuttings.

By Suckers.—These rise in tolerable plenty from the root, especially of the first sort; and may be taken up in autumn or spring, with root-fibres, and planted some in pots for the green-house, others in a warm dry part of the nursery, &c.

By Cuttings.—In spring or summer take off a quantity of young cuttings towards the tops of the stalks or branches, plant them in pots, and plunge them in a hot-bed, giving waterings; they will readily put out roots: or in default of a hot-bed, cover them close with hand-glasses, giving occasional shade, they will also take root; managing them afterwards as directed for the suckers.

MELISSA, Balm.

It furnishes hardy, fibrous-rooted; herbaceous perennials, for medical uses, and variety in gardens, rising with upright slender stalks, from one to two or three feet high, garnished with simple, oblong, opposite leaves, and verticillate clusters of small monopetalous ringent flowers.

Class and order, *Didynamia Gymnospermia*.

Characters.] CALYX is monophyllous, bell-shaped, angular, bilabiated at top, and permanent. COROLLA is monopetalous, with a cylindric tube, and ringent above; having the

upper lip short, round, erect, arched, and indented in two, the lower one trifid, with the middle part largest. STAMINA, two longer and two shorter filaments, and small antheræ that join by pairs. PISTILLUM, a quadrifid germen, slender style; the length of the corolla, situated with the stamina under the upper lip, and a bifid reflexed stigma. PERICARPIUM, none; four naked seeds lodged in the permanent calyx.

There are several species; but the following perennials are the only sorts for general notice.

1. MELISSA *officinalis*.

Common Officinal Balm.] Hath fibry perennial roots; many upright, square, branchy, annual stalks, rising two or three feet high; garnished with oblong, indented, opposite leaves, by pairs, two or three inches long, and half as broad; and from the upper axillas verticillate clusters of small white flowers, upon single foot-stalks.

Variety.] With variegated leaves.

The common Balm is a valuable medical plant, the virtues of which are universally known, and ought to be allowed a place in every garden, and may be increased in great plenty by parting the roots.

The variegated kind exhibits an agreeable variety in the pleasure-garden.

2. MELISSA *grandiflora*.

Grandiflorous Melissa, or *Hetrurian Calaminth*.] Hath fibry perennial roots; upright annual stalks, rising about a foot high; garnished with oblong-oval, indented, hairy, opposite leaves; and from the upper axillas verticillate clusters of large purple flowers, on forked foot-stalks.

Varieties.] White-flowered—red-flowered.

3. MELISSA *calamintha*.

(*Calamintha vulgaris*)—or Common Calaminth of the Shops.] Hath fibry perennial roots; upright, square, branchy, hairy stalks, rising a foot high; roundish, indented, opposite leaves; and verticillate clusters of small bluish flowers, on forked foot-stalks as long as the flowers.

Variety.] Striped-leaved.

All these three species of *Melissa* flower in June and July; the flowers are ringent, labiated, and disposed in verticilli, or whorls, in small heads, or clusters, going quite round the stem, on short foot-stalks (see VERTICILLUS); and are succeeded by ripe seeds in autumn; but these are hardly ever wanted, since all the sorts multiply greatly by root.

They are all perennial in root, but annual in stalk, and all so hardy as that they will grow in almost any soil and situation.

The plants are fragrant, warm, and accounted

counted cordial and cephalic; their chief virtue resides in the leaves.

As to their merit in gardens, they are proper both for use and ornament.

The *Melissa officinalis*, or common Balm, merits a place in every garden for its admirable medical qualities, valuable on many domestic occasions; and is easily propagated by slipping the roots, and should be disposed in the kitchen-garden among the aromatics, in rows about a foot asunder (see the *Propagation*); and its variegated sort may be disposed in the pleasure-ground. So refreshing is the smell of both the varieties, so salutary and cooling when made into tea, by way of medicine, that they have the first claim to a place in our gardens. Great quantities of the common green sort are cultivated in the gardens about London for supplying the markets, and it is of such quick growth, that it often affords three or four cuttings each summer, to cut young for immediate use; though, when wanted for principal medical purposes, or to dry for keeping, it should generally stand till arrived nearly at full growth, and just beginning to flower; then cut it in dry weather, and dry it in the shade, as directed for mint. See MENTHA.

The second sort is commonly introduced into pleasure-gardens, as a plant of ornament and variety.

But the third sort is chiefly considered as a medical plant, though inferior to the common Balm, for occasional domestic purposes; and as it grows wild in England, is rarely cultivated, except in physic gardens.

Propagation of all the Sorts.

The propagation of all the sorts is effected plentifully by parting the roots, which increase exceedingly by off-sets annually.

Autumn or spring is the proper season for this work, though it may be done any time in open weather, from the decay of the stalk in autumn, until spring, before new ones begin to arise; the most eligible season, however, is September or October, that the off-sets may take good root before winter, and be firmly established against spring; particularly the common Balm; though it may be done successfully in either of those seasons, as shall be convenient.

The method is, the whole root may either be taken up and divided into as many slips as are furnished with fibres; or the main root may stand, and slip off a quantity of off-sets around the outside; plant those of the common sort, &c. for use, in the kitchen-garden, in borders or beds, in rows a foot or eighteen inches asunder, and a foot distance in each row; they will spread and increase into large

bunches the following summer, and afford a good cutting or two the same year; or in spring, just as the Balm begins to shoot, may slip off a quantity of the young shoots of the season, of one, two, or three inches' growth, slipping them close to the root, and planted in any bed or border, a foot asunder, and watered; they will grow freely, and form good plants the same year, for plentiful gathering in summer, as above; observing, in the propagation of those intended for variety and ornament, such as the variegated common Balm, and the grandiflorous kind, they being parted in large off-set slips, may be planted at once to remain; dispersed singly in the borders or other compartments intended.

All the culture these plants require is keeping them clean from weeds, and cutting down all remaining stalks in autumn; at which time also clear off all weeds from the beds of common Balm, and dig the alleys, and spread a little of the earth over the surface of the beds between the plants, whereby the beds will remain neat all winter, and it will prove beneficial to the plants.

A plantation of Balm will remain in good condition several years; though if renewed every third or fourth year, you will thereby more effectually continue a succession of crops in full perfection.

MELONARY, or Melon-Ground.

A compartment in the kitchen-garden, sometimes inclosed distinct, allotted principally for the business of early and general hot-bed work, both in the culture of melons and cucumbers, and occasionally in most other framing in the hot-bed culture, necessary in raising various early esculents, some to attain perfection for use in the hot-beds, others forwarded in a small growth for pricking or transplanting therefrom, as well as in raising many sorts of curious and tender exotic plants, flowers, &c. which cannot be cultivated in this country without the aid of such artificial heat: but as this district in its original principal designation being appropriated chiefly to the culture of melons aforesaid, and early cucumbers, it is commonly called the Melon-Ground, especially in principal private or family gardens.

This district of gardening, the Melon-Ground, designed solely or principally for that business and general hot-bed framing, is very eligible, as being a particular and principal branch of horticulture, which generally requires a distinct situation allotted and adapted to that purpose, both as a particular mode of culture is necessary in the management of hot-beds, different from that of natural ground crops, and that, as, in the process of hot-bed work,

work, there being unavoidably a considerable littering occasioned at times, by means of the necessary supplies of hot-dung, straw-litter, and other requisites for the hot-beds, both in making and after culture; which being confined to a particular district, the whole is performed therein without incommoding the economy of the other parts of the garden; as likewise an allotted district is necessary, properly chosen, in the driest and warmest situation, both for the particular advantage of having the hot-beds on dry ground, very essential in winter, and to have all possible advantage of shelter from cutting winds, and enjoy the full benefit of the whole day's sun: and also a distinct compartment, for this occasion, may be additionally necessary in some places, where it may be thought expedient to have the whole separately inclosed, either for greater shelter, or sometimes by way of security, having a gate to lock occasionally when it may seem eligible.

Sometimes in considerable gardens the place allotted for the Melon-Ground, &c. is of some capacious extent, in which to have also the hot-house, forcing houses, and other appurtenances of that kind, whereby to have all the relative culture by artificial heat near together in one particular compartment; as in many cases the different hot-beds, bark-beds, hot-houses, &c. have some connection less or more in the culture of particular sorts of their respective plants, at some certain period of their growth: so that the whole may be more convenient in general and particular relative occasions, as just intimated.

However, in the choice of a place for the Melon-Ground, should generally appropriate a part of some warmest, well-sheltered, dry quarter of the kitchen-garden in the full sun, where best defended from the northerly and north-east winds, and where the ground is dry at all seasons, not liable to inundation or apt to lodge standing water, in winter, or any time after heavy or incessant rains, snow, &c. and as conveniently situated as possible for bringing in the requisite supplies of dung, tan, earth, &c. for the hot-beds.

And if, with the above accommodations, the ground lies rather a little higher or very gently sloping towards some lower part, it will be some additional advantage, so as more effectually to shoot off casual very copious moisture of collected water after excessive rains, &c. whereby to continue the place always as dry as possible; being considerably essential in this business, both in the general work of making the hot-beds, and beneficial in continuing them longer in a proper tem-

perature of heat, than when the ground is liable to standing water, which chills the bottom part of the hot-beds and thereby causes a great decay of the general heat upward; and therefore, it is essentially necessary to allow a compartment as dry as the situation of the garden admits, both for the above advantages and that of commodiously performing the general daily management of the hot-beds in the most effectual manner.

In the whole, should fix on a place that lies well to the full sun from rising to setting, so as to admit of ranging the hot-beds longitudinally east and west, or as nearly in that direction as the situation of the ground admits, that when the frames and glasses are placed on the beds, the glasses may incline more or less towards the south sun, especially for all early hot-bed work, in winter and spring; though in some places limited to situation, or for the sake of a place of greater shelter, we are sometimes obliged to have the Melon-Ground in exposures varying several points from the above, such as south-west and south-easterly aspects; but are not so eligible for early hot-beds as a full or more southerly exposure; however, hot-beds in these aspects, where well defended with some eligible fence or plantation from the northerly and other cutting winds, and enjoying a great portion of the principal sun, often suit most occasions, especially in spring work, from February, March, or April, till June, &c. or as long as hot-beds are required in the season; but I nevertheless would advise in general to have the place inclining to a south or south-easterly aspect as much as possible.

In regard to dimensions and form of a Melon-Ground, they may be according to the following observations.

As to dimensions or extent, no particular bounds can be assigned; it must be according to the quantity of hot-bed framing intended or required, two or three, to ten, twenty, or thirty frames, or more; and sometimes also hot-bed ridges for hand-glasses, less or more, in the same proportion; so that, agreeable to these intimations, a Melon-Ground may be from two or three to five or ten rods square, or to that of a quarter, or half an acre, or more; especially in considerable gardens, where, generally, besides the part immediately allotted for the hot-beds, it would be practically convenient to have room also for the previous preparation of the dung, &c. ready both for making the hot-beds, and for occasional lining them to revive the declining heat; likewise it would be of advantage to have room, either wholly or in part, for compost heaps of earth, &c. in preparation for earthing

earthing the said hot-beds; and having commodious room is also convenient in various other requisites to hot-bed culture.

And with respect to the proper form, if a particular portion of ground is assigned for this purpose, the most eligible shape is a square, either an equal or oblong square, not very material which, if conveniently suitable to the allotted situation, and consistent with the requisite aspects before mentioned:

Having before intimated that the assigned place for this compartment should be in some best sheltered part of the kitchen-ground, where well defended from the northerly winds and cutting blasts by the walls or other fences of the garden, or sometimes also by plantations at some eligible moderate distance to break off strong and cold piercing winds; which circumstances of a sheltered situation, as above, should be attended to as well as possible, as being very material in the culture of early hot beds; or where the destined place is not eligibly sheltered by the above means, and if unavoidably in a rather too much exposed situation, it would be of particular advantage, where convenient, to have the whole separately inclosed with some close fence, either a reed-hedge or paling, &c. serving both to break off cutting blasts; and, if thought proper to have a door or gate to lock occasionally, it may be convenient at particular times, as a greater security to the hot-bed productions: the fences may be six, seven, or eight feet high in the northerly or back part, five or six in front, the sides corresponding, though in extensive inclosed Melon-Grounds the fences may be nearly of equal height all round.

Then with respect to the internal part;—the immediate place for the hot-beds, if naturally dry or a little elevated to throw off falling wet of heavy rain, &c. will be a particular advantage, as before observed; but if unavoidably low, or liable to be very wet in winter or spring, &c. it would be advisable to raise that part moderately with some dry materials, a little above the general level, both that the hot-beds may stand dry, and to afford the same advantage in performing the general hot-bed business.

And as to other internal preparation; the ground for the immediate place of the hot-bed may generally remain even or level: though some form a shallow trench the width and length of the intended hot-beds, six to twelve inches deep, and make the lower part of the bed in the trench; which, however, is more eligible in a dry or somewhat elevated situation, than in low or wet ground, as water is apt to settle in the bottom, and chill the bed, and occasion the heat to decay suddenly; on which

consideration, I would rather advise to have the whole ground level, or without sinking any trench in which to make the hot-beds, or rather have the part a little higher to shoot off the wet from the beds as much as possible; and by having the hot-bed wholly above-ground, we have the advantage of applying the occasional linings quite from the bottom upwards.

Or, however, where the ground is tolerably dry, a shallow trench, not more than six inches to a foot deep, may be adopted, if thought more convenient, just to form the place ready, of the proper general width and length of the intended or occasional hot-bed, as an immediate direction for laying the bottom dimensions as it were, conformable to the formation of the general bed; previous to which, if thought proper, may have some rough dry materials spread evenly along the bottom of the trench; in order to keep the bottom of the bed more effectually dry.

Though it may be observed in the course of this work, that, in some particular cases of hot-bed culture, such as the late hand-glass crops of cucumbers, occasional directions are given, advising the hot-beds to be made in trenches, twelve to fifteen or eighteen inches deep; but of which it should also be remarked, they are on a different consideration: first, these hot-beds are not made till late in the season, i. e. middle or latter end of April, and in May, when the ground is dry and warm; and by the advanced season, the beds not generally requiring lining, as being made almost wholly in a trench, and the upper part closely earthed over, thereby excluding the external air, and confining the whole heat below, are continued in a proper temperature for this occasion; which would be very different in an early season when the ground is cold and wet; and again, these late hot-beds are sometimes advised, in the afore-mentioned advanced seasons, to be made in trenches as above, in any open quarter of good ground in the kitchen-garden, which is principally recommended for the sake of having the excavated rich earth of the said trenches immediately ready, wherewith to earth the beds, especially where of some considerable extent or quantity.

Therefore, in Melon-Grounds allotted for hot-beds in early seasons in winter and spring, it would be most advisable to have the ground either remain in a level or full surface whereon to make the hot-beds, or only make a very shallow trench just to form the dimensions in width and length of the beds, as above intimated, both for the advantage of having the beds stand as dry as possible in those early cold seasons, and to have the opportunity of applying

ing the occasional linings more effectually to the whole in the order before mentioned.

MENISPERMUM, Moonseed.

It furnishes some hardy climbers of America, for the shrubbery, rising with climbing, ligneous, durable stalks, twining round any support twelve or fifteen feet high, garnished with roundish peltate leaves, and bunches of polypetalous dioecious flowers.

Class and order, *Diœcia Dodecandria*.

Characters.] **CALYX**, male and female flowers on separate plants, having a perianthium of two short narrow leaves. **COROLLA**, four exterior oval petals, and eight oval concave interior ones. **STAMINA**, twelve or more filaments in the males, and short quadrilobed antheræ. **PISTILLUM**, two small, oval, incurved germina, in the females with solitary recurved styles, and bifid stigmas. **PERICARPIUM**, two roundish-reniform, unilocular berries, each having one large reniform seed.

The chief species are,

1. **MENISPERMUM canadense**.

Canada Round-leaved Moonseed.] Rises with several climbing ligneous stalks, twining upon support twelve or fifteen feet high; large, peltate, cordate, roundish, angular leaves, on long twining foot-stalks; and from the axillas loose bunches of greenish flowers.

2. **MENISPERMUM virginicum**.

Virginian Lobated-leaved Moonseed.] Rises with climbing ligneous stalks, twining round support twelve or fifteen feet high; large peltate, cordate, lobated leaves; and loose bunches of greenish flowers.

Both these climbers flower here in July; each separate flower is of about twelve oval petals, four exterior, and eight interior ones; and are succeeded by ripe feeds in autumn.

These plants are employed as climbers in the shrubbery to form a variety, placed to twine round the stems of trees, or any other support; or their numerous stalks and branches will twine and interweave one among another, and assume a bushy growth: it is, however, proper to allow them some support; for in America, their native soil, they climb up trees to a considerable height; so that here they are proper furniture for the shrubbery quarters to climb among trees and bushes.

Their propagation is either by layers in autumn, which will be well rooted in one year; or, as they spread exceedingly in root, sending up many shoots, these being separated in autumn, each with roots to it, will form proper plants.

They may also be raised from seeds sown in spring in the open ground, half an inch deep;

they will rise the same year, managing them as other hardy seedlings.

MENTHA, Mint, Penny-Royal, &c.

The plants are hardy, herbaceous, aromatic perennials for the kitchen-garden, of admirable salutiferous properties, both for culinary purposes and medicine; have all creeping perennial roots, sending up stalks annually; some erect and two or three feet high, others trailing and scarce a foot long; all the sorts are garnished with simple oblong and oval leaves, and terminated by verticillate spikes, and clusters of numerous small, monopetalous, tubulous flowers.

Class and order, *Didynamia Gymnospermia*.

Characters.] **CALYX** is monophyllous, tubular, erect, five-parted, and permanent. **COROLLA** is monopetalous, tubular, erect, and divided into four parts, the upper largest and emarginated. **STAMINA**, four didynamious filaments, and roundish antheræ. **PISTILLUM**, a quadrifid germen, slender style, and spreading bifid stigma. **PERICARPIUM**, none; four seeds lodged in the calyx.

To this genus is joined the *Pulegium*, or Penny-Royal.

There are many species of *Mentha*, most of which grow wild in this country by the sides of brooks, rivers, and watery ditches; but of which there are seldom more than three species cultivated, viz.—common green Spear-Mint—Pepper-Mint—and *Pulegium*, or Penny-Royal.

The most material species are,

1. **MENTHA viridis**.

Green Long-leaved, or common Spear-Mint.]

Hath long, creeping, very spreading roots; upright, square, single, green stalks, rising two or three feet high; garnished with spear-shaped, serrated, close-fitting, smooth, very green leaves; and the stalks terminated by purplish flowers, in oblong erect spikes; the stamina longer than the corolla.

Varieties.] Broad-leaved—narrow-leaved—curled-leaved—variegated-leaved—silver-striped-leaved—gold-striped leaved.

This is the species of *Mentha* the most commonly esteemed and cultivated in kitchen-gardens for all culinary uses, as for sauces, salads, &c. also to dry for winter; and for several medical purposes; and the curled-leaved and variegated sorts of it are employed in the pleasure-garden for variety. It grows wild in England, but has been long cultivated in gardens, and is superior in quality to the two immediately succeeding species, which are also of the Spear-Mint kind.

The appellation Spear-Mint is derived from the spear-like form of the spikes of flowers.

2. *MENTHA sylvestris*.

Wild hoary-leaved Spear-Mint.] Hath long, thick, spreading roots; upright, square stalks, two feet and a half high; oblong, serrated, hoary, close-fitting leaves; and the stalks terminated by pale-red flowers in oblong erect spikes, the stamina longer than the corolla.

3. *MENTHA rotundifolia*.

Round-leaved Spear-Mint.] Hath long spreading roots; upright stalks, two feet high; large, roundish-ovate, rough, crenated, close-fitting leaves; and the stalk terminated by flowers in oblong erect spikes.

These last two species, *Mentha sylvestris* and *rotundifolia*, grow wild in this country in moist places, are often distinguished by the names of Horse-Mint, and are sometimes cultivated, though they are supposed inferior to the first species, *Mentha viridis*, which is very distinguishable from both these species, as also from the following:

4. *MENTHA piperita*.

Pepper-Mint.] Hath long, thick, creeping roots; upright, branchy, purple stalks, two feet and a half high; garnished with oval-oblong, serrated, dark-green leaves, having foot-stalks; and the stalks and branches terminated by purple flowers in roundish heads; the stamina shorter than the corolla.

This species is of a fragrant, warm, penetrating flavour; is in universal estimation as a medicinal herb, greatly used for distilling, and of which is prepared that fine salutary cordial, called Pepper-Mint Water.

5. *MENTHA gentilis*.

Slender Red-stalked, or Basil-scented Mint.] Stalks slender, reddish, leaves ovate, acute-fawed; flowers in whorls, with stamina shorter than the corolla.

Variety.] Orange Mint.

6. *MENTHA crispa*.

Curled-leaved Mint.] The leaves hearted, indented, waved-curled, sessile; and flowers growing in heads, having the stamina equaling the corolla.

The following varieties of *Mentha* are of different species, and cultivated principally for variety—Orange Mint, having roundish leaves, smelling like orange-peel—gold-striped orange Mint—yellowish orange Mint—reddish orange Mint—hoary white Mint—silvery spotted Mint—hoary variegated white and green Mint—variegated white and green, tinged with red. Most of these varieties are strongly scented, some like an orange, others resembling balm, and some like penny-royal.

Penny-Royal Kinds.

7. *MENTHA Pulegium*.

Pulegium, or Penny-Royal.] Hath small,

fibry, very spreading roots; small, trailing, roundish, rooting stalks, spreading every way, taking root as they advance; garnished with small, oval, obtuse, slightly crenated leaves; and the stalks terminated by verticilli of purple flowers, having the stamina longer than the corolla.

This species is a fine aromatic; it grows wild upon commons, &c. in many parts of Britain, and is cultivated in kitchen-gardens as a culinary herb.

8. *MENTHA cervina*.

Stag, or Upright Penny-Royal.] Rises with erect stalks, branching on every side, a foot and a half high; garnished with linear or very narrow thickish leaves; and terminated by verticilli of purple flowers.

All these six species of *Mentha*, and respective varieties, are perennial in root, but the stalks rise in spring and decay in autumn.

They flower in June and July: the flowers are mostly very small, each of one tubular petal of no beauty, and are succeeded by ripe seeds in autumn; but the seeds are rarely used, the plants being all generally propagated either by parting the roots, by young off-set plants, or by cuttings.

The plants are all exceedingly hardy, and prosper in any common soil of a garden, and, once planted, continue of many years' duration by the roots.

They are all of a warm, fragrant, aromatic, and cordial nature, and their virtues reside in their stalks and leaves; and most of the Mint kinds possess excellent medical properties.

With respect to their particular merit as garden plants; the common green Spear-Mint is valuable both as a culinary and medical herb; but the Pepper-Mint principally for medical uses, and for which it is greatly esteemed, and is generally distilled: and the Penny-Royals are proper both for kitchen uses and medicine. Observing, that for all of which purposes they merit culture in every kitchen-garden, where they should be disposed either in four-feet-wide beds, having foot-and-a-half alleys between, the plants placed in rows lengthways in the beds, six or seven rows in each, or planted in borders in rows the same distance.

But as they are employed both principally in the kitchen-garden, as sweet, salutary, aromatic herbs, and some sorts to introduce occasionally in the pleasure-ground for variety more than ornament, it may be proper to observe, that for general domestic purposes, the *Mentha viridis*, or green Spear-Mint, is of the most estimation to use commonly as a kitchen

kitchen or culinary plant of the Mint kind, as being rather of a more mild agreeably-aromatic flavour than the others; though the other Spear-Mint kinds are also used occasionally, or rather, however, more eligibly, for distilling, or to dry for keeping, than to use green in the kitchen; but the Pepper-Mint being of a peculiar warm flavour and quality, is proper only for distilling; and of the Penny-Royal kinds the *Pulegium* is the principal sort to use domestically; likewise observing, that when required to admit any of the species of *Mentha* in collections of plants for variety or observation, they may be dispersed in any of the common borders, &c. in small bunches, each sort separately in a varied order, in assemblage with other hardy herbaceous perennials, in which they will effect an agreeable diversity in summer.

On the above different occasions all the sorts may be planted in spring, summer, or autumn, either by slips or parting the roots in spring or autumn, or by young off-set plants rising thickly in any old beds in the spring months, and by cuttings of the green stalks in the early part of summer: and by all of which, those of the spring and summer planting will acquire full growth the same year in summer, and which, in the economical kinds, will attain perfection for gathering young, and in advanced mature growth, for general use, in plentiful supplies from May or June till September or October, &c.

Mint for kitchen uses is proper to gather in spring and summer, &c. when from about one, two, or three to six inches or a foot or more high; or when of advanced growth, may generally crop the young tops more or less, as required on different occasions for immediate use; they will break out below in successional young productions; at the same time may keep some cut down close, to furnish a supply of young bottom shoots; but likewise permit a principal portion to advance in full growth, or nearly beginning to flower in June and July, being then in best perfection to cut either for distilling, or to dry and house for winter service; and for which latter purpose should always gather a plentiful supply annually of the Spear-Mint kinds rather before they come into flower.

For kitchen uses, the common green Mint and Penny-Royal are the most proper whilst young and tender, as in spring and beginning of summer; but by cutting down some of their stalks occasionally in summer and autumn, especially the Mint, a succession of young shoots may be continued rising from the bottom all spring and summer, until October or November;

and by the aid of hot-beds, young Mint may be obtained all winter until the common crop comes up in spring, as directed in their propagation.

But when any of the sorts of *Mentha* are required for drying to keep, or are wanted for distilling or other medical uses, they should be permitted to grow a foot high at least, before gathering them, or advance to nearly their full height, or till just beginning to form for flowering; not longer; for in that state, and while the stalks and leaves are in full succulent growth, they are generally then in the greatest perfection for those purposes.

When any of these plants are intended to be dried for keeping for winter use, cut them in dry weather, and spread them in a dry airy place to dry, but not in the sun, which would dry them too fast, and exhaust their goodness; therefore mark this, and spread them, or hang them up in bunches, where they may be out of the wet and sun, and dry gradually, then bunched up and housed for the winter.

Propagation of the Mint Kinds.

Previous to the work of propagation, we will in the first place just hint, that for the reception of all the sorts for use, prepare, in the kitchen-garden, either some convenient border, or four-feet-wide beds, having foot-and-half alleys between, for the convenience of going in to clean, water, and cut the crops, as also for earthing the beds a little in autumn, by way of dressing, both for neatness and to encourage the plants.

But to the propagation: all the sorts of Mint are propagated either by parting the roots, by young off-set plants, or by cuttings.

By parting the Roots.—In autumn or early in spring, before the young shoots begin to appear, dig up from any old plantation a quantity of roots, and divide them into smaller parts, and of which chuse the strongest and freshest for planting: then proceed to plant them in drills, which draw with an hoe lengthways the bed, or if borders, cross-ways, an inch and a half deep, and half a foot asunder; and along the bottom of each drill place the roots of the Mint thinly, covering them over with the earth, to the depth of the drills; then lightly rake the surface smooth, and the work is done.

They will readily grow, and afford plenty of young Mint the ensuing spring and summer, for sallads and culinary uses; also, if suffered to run up, will afford one or two good cuttings at full growth for drying, or for distilling.

By Young Plants.—In beds of Mint of a year or more standing, young shoots rise numerous-ly.

ly in spring, so as to admit of thinning; and a quantity of the most robust of which, drawn out with fibres at their bottom, form fine sets or plants for making a new plantation; therefore in March, April, or May, when the shoots are advanced three or four to five or six inches long, take the opportunity of showery weather, and proceed to take up a quantity of the strongest, having a knife to assist in raising and separating them from the old roots; they will readily rise with roots to each; then proceed with line and dibble to plant them in rows, six inches apart, and four inches asunder in the rows, inserting each plant half way into the ground, and finish with a good watering, repeating it occasionally; and they will very soon take root, spread at bottom, and afford a full crop the same year.

By Cuttings.—In May or June, in moist weather, cut off a quantity of the strongest shoots or stalks near the bottom, and divide them into cuttings six inches long: plant them by dibble in rows, six inches asunder, in beds as above, give water directly, and repeat it in dry weather; they will soon take root, spread at bottom, and produce a full crop the same summer.

The above three methods of propagation hold good with all the sorts of Mint.

Observe, however, those designed to form variety in the pleasure-garden should be disposed in patches in different parts.

A plantation of Mint for use will afford several cuttings every summer, when it is only required young for present use, for culinary purposes; but when required for drying to keep till winter, or wanted green for distilling or any medical use, they should generally be suffered to stand until June or July, till nearly full grown, and just coming into flower; which being then cut down close, the roots will send up another crop fit to cut again in August or September, or towards Michaelmas: each general cutting, whether to be cut young, or when at full growth, should always be cut as close to the ground as possible.

The general culture of all the sorts is clearing them from weeds in spring and summer, cutting down all remaining stalks every autumn; clearing off also any autumnal weeds; and in October or November dig the alleys, and spread a little of the earth over the beds; this will give an air of culture and neatness, and prove beneficial to the crop.

A plantation of Mint, &c. will be of many years' duration: but to have a constant succession of good full crops, a fresh plantation should be made every four or five years.

Forcing Mint for Winter Use.

Young green Mint is often required in winter for fallads, sauces, &c. but this can only be obtained by aid of hot-beds; and the common green Mint is the properest sort; therefore, any time in winter from November until the beginning of February, a hot-bed may be made for this purpose. Make it but moderate; about two feet thick of dung will be sufficient, and covered with garden-frames and glasses, or, in default thereof, may be arched over and covered with mats; as soon as it is made and framed, earth it over with rich mould, six inches thick; then take up a quantity of the green or Spear-Mint roots from a bed, &c. in the natural ground, and spread them close together upon the surface of the earth of the hot-bed, and mould them over closely an inch deep with fine earth, and put on the lights; or if mat-coverings are used, cover only on nights, and bad weather; but frames and glasses are the most eligible for the middle of winter; observing to open the lights to let off the steam, and to admit fresh air: the plants will soon come up plentifully, when continue to admit fresh air in fine weather, and give moderate waterings, and they will soon be ready for use in young green tops, fit to gather.

When the plants thus raised are an inch or two high, or a little less or more, they may be cropped for use; they will readily break out again, and fresh shoots rise from the bottom; so that the same bed will furnish a supply of plants a long time; and two beds, made at different times, may be sufficient for the whole winter.

By the above practice of forcing Mint, you may obtain it young and green from the time the natural ground Mint goes off in autumn, until it comes in again in spring.

Or some roots planted thick in large pots and placed in a hot-house, &c. will quickly shoot and furnish plants of young green Mint for fallads, sauces, &c. as above.

When it is, however, intended to force Mint every winter, a small fresh plantation should be made annually in the open ground for that purpose, to furnish a sufficiency of roots fit to take up at forcing time, without disturbing those of the principal crop.

Propagation, &c. of the Penny-Royal Kinds.

Both the Penny-Royal species delight in a moist soil; they, however, will both prosper in any good earth of the kitchen-garden.

They are propagated in great plenty either by slipping their roots, in autumn or spring, or by slips or cuttings of their rooting-stalks, which spreading upon the ground emit roots from every part; and shoots of them may be taken

taken off plentifully in spring, each well furnished with roots; the slips or cuttings, in either way, are to be planted by dibble, in rows a foot asunder; they will quickly set to growing, and spread about each way, and furnish a full crop for use in spring and summer.

Their culture is nearly the same as the Mint, and a plantation will be of several years' duration.

For the Green-house.

9. *MENTHA canariensis.*

Canary Shrubby Mint.] Stem under-shrubby, leaves oval, crenated, opposite, and flowers in forking spikes at the axillas. This must be kept in pots, to have shelter of a green-house or frame in winter; and is propagated by cuttings in summer.

MESEMBRYANTHEMUM, (*Ficoides*).
Fig-Marigold.

This genus comprises a numerous tribe of succulent, curious, floriferous exotics, of Africa, for the green-house collection, &c. consisting of one or two annuals, and many perennials; all of them with very succulent stalks and branches, some trailing and herbaceous, others erect and shrubby; and some acaulous; garnished with thick succulent leaves, of various singular forms in different species; and monopetalous multipartite flowers.

Class and order, Icosandria Pentagynia.

Characters.] **CALYX** is monophyllous, acutely five-parted and permanent. **COROLLA** is monopetalous, and deeply divided into many narrow spear-shaped segments in several series. **STAMINA**, twenty or more filaments, and capillary antheræ. **PISTILLUM**, an obtuse five-cornered germen under the corolla; and mostly five, but sometimes ten or more styles, with simple stigmas. **PERICARPIUM**, a roundish fleshy capsule, having as many cells as there are styles, with numerous roundish seeds.

There are numerous different species, all African plants, many from the Cape of Good Hope; above forty of which are retained in our gardens for variety, four or five of which are annual; all the rest are perennial for the green-house collection; and all the sorts are of the succulent tribe, both in stalk and leaves, some with trailing stems, some with shrubby firm stems, others loose and pendulous, and some acaulous; and their leaves being mostly thick and fleshy, are of many different shapes, &c. in different species; some long and round like a cylinder, others three-square, some taper, some tongue-shaped, scymitar-shaped, &c. some opposite and connate, or connected at the base, and some distinct; many are papulose, or pimplly, others punctated, or dotted; some impunctated, or entirely spotless, or smooth, &c. as follow.

Tender Annual Sorts.

1. **MESEMBRYANTHEMUM crystallinum.**

Crystalline Mesembryanthemum, commonly called Diamond Ficoides, or Ice-Plant.] Rises with a short, thick, succulent stalk, dividing low into many trailing, very spreading, succulent branches, bespangled all over with ice-like pimples, very pellucid and glittering; oval, undulate, alternate, papulose or pimplly, glittering leaves; and from the sides of the branches numerous, almost close-fitting, white flowers, tinged with red or crimson; succeeded by plenty of seed in autumn.

This singular and curious plant being closely covered with large pellucid pimples, full of moisture, shining brilliantly like diamonds or bubbles of ice, thence derives its name: it is much esteemed by the curious for its singularity, and highly merits a place amongst the tender annuals of the pleasure-garden.

2. **MESEMBRYANTHEMUM pinnatifidum.**

Fagged-leaved Mesembryanthemum.] Rises with a red succulent stalk, garnished with pinnatifid leaves, rounded at their edges; the flowers arise on pedicles from the sides of the branches, consisting of numerous linear yellow petals and antheræ. The whole plant is sprinkled over with glittering particles like the above, to which it bears some affinity in its duration, and requires the same cultivation.

See Propagation and Culture.

Perennial Sorts, all for the Green-House.

3. **MESEMBRYANTHEMUM geniculiferum.**

Jointed, or Axillary-flowered Mesembryanthemum.] Hath a shrubby succulent stalk; half-cylindric, papulose or pimplly, distinct leaves; and white flowers, sitting close to the axillas, having quadrid cups.

4. **MESEMBRYANTHEMUM noctiflorum.**

Night-flowering Mesembryanthemum.] Hath a thick, shrubby, succulent stalk; half-cylindric, smooth, distinct leaves; and purple and white flowers on foot-stalks, having quadrid cups; the flowers opening on nights.

5. **MESEMBRYANTHEMUM splendens.**

Bright Shining Mesembryanthemum.] Hath a shrubby, firm, succulent stalk and branches, semi-cylindric, recurved, unspotted, smooth leaves, growing distinct in clusters; and whitish flowers, having the cups terminating in digitate points.

6. **MESEMBRYANTHEMUM umbellatum.**

Umbellated Mesembryanthemum.] Hath a shrubby, firm, succulent stalk; awl-shaped, rough-spotted leaves, connate at the base, but spreading at top; and white flowers in a corymbus resembling an umbel.

7. **MESEMBRYANTHEMUM calamiforme.**

Calamiform,

Calamiform, or Quill-leaved Mesembryanthemum.] Is acaulous, or without stalk; almost cylindric-tapered, impunctated or spotless, ascending leaves, connate at the base; and octagynous, or eight-styled, white flowers.

8. MESEMBRYANTHEMUM *bellidiflorum*.

Daisy-flowered Mesembryanthemum.] Is acaulous, or without stalk; narrow, three-cornered, spotless leaves, having the top indented into three parts; and small purplish flowers.

9. MESEMBRYANTHEMUM *deltoides*.

Deltoid-leaved Mesembryanthemum.] Hath a loose succulent stalk; deltoid-triangular, short, thick, indented, spotless, distinct leaves; and pale-purple, fragrant flowers, singly.

10. MESEMBRYANTHEMUM *barbatum*.

Bearded Star-pointed Mesembryanthemum.] Hath a shrubby, firm, succulent stalk and branches; sub-oval, papulose, or pimply leaves, distinct, bearded at the point in a radius; and purple flowers.

11. MESEMBRYANTHEMUM *hispidum*.

Bristly Mesembryanthemum.] Hath a shrubby, firm, succulent, hispid, downy stalk; cylindrical, papulose, distinct leaves; and pale-purple flowers.

Varieties.] With violet-coloured flowers—with orange-coloured flowers—red flowers.

12. MESEMBRYANTHEMUM *villosum*.

Hairy Mesembryanthemum.] Hath a shrubby, firm, succulent, hairy stalk; narrow, semi-cylindric, channeled, downy, spotless leaves, connate at the base.

13. MESEMBRYANTHEMUM *scabrum*.

Rough-leaved Mesembryanthemum.] Hath a shrubby, succulent stalk; awl-shaped, distinct leaves, having all the under-side very rough and prickly; and violet-coloured flowers, with chaffy cups.

14. MESEMBRYANTHEMUM *emarginatum*.

Emarginated, or Notched-flowered Mesembryanthemum.] Hath a shrubby, succulent stalk; awl-shaped, roughish leaves, in clusters; and purple flowers, having the petals emarginated, and with spinous cups.

15. MESEMBRYANTHEMUM *uncinatum*.

Uncinated Mesembryanthemum, or Buck's-horn Ficoides.] Hath a shrubby, jointed, succulent stalk; having the joints terminated by triangular, acute-pointed, connate leaves, indented underneath; and purple flowers.

16. MESEMBRYANTHEMUM *spinosum*.

Spinous, or Thorny-stalked Mesembryanthemum.] Hath a shrubby, succulent stalk and branches, armed with branching spines; taper, three-square, punctated, distinct leaves; and reddish-purple flowers.

17. MESEMBRYANTHEMUM *tuberosum*.

Tuberous-rooted Mesembryanthemum.] Hath a headed, tuberous root; shrubby, firm, succulent stalks; awl-shaped, blistered or pimply, distinct leaves, patulous or spreading at top; and purple flowers.

18. MESEMBRYANTHEMUM *stipulaceum*.

Stipulaceous, or Bordered-leaved Mesembryanthemum.] Hath a shrubby, firm, succulent stem; sub-triquetrous, compressed, punctated, distinct leaves, in clusters, having the base bordered; and purple flowers, nearly in a corymbus.

19. MESEMBRYANTHEMUM *crassifolium*.

Crassifoliated, or Thick-leaved Mesembryanthemum.] Hath a nearly cylindrical, loose, creeping stem; semi-cylindrical, thick, smooth, connate leaves, triquetrous at the top; and purple flowers.

20. MESEMBRYANTHEMUM *falcatum*.

Falcated, or Crooked-leaved Mesembryanthemum.] Hath a shrubby, firm, succulent stem; sub-scymitar-shaped, incurved, punctated, distinct leaves; and purple flowers.

21. MESEMBRYANTHEMUM *glomeratum*.

Glomerated, or Crowded-spiked Mesembryanthemum.] Hath a shrubby, succulent, diffuse, paniculated stalk; cylindrical trigonous, compressed, incurved, punctated leaves; and numerous purple flowers in conglomerated panicles.

22. MESEMBRYANTHEMUM *lorcum*.

Loreated, or Leathery-stalked Mesembryanthemum.] Hath a loose, pendulous, succulent stalk; semi-cylindrical, long, recurved, connate leaves, in clusters, having the interior part of the base gibbous; and reddish purple flowers.

23. MESEMBRYANTHEMUM *filamentosum*.

Filamentous-flowered Mesembryanthemum.] Hath a pendulous, loose, succulent stem, dividing into hexagonal branches; triquetrous, slightly-punctated leaves, almost connate at their base, with rough angles; and small-petaled, obsolete-purple flowers.

24. MESEMBRYANTHEMUM *acinaciforme*.

Scymitar-leaved Mesembryanthemum.] Hath a loose, procumbent stalk; scymitar-shaped, spotless, connate leaves, having angular rough keels; and purple flowers, with spear-shaped petals.

25. MESEMBRYANTHEMUM *micans*.

Glittering-leaved Mesembryanthemum.] Hath a shrubby, firm, succulent, rough stem, sub-cylindrical, pimply, silvery, glittering, distinct leaves; and orange-coloured flowers.

26. MESEMBRYANTHEMUM *rostratum*.

Rostrated, or Heron's-bill Mesembryanthemum.] Is acaulous, or without stalks; semi-cylindric, connate leaves, having the out-side

out-side set with tubercles; and yellow flowers.

27. MESEMBRYANTHEMUM *corniculatum*.
Corniculated, or Horned-leaved Mesembryanthemum.] Hath a loose, creeping, succulent stalk; triquetrous-semi-cylindric, horned, rough, punctated, connate leaves; and yellow and orange-coloured flowers, with ten styles.

28. MESEMBRYANTHEMUM *bicolor*.
Two-coloured Mesembryanthemum.] Hath a shrubby, firm, succulent stem; awl-shaped, smooth, punctated, distinct leaves; and two-coloured flowers, i. e. purple without and orange within.

29. MESEMBRYANTHEMUM *glaucum*.
Glaucous, or Grey-leaved Mesembryanthemum.] Hath an erect, shrubby, succulent stem; three-square, acute, punctated, distinct leaves; and yellow flowers, having the calycinal foli-oles oval-cordate shaped.

30. MESEMBRYANTHEMUM *ringens*.
Ringent-flowered Mesembryanthemum, or Dog's chap Ficoides.] Is sub-acaulous, or almost without stalk; thick, three-cornered, ciliate, indented, dotted leaves; and yellow flowers.

Variety.] Cat's-chap *Mesembryanthemum*.

31. MESEMBRYANTHEMUM *difforme*.
Different-formed leaved Mesembryanthemum.] Having thick, dotted, connate leaves of two or more different forms; and yellow flowers.

32. MESEMBRYANTHEMUM *dolabriforme*.
Axe-leaved Mesembryanthemum.] Hath low, procumbent, succulent stalks; axe-shaped, punctated leaves; and yellow flowers, opening on nights.

33. MESEMBRYANTHEMUM *expansum*.
Expanded-leaved Mesembryanthemum.] Hath low, loose, procumbent, succulent stalks; spear-shaped, plane, expanded, impunctated, or unspotted, distinct leaves, opposite and alternate, at a distance; and yellow flowers, white within.

34. MESEMBRYANTHEMUM *linguiforme*.
Tongue-leaved Mesembryanthemum.] Is acaulous, or without stalk; tongue-shaped, tall, impunctated, smooth leaves, having very thick margins; and large yellow flowers, with ten styles.

Varieties.] With broad leaves—with narrow leaves—long-leaved.

35. MESEMBRYANTHEMUM *vericulatum*.
Veruculiform, or Spit-leaved Mesembryanthemum.] Hath a shrubby, firm, succulent stalk, three-square-cylindric, bowed, acute, unspotted, pellucid, distinct leaves, connate at the base; and yellow flowers in clusters.

36. MESEMBRYANTHEMUM *tortuosum*.
Tortuose Olive-leaved Mesembryanthemum.] Hath a low, loose, procumbent, succulent stalk; plane, oblong-oval, sub-papillose, connate leaves, in clusters; white flowers with saffron middles, having triphyllous two-horned cups.

37. MESEMBRYANTHEMUM *albidum*.
White-leaved Mesembryanthemum.] Is acaulous, having three-square, thick, firm, entire leaves, of a whitish colour; and large golden-yellow flowers.

38. MESEMBRYANTHEMUM *pugioniforme*.
Dagger leaved Mesembryanthemum.] Hath a shrubby, succulent stalk; awl-shaped, triquetrous, very long, spotless, alternate leaves; and large, golden-yellow flowers, with ten styles.

39. MESEMBRYANTHEMUM *serratum*.
Serrated-leaved Ficoides.] With awl-shaped three-sided punctured leaves, having the keel-angle contrary sawed.

40. MESEMBRYANTHEMUM *forficatum*.
Forked Mesembryanthemum.] Having a two-edged succulent stalk; scymitar-shaped, obtuse, unspotted, connate leaves, thorny at the point.

41. MESEMBRYANTHEMUM *Tripolium*.
(Tripolium)—or Sea Star-wort Ficoides.] Having a loose single stalk, spear-shaped, plane, unspotted leaves; placed alternate.

42. MESEMBRYANTHEMUM *caule*.
Eatable fruited Ficoides.] Having a two-edged stalk, equally-triangular, acute upright leaves, with the keel sawed.

43. MESEMBRYANTHEMUM *tenaisolium*.
Small-slender-leaved Ficoides.] With half-cylindric, awl-shaped, long, slender, smooth leaves.

Annual Kinds of less note.

44. MESEMBRYANTHEMUM *copticum*.
Coptic Egyptian Ficoides.] With leaves half-cylindric, pimply, distinct; flowers axillary, sessile.

45. MESEMBRYANTHEMUM *pomeridianum*.
Afternoon-flowering Ficoides.] With planith, broad-spear-shaped, smooth, distinct leaves, somewhat ciliated.

46. MESEMBRYANTHEMUM *nodiflorum*.
Knot-flowering Ficoides.] With leaves somewhat cylindric, obtuse, ciliated at the base.

All these species of *Mesembryanthemum* being originally natives of Africa, they, in this country, require the culture adapted for other tender exotics of similar temperature; the annual sorts requiring to be raised in hot-beds under glasses till June, and then will live in the open air till the end of summer or autumn, when the cold terminates their existence; and the

perennial sorts must assemble with the green-house exotics to have shelter of that conservatory in winter; all the sorts, both annual and perennial, are of succulent growth, in stalk, branches, and leaves, as before suggested; of which the annuals are but of one summer's duration, and are plants of curious singularity, particularly the first sort, which is the most noted of the annual kinds in our gardens; the second is also curious in its pinnatifid leaves, and numerous glittering particles somewhat similar to the former; and as to the perennial species, they are wholly of some years' durability in root, and mostly durable in stem, branches, and foliage; those described shrubby, rise with firm stems of different heights, often branchy; the others, described pendulous, have loose straggling stems and branches, inclining to the ground; and the acaulous sorts have no stalks at all: their leaves are universally very thick, succulent, fleshy, and of so many various shapes, situations, directions, and many of them curiously punctured or dotted with transparent points; others papillose, or covered with pellucid pimples, as in each respective description; that, together, they exhibit a singularly agreeable variety at all times of the year, and merit a place in every curious green-house collection. They are also very ornamental in their flowers, which in different sorts appear at different seasons of the year, as in spring, summer, autumn, and winter, and many of the sorts so floriferous as to appear covered with their flowers.

The flowers of all the species are universally monopetalous, but each is multifid or finely divided, almost to the bottom, into numerous narrow segments, in several series, all uniting at the base, appearing like some sorts of marigolds, and which in their native soil, Africa, are succeeded by abundance of fruit, shaped somewhat like a fig: hence the name Fig-Marigold (*Ficoides*).

The *Mesembryanthemum crystallinum* and *pinnatifidum* are very tender annuals while young; are raised annually from seed in spring, by aid of hot-beds, until June, when they will endure the open air till October, and then wholly perish; though if in autumn they are placed in a hot-house, they will often live all winter; they are commonly planted in pots, to move to different parts occasionally; but if planted in the full ground, they grow considerably stronger, even to luxuriance; they however, when confined in pots, flower the most abundantly, and ripen plenty of seeds.

All the perennial sorts are of the temperature of green-house plants, so must be kept constantly in pots to move to that conserva-

tory in winter; though some of the shrubby kinds are hardy enough to succeed all winter under a garden-frame, and sometimes in a warm border against a south wall; it is, however, proper to allow the principal part, the winter's shelter of a green-house.

As all the sorts are of a succulent nature, always replete with moisture, they should be potted in a poor, light, dry earth; if sandy, or of a rubbishy nature, the better; however, any common light sandy earth, free from dung, is proper, or a compost of light dry materials. See COMPOST.

They require shelter from October till May or June, must have but little water in winter, but frequent in summer, when in the open air in dry weather.

Propagation and general Culture.

Their propagation is, all the annual sorts by seeds annually in spring in a hot-bed; and all the others by cuttings of their stalks or branches, in summer in the common ground; though their rooting may be facilitated by aid of artificial heat: observe the following directions for each sort.

First, the annual sorts. — They are all raised annually from seed sown in March or beginning of April, in a hot-bed under frame and glasses, as directed for the *Amaranthus tricolor*, *Celosia cristata*, or Cock's-Comb, Globe-Amaranthus, and other tender annuals, as one bed may raise the whole (See ANNUAL PLANTS); observing to mould the hot-bed with very fine light earth, that is perfectly dry, six inches thick; the seed may then be sown either on the surface of the earth, or in very shallow drills, covering it scarcely a quarter of an inch deep, or earthed over as thinly as possible; or may be sown in pots of fine mould, the same depth, plunging the pots in the earth of the hot-bed; the plants will soon rise, but they come up very weak, and advance very slowly at first, as well as being exceedingly tender, and impatient of cold and moisture in their infant growth; indulge them, however, with fresh air daily at all opportunities, as directed in the culture of the above-named annuals; likewise allow them water occasionally, but use great caution in this, and always apply it as moderate and light as possible. When the plants are an inch or two high, prick out some of the strongest, either in the same hot-bed, or in a fresh one, three inches apart, or in small pots singly, giving very light waterings, and shade from the mid-day sun, till fresh-rooted; here to remain a month, or thereabouts, continuing the admission of air, as above, and support the heat of the bed; and then if they are removed with balls into pots,

pots, and placed in a new hot-bed, it will forward them greatly; at which time those intended to remain finally in pots should be planted in proper sized ones (twenty-fours), to remain, which plunge in the hot-bed: let the whole remain in the bed under the frame and glasses, continuing the above management, until the middle or latter end of June, then remove them to the full air; some to remain in the pots, others may be turned out with balls into the open borders, where they will grow freely, and spread their branches abundantly all around upon the ground, two or three feet extent.

As to future culture, those in pots must be frequently watered in dry weather; but those in the borders require no other care than to be kept clean of weeds, suffering their branches to spread about upon the ground.

To save good seed of these species, some of the potted plants should, when in full bloom, be placed either in a frame to have occasional shelter of the glasses in very wet weather and cold nights, whereby they will ripen seeds; or, if placed in a stove, or in a glass-case near the front, where they may have the free air, but defended as above, they will ripen seed more effectually; they, however, in fine dry warm autumns, will sometimes ripen seed without the above precaution; but this is not to be depended on.

Green-house Perennial Sorts.--The propagation of all the stalky perennial species is effected by cuttings of the stalks and branches, any time from April till July; observing those planted before the beginning of June should generally be planted in pots, and plunged in a hot-bed; but those in June or July succeed in the open ground; and the stalkless kinds, or such as are not furnished with branches to afford cuttings, will generally afford some bottom off-sets, or small side heads, to detach in the spring, or summer or autumn.

In chusing the cuttings, observe to cut them off from about two or three to five or six inches long, according to the nature of the plants, and strength of the shoots; observing to divest them of the lower leaves, if any, and then, previous to planting, lay the cuttings in a dry airy room, for some time, to heal over the wound, or cut part, as is necessary to all succulent cuttings; some will require to lie only three or four days, others of the most succulent nature, eight or ten; for the cut part must be healed, otherwise the moisture issuing therefrom would be apt to rot the cuttings after being planted, though some will admit of being planted almost directly.

The cuttings being ready, then having a

compost of light dry soil, either in pots or in the full ground, plant the cuttings therein, from about one inch to two or three deep, according to their length, closing the earth firmly about each, and directly give a little water; then those in pots, if early in the year, may be plunged in a hot-bed, or in the bark-bed; but if in summer, may plunge them in a dry border, or in a garden frame, to have shelter of the glasses from excessive rain, if it should happen before they are rooted effectually, observing to allow all of them occasional shade in sunny days, from about ten until three or four o'clock, till they are rooted, especially those exposed to the sun, by a covering of mats, giving sprinklings of water in dry weather, once or twice a week; remarking that if heavy rains fall, it is proper to shield these kinds of cuttings from it as much as possible; or only when they have struck root, let them enjoy moderate showers.

In six weeks, or a little more or less time, the cuttings will be rooted, and in a growing state, when those that were struck in the full ground must be potted; those already in pots may remain in the same; and all of them, in both cases, placed in a sheltered situation till October, then removed into the green-house, or a good garden-frame furnished with glasses for the winter.

And by bottom side-heads, or off-sets of any of the perennial sorts not affording cuttings, these may be detached at almost any time when they occur of proper growth, spring, summer, or autumn, slipping or detaching them clean to the bottom, as near to the root as may be convenient; and plant them in pots, &c. as above.

As to their general culture of the whole, it is the same as for other succulents of similar temperature; giving them shelter every winter, from October, until May, or beginning of June; and from thence to the end of summer, may place them in the open air: water them sparingly in winter, but freely in summer in dry hot weather; and shift them occasionally into larger pots. See GREEN-HOUSE PLANTS.

MESPILUS, Medlar.

This genus consists of deciduous fruit-trees and flowering shrubs, and a very ornamental ever-green; all hardy, mostly of upright growth, and garnished with spear-shaped, and oblong-oval foliage, and quinquepetalous flowers; in some singly, but in the greater part in bunches, from the sides and ends of the branches; succeeded by globular, baccaceous, eatable fruit, in some sorts as large as moderate apples.

Class and order, *Icosandria Pentagynia*.

Characters.] CALYX is monophyllous, divided into five concave, patent, permanent segments.

segments. COROLLA, five roundish, concave petals, inserted into the calyx. STAMINA, twenty or more filaments inserted into the petals, and simple antheræ. PISTILLUM, a roundish germen below the corolla, five erect styles, and capitated stigmas. PERICARPIUM, a globular, umbilicated bacca, crowned by the connivent calyx, and containing five gibbous, stony seeds.

In this genus old botanists arranged the hawthorn, cockspur-haw, azarole, and some other species, now of the genus *Cratægus*, &c. whose flowers are also icofandrous, but have only two styles; whereas, in all the proper species of *Mespilus*, now under consideration, the flowers have five styles; which is an obvious generic distinction between these two genera.

The real species, therefore, of this genus, are the following eight, seven deciduous, and one ever-green, all of the hardy tree and shrub kind.

Deciduous Kinds.

The first of these (common Medlar) is considered principally as a fruit-tree, also sometimes to cultivate for variety; the others chiefly as flowering shrubs for ornament.

1. *MESPILUS germanica.*

German Mespilus, or Common Medlar.] Rises with a deformed tree-stem, branching irregularly fifteen or twenty feet high; spear-shaped leaves, downy underneath; and large close-fitting, white flowers, singly from the sides of the branches; succeeded by large, roundish, brown fruit, the size of middling apples, ripening in October, but not eatable till beginning to decay.

Varieties.] Common great German Medlar—smaller Nottingham Medlar—pear-shaped Italian Medlar.

This species and varieties are all cultivated in the English gardens for the fruit: but the German or Dutch Medlar, and the Nottingham kind, are the most common; and the latter of which two, though a smaller fruit, is rather preferable for richness and poignancy of flavour. Remarking of all these kinds of fruit, that they are never eatable until they commence a decaying-like state, as it were, becoming buttery soft and tender; for when firm and sound, are of a singularly austere disagreeable taste; yet having lain some time after being gathered, till they begin to assume a state of decay, and become soft as above, they acquire a delicious flavour, extremely agreeable to many, to others altogether unpalatable.

All the sorts attain their mature growth on the trees in the latter end of October, or be-

ginning of November; when being gathered, some should be laid in moist bran, in several layers, to forward their softening, others on straw in the fruitery; those in the bran will begin to be ready for use in about a fortnight, and those laid on straw will come gradually forward in succession.

The following are shrubby, and produce a small berry-like fruit.

2. *MESPILUS arbutifolia.*

Arbutus-leaved Mespilus.] Mespilus with a shrubby stem, branching erectly five or six feet high; lanceolate, crenated, alternate leaves, downy underneath; and from the sides and ends of the branches, small white flowers in clusters, succeeded by small, roundish, purple fruit, like haws.

Varieties.] With red fruit—with black fruit—with white fruit.

3. *MESPILUS Amelanchier.*

(Amelanchier)—or Shrubby Medlar, with black fruit.] Rises with several shrubby, slender, hairy stems, branching moderately about four feet high, having purplish branches; oval, serrated leaves, downy underneath; and small white flowers, in clusters at the ends of the branches; succeeded by small black fruit.

4. *MESPILUS, Chamæ-Mespilus.*

Dwarf Alpine Medlar, commonly called Bastard Quince.] Hath a shrubby, slender, smooth stem, branching weakly four or five feet high, having purplish branches; oval, serrated, smooth leaves, on long foot stalks; and from the axillas, purple flowers, collected into round heads, with narrow, purplish, deciduous bractæ; succeeded by small red fruit.

5. *MESPILUS Cotoneaster.*

Cotoneaster, commonly called Dwarf Quince.] Rises with a shrubby, smooth stem, branching four or five feet high, the branches slender and reddish; oval entire leaves, on short foot-stalks; and from the axillas, small, close-fitting, purple flowers, two or three together, succeeded by small, roundish, bright-red fruit.

6. *MESPILUS canadensis.*

Canada Snowy Mespilus.] Hath a shrubby, smooth stem, branching four or five feet high, having smooth, purplish branches; oval-oblong, serrated, smooth leaves, on long foot-stalks; and all the branches terminated by clusters of snowy-white flowers, succeeded by small, purplish fruit, like haws, containing two or three seeds.

7. *MESPILUS tomentosa.*

Woolly Mespilus.] Hath a shrubby, smooth stem, branching eight or ten feet high, having brown branches; oval, entire, obtuse leaves, downy underneath, and purple flowers in umbels,

bels, growing from the sides of the stalks, succeeded by large, red, pentaspermous fruit.

Ever-green Kind.

8. *MESPILUS Pyracantha.*

Pyracantha, or Ever-green Thorn.] Rises with a shrubby, spinous stem, branching diffusely twelve or fourteen feet high; the branches slender and flexible, with a dark-greenish bark, armed with long sharp spines; spear-shaped-oval, crenated, ever-green leaves; and all the shoots terminated by numerous clusters of whitish flowers; succeeded by large bunches of beautiful red berries, remaining all winter, and exhibiting a very ornamental appearance.

All these eight species of *Mespilus* are of the tree and shrub kind; the first seven sorts are deciduous, the eighth an ever-green, the leaves universally simple; those of the *Mespilus germanica* very large; the others mostly of moderate size; and in most of the sorts growing upon short foot stalks. They all flower abundantly every summer, the flowers universally hermaphrodite, and consist each of five large, roundish petals, twenty stamina, and five styles; and are succeeded by plenty of fruit, which in some is as large as middling apples, as before observed, in the common Medlars; others scarcely the size of haws.

They are all very hardy, and succeed in any common soil and situation, and their propagation and culture is very easy.

With respect to their use in gardens, the first sort and varieties are cultivated as fruit-trees, principally in standards, sometimes also as espaliers for variety; and are also often introduced into the shrubbery plantations to diversify the collection; all the other species are very proper furniture for any ornamental plantation, where they will effect variety very agreeably with their different foliage; and their flowers make a fine appearance, as also their fruit in autumn and winter, which, if not devoured by birds, remain long on the branches, and afford a fine variety in those seasons; observing to dispose the deciduous kinds in assemblage, principally with others of that tribe; and the ever-green sort also chiefly with those of its own nature; arranging each sort according to its gradation of height; but the *Pyracantha* being agreeably ornamental, both as an ever-green, and singularly beautiful in its numerous clusters of fine red berries, covering the branches in winter, it in particular should have a conspicuous situation; this sort, however, being rather of flexible growth, is most commonly trained against walls or the fronts of houses, both for

the support of its flexible branches, and that it may exhibit its berries more ornamentally; it, however, may also be trained as a standard shrub, like the other sorts, in the open shrubbery; in which generally train the whole with short, single stems, and permitted to branch out upward into spreading heads.

When it is designed to have any of the common Medlars as fruit-trees, they may be trained either as dwarfs, for dwarf standards, or for espaliers, or trained as half or full standards, and managed in either of these modes of training nearly as other fruit-trees, particularly the apple and pear; and are raised by seed, by grafting, or by budding: but the two latter methods are the most certain for continuing the sorts without variation; observing, after shortening their first shoots from the graft or bud, where it shall seem necessary, to force out a proper supply of wood to form a head; train the branches afterwards principally at full length, and let the standards branch out in their own way, or only prune casual very irregular growths.

Propagation and Culture.

All the sorts are easily raised from seeds, layers, and by grafting and budding.

By Seed.—By this method all the sorts may be propagated plentifully in the common ground; observing, however, that it is most eligible to raise the *Medlars* principally by grafting or budding, to continue the sorts; but in respect to sowing the seeds, these should generally be sown in autumn, in a bed of common earth; they usually lie a year, or more, before they germinate; that is, like haws and holly-berries, &c. they rarely come up before the second spring; when water them frequently in dry weather; and in autumn or spring following, the largest seedlings may be thinned out and planted in nursery-rows, two feet by one asunder; and in another year plant out all the rest in the same manner; and in three or four years, they will be proper for the garden or shrubbery.

By Layers.—In autumn, or any time from that season until February or March, lay the young branches by the common method: they will be properly rooted by autumn following, when transplant them in nursery-rows like the seedlings.

By Grafting and Budding.—Either of these methods should generally be practised for raising the common Medlars, for they are apt to vary from seed; but all the other sorts may also be readily propagated by the same methods; observing, that the stocks generally used, on which to work most of the sorts, are either any of the larger Medlar kinds, or sometimes

times the *White Thorn*, raised from seed, as above; but the pear-stock is rather to be preferred for the common Medlars, when intended for fruit-trees; and the work of grafting and budding them is in the usual way, low in the stock to form dwarfs; and for half, or full standards, it may also either be performed low in the stock, and train the first shoot for a stem, or let the stock form a stem, and work them at from about three or four to five or six feet height. See GRAFTING and INOCULATION.

Observe that those intended for fruit-trees, whether dwarfs, or half or full standards, they, with respect to training, should, for dwarfs, have the first shoots from the graft or bud headed down short in spring, if it shall seem necessary, in order to force out a proper supply of bottom branches, which train as for other dwarf fruit-trees, either for standard-dwarfs or espaliers; or if for half or full standards, and if worked low in the stock, train the first shoot of each for a stem, then top it at the proper height, to force out laterals to form the head; but if worked high in the stock, the first shoots may either be shortened or suffered to grow, as it shall seem proper, according to the natural disposition of the leading shoot, with respect to its furnishing lateral branches less or more; remarking, after this training, the first year or two, to give the tree its first proper formation, you are to desist from any general shortening of the branches, practising it only occasionally to particular shoots, to procure more wood, if necessary, to fill any vacancy, or to reduce any irregular growth, or to cut off dead parts; but otherwise train the branches principally at full length, and let the standards assume nearly their own natural way of branching. See DWARF-TREES, ESPALIERS, and STANDARD-TREES, &c.

MESUA, Indian Rose Chesnut.

An Indian shrub for the hot-house collection, producing rosaceous flowers, having five heart-shaped petals, numerous monadelphous stamina, and divided styles, succeeded by a capsule furnished with kidney-shaped seeds.

Class and order, *Monadelphia Polyandria*.

One species, viz.

MESUA *ferrea*.

[*Ferrous Indian Mesua*.] With a shrubby stem and branches; and spear-shaped leaves.

This shrubby exotic being of the tender kind, must be kept in pots in the stove, and treated as other similar plants of that department; is propagated by seed, layers, and young cuttings, all forwarded in a hot-bed, or in the "bark-bed."

MICHAUXIA, a genus furnishing an her-

baceous, very ornamental-flowering exotic of tall growth, for the green-house.

Class and order, *Ostandia Monogynia*.

[*Characters*.] CALYX, a monophyllous cup cut into sixteen lanceolated segments. COROLLA, monopetalous, rotate, divided in eight parts, and revolute, with a rising nectarium, with eight valves bearing the stamina. STAMINA, eight permanent, subulate filaments, topped with very long, linear antheræ. PISTILLUM, a top-shaped germen, style columnar, persisting, crowned with an eight-parted, revolute stigma. PERICARPIUM, a top-shaped capsule with eight cells containing many small oblong seeds.

There is but one known species, viz.

MICHAUXIA *campanuloides*.

[*Campanula-like Rough-leaved Michauxia*.]

Rises very full of branches almost from the bottom, growing to the height of five or six feet, garnished with lanceolate, indented leaves, and many large pale-purple flowers on long stems, making a beautiful and singular appearance from June to August.

This plant being a tender green-house biennial, must be raised from seeds annually, which, as it doth not produce any seeds here, must be had from the Levant where it is a native.

MICHELIA, (*Michelia*.)

It furnishes, for our notice, one shrubby exotic of India, producing polypetalous flowers, having many stamina, germina, and stigmas, and the like number of seed-vessels, with many seeds.

Class and order, *Polyandria Polygynia*.

The species is,

MICHELIA *Champaca*.

[*Champaca*—or *Indian Michelia*.] With shrubby stem and branches; and simple leaves placed alternate.

This beautiful plant must be kept in pots and stationed in the stove, where it may be increased by seed, layers, and cuttings.

MIMOSA, Sensitive Plant, &c.

This genus comprises shrubby and herbaceous plants, but mostly of the shrub kind, some trailing, others erect, all natives of the Indies, &c. retained here in stoves as great curiosities, particularly for the very singular sensibility of the leaves of some sorts, which, on being touched, suddenly recede, contract, and fall down in a very wonderful manner; all of them garnished with pinnated leaves, and monopetalous, funnel-shaped, five-parted, polygamous flowers at the axillas and ends of the branches, in clusters and spikes.

Class and order, *Polygamia Monœcia*.

[*Characters*.] Herinaphrodite and female flowers,

flowers, — CALYX is monophyllous, small, and quinque-dentate. COROLLA is monopetalous, funnel-shaped, and five-parted at the brim. STAMINA, many long capillary filaments, and incumbent antheræ. PISTILLUM, an oblong germen, short filiform style, and truncated stigma. PERICARPIUM, a long pod, having transverse partitions, containing many roundish seeds.

The name *Mimosa*, of this genus, signifying to mimic, originates from the sensibility of the leaves, which, by their motion on being touched, mimic, or imitate, as it were, the motions of animals.

To this genus Linnæus joins many of the *Acacias*, and it comprises upwards of forty different species; though not more than a quarter of them are common in the English gardens; or that possess any particular merit either for curiosity or ornament, and none for use. Of the sorts cultivated here in our stoves, &c. some are of the shrub and tree kind, and two or three are herbaceous perennials and annuals; are mostly of the sensitive kinds, except the *Acacia* sorts, which are motionless, as expressed under their proper heads, i. e. Sensitive and humble kinds, and Insensitive kinds. The former of which are exceedingly curious plants in the very singular circumstance of their leaves receding rapidly from the touch; for the leaves being winged, each composed of numerous small lobes, all of which on being touched, hastily run up close together; and in some sorts the foot-stalk and all is affected, so as instantly to fall downward.

Shrubby, Sensitive, and Humble Kinds.

They have all winged leaves, each wing of many small pinnæ; some only contract the lobes of the leaves and pinnæ at the touch; others not only contract every part of their leaves, but which, together with their foot-stalks, suddenly drop downward; and for distinction sake, the former are called Sensitive *Mimosas*, and the latter Humble Sensitive; but the leaves of both sorts soon recover their usual position.

1. MIMOSA *sensitiva*.

Common Sensitive Plant.] Rises with an under-shrubby prickly stem, branching six or eight feet high, armed with crooked spines; conjugated, pinnated leaves, with bijugated partial lobes or wings, having the inner ones the least, each leaf on a long foot-stalk; and at the sides and ends of the branches many purple flowers in roundish heads, succeeded by broad, flat, jointed pods, in radiated clusters.

This is somewhat of the humble-sensitive kind; the leaves, foot-stalks and all, recede

from the touch, though not with such facility as in some of the following sorts.

2. MIMOSA *pudica*.

Modest, or Humble Sensitive Plant.] Rises with an under-shrubby, declinated, prickly stem, branching two or three feet around, armed with hairy spines; pinnated-digitated leaves, each leaf being of five or more long folioles, attached by their base to a long foot-stalk, and spread out above like the fingers of a hand; and at the sides and ends of the branches roundish heads of greenish-white flowers, succeeded by small, jointed, prickly pods.

This is truly of the humble sensitive kind; for by the least touch the leaves instantly recede, contract close, and, together with the foot-stalk, quickly decline downward, as if humbling at the approach of the hand.

3. MIMOSA *pernambucana*.

Pernambuca Slothful Mimosa.] Hath under-shrubby, procumbent, unarmed stems, branching two or three feet around; bipinnated leaves, of three or four pair of short, winged foliola; and at the axillas drooping spikes of pentandrious flowers, the lower ones castrated.

This sort receding very slowly from the touch, only contracting its pinnæ a little when faintly touched; hence the name Slothful Mimosa.

4. MIMOSA *asperata*.

Rough Sensitive Mimosa.] Hath a shrubby, upright, prickly, hairy, rough stem, branching four or five feet high, armed with short, broad, whitish spines; bipinnated, prickly leaves, of five or six pair of foliola or wings, arranged opposite, having longer thorns between each pair; and at the upper axillas globular heads of purple flowers, succeeded by short, flat, jointed pods, in clusters, spreading each way like a radius.

This is only moderately sensitive in its foliola, but not in the foot-stalks.

5. MIMOSA *punctata*.

Punctated Sensitive Mimosa.] Rises with a shrubby, upright, cylindric, punctated or spotted, unarmed stem, branching erectly five or six feet high; bipinnated leaves, of four or five pair of long, winged folioles, having each about twenty pair of pinnæ; and at the axillas and termination of the branches oblong spikes of yellowish decandrious flowers, the inferior ones castrated; succeeded in the upper ones by oblong seed-pods.

This sort, though naturally shrubby and perennial in its native soil, yet in this country sometimes decays in winter.

It is only sensitive in the foliola, but quick in the motion.

6. MIMOSA

6. *MIMOSA virgata*.

Twiggy Sensitive Plant.] With erect, angulated stems, without spines; doubly-pinnated leaves, and spikes of decandrious flowers.

7. *MIMOSA pigra*.

Slow American Sensitive Plant.] Prickly, polished stems; with doubly-pinnated, opposite, prickly leaves; and longer erect spines, singly between the pinnæ.

Herbaceous, Sensitive, and Humble Kinds.

Of these sorts two are perennial, of the trailing kind; and one is annual, of somewhat erect growth; have all winged leaves, with the wings formed of many small pinnæ.

8. *MIMOSA viva*.—(*Perennial*.)

Lively Sensitive Mimosa.] Hath herbaceous, trailing, unarmed, repent stems, very branchy, spreading widely around, rooting at the joints as they advance; conjugated pinnated leaves, with quadrijugated, roundish, partial lobes or wings; and at the axillas globular heads of yellowish flowers, succeeded by short, flat, jointed pods.

This species is only sensitive in the foliola, but is the most lively of that kind, it being so susceptible that all the foliola recede rapidly from the least touch, whereby it has the distinctive appellation of vivacious, or lively *Mimosa*.

9. *MIMOSA quadrivalvis*.—(*Perennial*.)

Quadrivalve-podded Humble Mimosa.] Hath herbaceous, slender, quadrangular, prickly stems, branching and spreading all around, armed with recurved spines; bipinnated leaves of two or three pair of winged lobes, having each many pinnæ; and at the axillas globular heads of purple flowers, succeeded by quadrivalvular pods.

This is of the humble sensitive kind; both leaves and foot-stalks recede from the touch.

10. *MIMOSA plena*.—(*Annual*.)

Double-flowered Sensitive annual Mimosa.] Rises with an herbaceous, erect, round, unarmed stem, closely branching and spreading every way, two to three or four feet high; bipinnated leaves of four or five pair of winged lobes, of many pairs of pinnæ; and at the axillas and termination of the branches spikes of yellow pentandrious flowers, the lower ones double; succeeded by short, broad pods.

This annual is only sensitive in the foliola, but extremely susceptible of the touch or open air.

Shrubby mostly Insensitive Kinds.

These are of the *Acacia* kind, formerly a distinct genus, but now all species of *Mimosa*; but their leaves are destitute of motion or sensibility at the touch; there are about six or eight noted species, and several others in the English gardens, all for the show.

11. *MIMOSA cornigera*.

Horn-bearing Mexican Mimosa, commonly called Great Horned Acacia.] Hath a shrubby, upright, deformed stem, branching irregularly, armed with very large, horn-shaped white spines, by pairs, connated at the base; bipinnated leaves thinly placed; and flowers growing in spikes.

This species is esteemed a curiosity for the oddity of its large spines, resembling the horns of animals, and which are often variously wreathed, twisted, and contorted.

12. *MIMOSA farnesiana*.

Farnesian Fragrant Acacia.] Hath a shrubby stem, branching many feet high, armed with distinct spines; bipinnated leaves, having eight pair of partial lobes or wings; and globular, close-sitting spikes of yellow, sweet-scented flowers.

13. *MIMOSA nilotica*.

Nilotic True Egyptian Acacia.] Hath an upright tree-stem, branching many feet high, armed with spreading spines; bipinnated leaves; and globular spikes of flowers, having foot-stalks. From the exsudation of the leaves of this sort, and expressed juice of the unripe seed-pods, are procured the drugs called *Succus Acaciæ* and *Gum-arabic*.

14. *MIMOSA verticillata*.

Whorled-leaved Mimosa.] Hath a shrubby upright stem, branching irregularly and unarmed; the radical leaves are few in number, and pinnate; but those on the branches grow in whorls, linear, and pointed; the flowers are oblong and yellow, growing from the sides of the branches, one, two, or three together.

15. *MIMOSA pinnata*.

Feathery Winged-leaved Ceylon Acacia.] Rises with a firm angular stem, closely beset with small, robust, hooked spines; and slender, soft feathery, doubly-winged leaves, of about fifteen pair of small lobes, a little sensible to the touch, and composed each of a great number of lesser pinnæ close together, placed almost imbricatum; and white flowers disposed ornamentally on the summit of the branches in small clusters opening radiantly.

This is a very beautiful and elegantly-ornamental shrub.

16. *MIMOSA latifolia*.

Broad-leaved American Acacia.] Without thorns; conjugated-pinnated leaves, the terminal pinnæ opposite, and the lateral ones alternate.

17. *MIMOSA latifolia*.

Broad-podded American Acacia.] With flexuose, thornless branches; doubly-pinnated leaves, the wings having five pair of partial lobes, and broad seed-pods.

18. *MIMOSA*

18. *MIMOSA horrida*.

Horrid-thorned Indian Acacia.] With smooth branches, stipular thorns longer than the leaves, which are doubly-winged, and have mostly six pairs of partial lobes.

19. *MIMOSA arborea*.

Tree Jamaica Acacia.] Having a tree-like stem, thornless; smooth, doubly-pinnated leaves, halved acute pinnæ.

20. *MIMOSA tamarindifolia*.

Tamarind-leaved American Acacia.] Prickly; with doubly pinnated leaves of five pair of wings, having ten pair of partial folioles; and the common petiole prickly.

21. *MIMOSA circinalis*.

Ring'd-podded American Acacia.] Prickly, with conjugated-pinnated leaves, having equal pinnæ; and prickly stipulæ.

22. *MIMOSA glauca*.

Glaucous, or Sea-green American Mimosa.] Unarmed or thornless; doubly-pinnated leaves of six pair of partial folioles, with numerous lesser pinnæ; glands between.

23. *MIMOSA lebeck*.

(Lebeck)—or Monadelphous Egyptian Mimosa.] A tree stem, thornless; doubly pinnated leaves, of four pair of partial wings composed of oval-oblong pinnæ; and flowers monadelphous, bundled, peduncled.

The above twenty-three species of *Mimosa* are the most noted sorts in the English gardens; all the shrubby kinds are durable in root, stem, and branches; those of the perennial herbaceous kinds are also often abiding; but the annual sort always perish root and branch at the approach of winter. They are all natives of the Indies, and in this country require the continual shelter of a hot-house, or of a hot-bed of similar temperature under frames and glasses; though they can hardly be supported alive in winter unless placed in a stove; so all the sorts must constantly be kept in pots, and placed principally in that department, especially during the winter; nor will they succeed well in the open air in summer, except about a month during the greatest heat; but the sensitive and humble kinds, if exposed to the open air even in the hottest days, will be deprived of their sensibility during the time they remain so exposed, therefore should always be kept under glasses, in a stove if possible; or in default of such a convenience, the plants might be raised from seed in spring in any common hot-bed under frames, &c. as directed for tender annuals, and continued constantly under the glasses, and thereby will afford pleasure all summer by the oddity of their sensitive foliage; however, to have them to remain in perfection the year round, some

must be continued always in a stove, as before observed; for the warmer they are kept, the stronger will be their sensitive quality.

The sensitive and humble kinds, in particular, frequently flower in this country, and produce seeds: the *Mimosa farnesiana* is also often very floriferous here, and the flowers are very fragrant; the flowers of all are, separately, but small, but generally grow in bunches; each flower is monopetalous and funnel-shaped, with many stamina. See the *Characters*.

The sensitive and humble plants are in great estimation among the curious for the singular sensibility lodged in their leaves; which have two kinds of motion, the one occasioned by the action of warm nourishing vapours; the other artificial, in consequence of being touched or shaken, so as with whatever body it is touched or irritated, either by the hand, a stick, or the least wind blowing, the wings of the leaves suddenly close, and the foot-stalks fall down; but they all soon recover their proper position, especially in a warm stove.

It is remarkable, the sensibility of some resides particularly in the articulation or joinings of the lobes of the leaves to the partial foot-stalks, as in the simple sensitives; in others both in the joinings of the lobes, and in the articulations of the mid-rib, to which they are attached, as also to the main or common foot-stalk, as in the humble sensitive kinds.

The motion of these plants is owing to a strong contraction; each foot-stalk seems to terminate with a kind of joint, on which the lobes and leaves turn in all directions with surprising facility, and the main foot-stalk seems attached to the branches by a joint, so as to turn up and down as by a hinge.

In the experiments of trying the sensibility of these plants, in touching the upper leaves, if in contracting they fall and touch those below them, those will also all contract and fall, so that as one touches another they will continue falling successively for a considerable time in a curious manner.

The time which the leaves, &c. require to recover themselves, after falling by any touch or irritation, is according to the vigour of the plant, hour of the day, serenity of the atmosphere, and temperature of the heat of the stove, &c. so are often from about ten or fifteen minutes to an hour or more, before they are fully reinstated in their former proper positions.

It is remarkable that the plants each evening naturally contract themselves, and expand again in the morning.

Propagation and Culture of all the Sorts.

The propagation of all the sorts both sensitives and *Acacias*, is by seed in spring in a

hot-bed, or in the bark-bed in the stove; and some of the sensitive kinds also by layers and cuttings.

By Seed.—It is sold at the nurseries and seed-shops. Sow it in pots of light rich mould, covering it with fine earth a quarter of an inch deep, and plunge the pots in the hot-bed; if in a common hot-bed under frames and glasses, manage them nearly as directed for tender annuals, such as the *Amaranthus tricolor*, and others of that quality; and if in a bark-bed in the stove, very little trouble is required: observing to give moderate sprinklings of water, and when the plants are two or three inches high, prick them singly in small pots, which plunge also in the hot-bed, &c. giving water and occasional shade till rooted, repeating the waterings frequently; and continue the plants in the hot-bed under glasses, or plunged in the bark-bed of the stove, being both necessary to facilitate their growth, preserve them in vigour, and increase the sensibility of the sensitive kinds; allowing air in common with the other plants in the bed. Remarking, that to preserve the perennial sorts, both shrubby and herbaceous, they must be kept in the stove all winter, and indeed principally the year round, when they will be of several years' duration, flower in summer, and ripen seeds in autumn, particularly some of the sensitive kinds.

But in want of a stove, as before hinted, those who are curious to have some sensitive plants, may nevertheless have the pleasure of them in summer, by aid of a common dung or tan-bark hot-bed under frames and glasses, but not in winter; that is, raise some plants, either of the annual sort or any of the other kinds, by seed in spring, in a hot-bed under a frame, &c. as above directed, keeping up the heat of the bed until the middle of June, and continue the plants always under the frame, raising one end of the lights a little, occasionally, in warm days to admit fresh air; and as the plants rise in height, raise the frame at bottom, to allow them full room to grow; or about Midsummer, or soon after, some of the low spreading kinds may be turned out with balls, or plunged in their pots into a warm sunny border, and covered with large hand-glasses which may be lifted off occasionally just to view the plants. By those methods the plants may be preserved through the summer in their sensitive quality, though not equal in perfection to those in stoves; nor can they be preserved alive in winter out of a stove.

By Layers.—Any of the shrubby kinds that afford spreading branches may be layed any time in summer, in pots plunged in the bark-

bed, where they will readily take root, and be ready to pot off singly in autumn.

By Cuttings.—The sensitive and humble kinds often branch out profusely, so as to furnish plenty of young shoots in summer, of which take cuttings, plant them in pots, and plunge them in the bark-bed; they will readily take root and form proper plants.

But after all, seedlings generally form the best plants; however, any of the other two methods is eligible in default of seed.

With respect to the general culture of all the species, they must always be kept in pots, and placed in the stove, plunged occasionally in the bark-bed, especially the spreading sensitive kinds, giving frequent watering both in summer and winter, but most in the summer season; shifting them into larger pots as they increase in growth: observing, that although most of the sorts will live in the open air in the heat of summer, it will be best to expose them but sparingly; rather, if removed out of the stove in that season, place them in an airy glass-case for a month or two, moving them to the stove again in due time towards the autumn.

MIMULUS (Monkey Flower), or American Fox-glove.

This genus comprehends one species for our notice, an herbaceous very ornamental-flowering perennial for the pleasure-garden.

Class and order, *Didynamia Angiospermia*.

Characters.] CALYX, an oblong, five-cornered, five-dented, permanent cup. COROLLA, ringent, monopetalous, bilabiated; the upper lip erect, bifid, reflexed on the sides, the under one broad, trifid, with roundish segments, the middle one smallest. STAMINA, two longer and two shorter filaments, and bifid, reniform antheræ. PISTILLUM, a conical germen, slender style, and an oval, bifid, compressed stigma. PERICARPIUM, an oval, bilocular capsule, with many seeds.

The species is,

MIMULUS ringens.

Ringent American Fox-glove of Canada.]

Rises with upright square stalks two feet high; oblong, pointed, smooth, opposite leaves, surrounding the stalk, and at the axillas large, ringent, blue flowers, in July, beautifully ornamental, succeeded by capsules filled with ripe seeds in autumn.

This herbaceous perennial being a very ornamental-flowering plant, is eligible to introduce in the principal flower compartments in assemblage with others, in which it will make a conspicuous appearance in its beautiful flowers; may be planted in autumn or spring; and is propagated either by parting the roots, or by seeds in the same season.

MIRABILIS, Marvel of Peru, or Four-o'clock flower.

This genus consists of three species of large-growing, bushy, very floriferous perennials, from Peru in South America, admirably ornamental for the pleasure-ground in summer, but which, although naturally perennial, generally prove annual here; all of them, however, rising with annual stalks, three or four feet high, branching widely all around; closely ornamented with large, oblong, entire leaves; and numerous beautiful, monopetalous, funnel-shaped flowers, of beautiful colours.

Class and order, *Pentandria Monogynia*.

Characters.] **CALYX** is pentaphyllous, erect, ventricose, the leaves oval and persistent. **COROLLA** is monopetalous and funnel-shaped, having a long slender tube resting on the nectarium; the limb or upper part erectly spreading, plaited, and obtusely quinquefid, and with a globose nectarium under the corolla. **STAMINA**, five slender, unequal, inclined filaments, and roundish antheræ. **PISTILLUM**, a roundish germen within the nectarium, slender style, and globular stigma. **PERICARPIUM**, none; the seed is an oval pentagonous nut.

There are but three species common to our gardens, all of which are natives of Peru originally, and in this country are tender, generally requiring to be forwarded in spring in a hot-bed until June.

The species are,

1. **MIRABILIS Jalapa.**

(*Jalapa, Jalap*)—or *Common Marvel of Peru*.] Hath a large, thick, fleshy root; an upright, thick, jointed stalk, dividing and branching numerously, widely, and erectly, a yard or more high; garnished with oblong, broad, opposite leaves; and all the branches and shoots terminated by numerous flowers in clusters, of different colours in the varieties.

Varieties.] With white flowers—with yellow flowers—with purple flowers—with red flowers—with white and yellow flowers—white and purple flowers—purple and yellow flowers—red and yellow flowers.

Several other varieties often rise from seed; and it is remarkable that although several of the above colours and variegations are sometimes common to the same plant, yet it is rare that a plant of this species produces flowers of one of those colours alone; sometimes, however, the same plant will exhibit only white and purple flowers separate, and sometimes both colours in the same flowers, intermixed with the plain ones; the same is also observable in the red and yellow; others have plain

flowers of several different colours; and sometimes variegated flowers also on the same plant.

The root of this species was supposed to be the true officinal jalap, but which is since discovered to be the root of a species of *Convolvulus*.

2. **MIRABILIS longiflora.**

Long-flowered Mirabilis.] Hath a large, thick, fleshy root; a thick stalk, dividing low into many declinated spreading branches, extending two or three feet every way; large, heart-formed, hairy, viscous leaves, in opposite pairs; and all the branches and shoots terminated by white flowers in clusters, having very long tubes, nodding downward.

3. **MIRABILIS dichotoma.**

Forked Mirabilis.] Hath a thick fleshy root; an upright, thick, swollen, jointed stem, branching forkedly, two or three feet high; oblong opposite leaves; and smallish red flowers at the axillas, singly, and close-fitting.

All these plants flower in July, continuing in plentiful succession until October, very conspicuous and elegant. Having the singularity of being shut very commonly all the fore part of the day, and expanding towards the evening when the sun declines; hence the inhabitants of the countries where they grow naturally, called them Four-o'clock flowers: their time of opening here, however, depends on the weather; for if cloudy, or that the sun is not very vehement, they often open great part of the day.

The flowers are universally hermaphrodite, and of one funnel-shaped tubular petal, having the lower part a long narrow tube, and the upper spreading. See the *Characters*.

These plants are naturally perennial in root, which, however, if not preserved here in winter, proves but of one summer's duration; but if sheltered from frost and wet during the winter season, they will remain alive, and shoot out strongly again in spring: in this country, however, the plants are commonly considered as annuals; because they rising from seed in the spring, and the same year produce flowers and perfect seed; and if left to nature in the open air, totally perish in winter, at the first attack of frost or excessive wet; but, as aforesaid, if in autumn when the stalks begin to assume a state of decay, the roots are taken up, and preserved in sand in a dry room all winter, and planted again in spring, they shoot out afresh stronger than at first, and sometimes obtain four or five feet stature, with very spreading heads; or if plants growing in pots, having the stems cut down in autumn, and the pots placed in a greenhouse,

house, or garden-frames under glasses, the roots may also be preserved sound, and will shoot out again in spring as above.

The roots generally become large, tuberous, and fleshy, covered with a dark rind.

All the species are of a tender nature, scarcely able to endure the open air here fully day and night, until May or June; that is, being raised from seed in spring, chiefly in hot-beds under glasses, continued and forwarded there until the beginning of June, then fully exposed in the borders or pots, they become large branchy plants in July and August, and continue flowering until October or November, till prevented by the cold.

They are all elegant furniture for the principal compartments of the pleasure-ground, they being both very ornamental in their large branchy growth, closely garnished with leaves, and by flowering so numerously seem as if entirely covered with flowers, in constant plentiful succession from July till the beginning of winter, as aforesaid.

The root of all these plants is a strong purgative, and given in a double quantity operates equal to the true jalap,

Their Propagation and Culture.

The propagation of all the species is by seed in the spring, either in a warm border, or in a hot-bed; but the latter will forward the plants to considerably the earliest and greatest degree of perfection.

First, by raising them in warm borders.—Remark, we only recommend this in default of the convenience of hot-beds; and towards the middle of April is the proper season for this mode of sowing these sorts: choose a warm south border, open to the sun; there sow the seed in shallow drills, half an inch deep, and six inches asunder: if the place is covered with hand-glasses, or with a frame and lights, or the seed sown in pots under those protections, or any other occasional shelter on nights and cold weather, it will forward the germination of the seed, and growth of the young plants: in June they will be fit to transplant into the borders or in pots: choose moist weather, and give water and occasional shade till rooted; they will then readily grow and acquire a tolerable size; but these will hardly attain a large size, or flower so early by a month or six weeks, as those brought forward in a hot-bed according to the following directions.

By hot-beds.—By sowing and forwarding in hot-beds, under frames and glasses, is the only method by which we can obtain the Marvel of Peru in due perfection in the proper season: therefore in March, or early in April, prepare a hot-bed under frame and lights, or

a general hot-bed for these and other tender kinds, as directed for tender annuals, such as balsamine, &c. and earth it all over about six inches deep; sow the seed in the earth of the bed, in shallow drills half an inch deep, as aforesaid, or in pots of rich earth the same depth, plunging them in the earth of the bed. The plants will soon rise; indulge them with fresh air daily, in common with other plants of the bed, by raising the glasses, and give frequent refreshments of water. When they are near two inches high, prick them into another fresh hot-bed to forward them, placing them either in the earth of the bed, four or five inches asunder, or plant them singly in small pots (thirty-twos), and plunge them in the bed: as soon as planted, give water, and shade them from the mid-day sun occasionally till fresh-rooted, continuing the care of admitting fresh air every mild day; and towards the middle or latter end of May, when they have acquired some size and strength, begin to inure them by degrees to the full air, so as by the first or second week in June they may be removed into it fully; at which time choose mild cloudy weather, if showery the better; take up those growing in the bed, with balls of earth about their roots, and plant them in the borders; or if in pots, they may be readily turned out with the whole ball entire, and planted without their ever shrinking or feeling their removal; some may also be planted in large pots to remain in order for moving to ornament any particular compartment: observing to give water directly, and bestow occasional shade to such as shall require it, together with a repetition of waterings to the whole, till they have struck fresh root and begin to grow: after this they will not require any farther culture, except occasional support of stakes, which will be more particularly necessary in the *Mirabilis longiflora*.

They will mostly begin flowering in July, and will furnish plenty of ripe seed in autumn for the purpose of propagation another year.

But as we before suggested, if the roots are taken up in autumn, i. e. October, or early in November, dried, cleaned, and laid in dry sand, in any dry room, secure from frost and wet, they will remain sound; and in spring, if planted in large pots, and in March or April plunged in a hot-bed under a deep frame, they will shoot out remarkably strong, sometimes four or five feet high, and will flower earlier by a month than seedlings of the same year.

Or such of the plants as grow in pots, having their stems cut down in October or November, and placed in their said pots in a green-house, near the windows all winter,

ter, kept from wet; the roots will remain sound; and in spring treat them as above.

MOMORDICA, Male Balsam Apple.

The plants are herbaceous trailers, of which there is a hardy perennial, cultivated both for variety and medical use, having long trailing stalks, garnished with broad simple leaves, and monopetalous monœcious flowers.

Class and order, *Monœcia Syngenesia*.

Characters.] CALYX, male and female flowers apart on the same plant, having monophyllous, concave, five-parted cups, and those of the females are placed on the germen. COROLLA is monopetalous, large, rough, spreading, and adheres to the calyx. STAMINA, three awl-shaped filaments in the males, with united antheræ, two of them bifid, one single. PISTILLUM, a large germen under the corolla, cylindric style, and a trifid, oblong gibbous stigma. PERICARPIUM, an oblong-oval trilocular fruit, opening with elastic force, filled with many compressed seeds.

There are several annual species of but little merit; but the sort commonly cultivated is the following perennial.

MOMORDICA *Elaterium*.

(*Elaterium*)—or *Wild Spurring Cucumber*.]

Hath thick, fleshy, spreading roots; many trailing, angular, rough stalks, branchy and spreading two or three feet all around; garnished with large, angular, heart-formed, rough, grey leaves, on long rough foot-stalks; at the axillas small, monœcious, yellow flowers, succeeded in the females by oval, cucumber-like, hispid fruit, that dart out their seeds with great velocity.

This species is one of the *Noli me tangere* or Touch-me-not kinds; for upon handling the ripe fruit, it instantly bursts with elastic violence, and discharges its juice and seeds with amazing force all around to a great distance, often causing consternation to strangers who happen to touch them, though they also burst open naturally, and disseminate their seeds in a similar manner.

This plant is very hardy, and grows freely from seed in the common ground, and is of several years' duration.

The fruit affords the officinal elaterium for medicine.

The propagation of this plant is by seed in autumn or spring, in a bed of common earth, sown either by broad-cast and raked in, or in drills half an inch deep; and when the plants have leaves two inches broad, transplant them, those intended for use in rows three or four feet asunder; and may also disperse some in the pleasure-ground for variety; give occasional watering till fresh-rooted.

From the self-sown or scattered seeds, many young plants often rise spontaneously.

MONADELPHIA, the name of the sixteenth class of the Linnæan system, consisting of plants with hermaphrodite flowers, having all the stamina monadelphous or united into one body, with the style passing through them: examples of monadelphous plants are hollyhock, lavatera, marsh-mallow, &c. and it consists of five orders, arising from the number of styles (five). See CLASSIS.

MONANDRIA, the name of the first class in the Linnæan system, consisting of plants with hermaphrodite flowers, having but one stamen. Examples of Monandrous plants are Indian arrow-root, blite, &c. and it consists of two orders, derived from the number of styles (two). See CLASSIS.

MONARDA, Oswego Tea, or Lion's-Tail.

It consists of herbaceous, fibrous-rooted, floriferous perennials and biennials, of upright growth, for the pleasure-ground, rising with angulated erect stems, two or three feet high, adorned with oblong simple leaves, and terminated by large heads of monopetalous ringent flowers.

Class and order, *Diandria Monogynia*.

Characters.] CALYX is monophyllous, tubulous, cylindric, channeled, five-parted at top, and permanent. COROLLA is monopetalous, with a cylindric tube, ringent above, divided into two lips, the upper one narrow and entire, and the under broad, reflexed, and three-parted. STAMINA, two bristly filaments involved in the upper lip, and compressed erect antheræ. PISTILLUM, a quadrifid germen, filiform style, involved with the stamina, and acute bifid stigma. PERICARPIUM, none; four naked seeds lodged in the calyx.

There are about three species cultivated in our gardens; they are all North American plants, and hardy enough to succeed here in the open ground; proper for ornamenting the pleasure-garden as flowery plants.

The principal species are,

1. MONARDA *fistulosa*.—(*Perennial*).

Fistulous Canada Monarda.] Hath a fibry, strong, spreading root; upright, obtuse-angular, hairy stems, rising a yard high, branching out at top; oblong, broad-based, pointed, hairy, opposite leaves, on long foot-stalks; and all the stalks and branches terminated by large heads of fistulous purple flowers.

2. MONARDA *didyma*.—(*Perennial*).

Didymous Pennsylvanian Scarlet Monarda, or Oswego Tea.] Hath a creeping root, upright, acute-angular stems, rising two feet high; oval-lanceolate, smooth, opposite leaves,

on short foot-stalks; and the branches terminated by large heads of bright-red flowers, having sometimes didymous antheræ.

Variety.] With the floral leaves highly coloured and larger scarlet flowers.

The leaves of this species are remarkably odoriferous, and in North America are sometimes used for tea.

3. *MONARDA punctata*.—(*Biennial*).

Punctated Virginian Monarda.] Hath fibry roots; upright square stalks, branching quite from the bottom to top, about two feet high; spear-shaped, serrated leaves, of different sizes, in clusters at each joint; and large verticillate, yellow flowers, having the corolla punctated or dotted with purple.

All these plants flower here abundantly in July, make a very ornamental appearance; succeeded by ripe seed in autumn, by which all the sorts may be raised; the perennial sorts also by roots and cuttings. See the *Propagation*.

The flowers are universally hermaphrodite, monopetalous, and ringent, numerous and collected into heads, each having a leafy involucre.

All the three species are very hardy: the first and second are perennials, the other is biennial, and sometimes annual, if raised early in spring. They all succeed in any open compartment, and are proper furniture for the embellishment of the pleasure-ground, in the elegance of their flowers, which are very conspicuous, continuing long in full beauty, and are all fine aromatics.

The propagation of all the sorts is by seed; the perennials also by parting the roots, and by slips and cuttings.

By Seed.—Sow it in autumn, or early in spring, in a bed of good earth, and rake it in: the plants will soon rise, and be fit to prick out in June, in nursery rows half a foot asunder, giving water, and let them remain till October or November, then transplant them where they are to flower.

By parting the Roots.—Autumn or early in the spring is the proper time, when, of the two perennial sorts, divide or slip the roots into sets; almost every bit will readily grow, planting them either in a nursery for a year, or, if strong, at once where they are to remain; and each will flower next summer.

By Slips, &c.—In May or June take off some robust slips or cuttings of the branches, five or six inches long; plant them in a shady border, giving occasional waterings, and they will readily grow, and form good plants by autumn.

MONŒCIA, the name of the twenty-

first class in the Linnæan system, consisting of plants with male and female flowers, separated on different parts of the same plant. Examples of monœcious plants are cucumber, melon, gourd, &c. and it consists of eleven orders, from the number of styles (eleven). See CLASSIS.

MONOPETALUS *Flos*, a Monopetalous flower, or of one petal: applicable to flowers only; and a corolla formed of one leaf, or petal, is termed Monopetalous. A Monopetalous corolla is sometimes wholly entire, without any division; sometimes is cut into two parts, *bifidus*; in three, *trifidus*, or *tripartite*; in four, *quadrifidus*; in five, *quinquefidus*; in many, *multifidus*, &c. See COROLLA.

MONOPHYLLUS, Monophyllous, or one-leaved, applicable most commonly to the calyx of flowers; for a calyx of one leaf only is termed Monophyllous, and which sometimes consists of one entire piece without divisions, *integerrimus*; sometimes cut into two, *bifidus*; some into three, *trifidus*; in four, *quadrifidus*; in five, *quinquefidus*; in many, *multifidus*, or *multipartite*. See CALYX and PERIANTHIUM.

MONSONIA (*Monsonia*).

A genus of perennial undershrubby plants for the green-house, with cordate leaves and quinquepetalous flowers.

Class and order, *Polyadelphia Dodecandria*.

Characters.] CALYX, pentaphyllous, five-parted, lanceolate, and permanent. COROLLA, five oval, indented, spreading petals. STAMINA, twelve to fifteen polyadelphous filaments, joined below in five sets, topped with oblong antheræ. PISTILLUM, a short pentagonal germen: style, awl-shaped, with five oblong stigmas. PERICARPIUM, a pentagonal capsule with five cells, each containing a single seed.

The species are,

1. *MONSONIA lobata*.

Lobated, Broad-leaved Monsonia.] Monsonia with lobate, heart-shaped, dentated leaves.

2. *MONSONIA speciosa*.

Specious-flowered Monsonia.] Monsonia with quinate leaves, the folioles deeply divided, and a large dentated spreading flower.

3. *MONSONIA ovata*.

Ovate undulated Monsonia.] Monsonia with waved, oblong, heart-shaped, emarginated leaves.

The first and second species are perennial, the third is biennial: they are beautiful African plants, have great affinity to the Pelargoniums, and they are propagated and treated in the same manner. See PELARGONIUM.

MORÆA (*Moræa*).

This genus furnishes for the green-house three species of herbaceous, bulbo-tuberous-rooted, flowery perennials, from Africa, growing with long, narrow, and sword-shaped leaves; and upright flower-stalks, six or eight inches high, terminated by a bivalvous spatha, protruding one or two hexapetalous, blue, whitish, and other coloured flowers.

Class and order, *Triandria Monogynia*.

Characters.] **CALYX**, a bivalve spatha. **COROLLA**, six spear-shaped petals; the three interior ones are spreading, and the others erect. **STAMINA**, three short filaments, topped with oblong antheræ. **PISTILLUM**, a germen below the flower, style simple, and crowned with three bifid stigmata. **PERICARPIUM**, a three-cornered three-furrowed capsule, with three cells, containing many round seeds.

The species are,

1. **MORÆA vegeta**.

Grass-leaved Moræa.] Hath oblong, bulbous roots, from which arise three or four long, narrow, grassy leaves, and a foot-stalk supporting a small blue flower.

Varieties.] Small-flowered—great-flowered.

2. **MORÆA iridioides**.

Iris-like, Sword-leaved Moræa.] Hath a bulbous root, with sword-shaped leaves, and foot-stalks terminated by two larger pale-blue flowers, with a yellow spot at their bottom.

3. **MORÆA juncea**.

Rushy, awl-shaped Moræa.] Awl-shaped leaves; and the spatha or sheath protruding two orange-coloured flowers.

These species are perennial-rooted plants, and are propagated by off-sets from the old roots in autumn or spring, also they may be raised from seeds to obtain new varieties: sow the seed as soon as it is ripe, in August, in pots, and the plants will come up the spring following, which in autumn should be transplanted into single pots, but must be protected in winter by glasses, &c. or placed in the green-house.

MORINA (*Morina*).

For our purpose is one species, an hardy, herbaceous, flowery perennial for adorning the pleasure-ground, growing with upright stalks, prickly leaves, and heads of long tubulous, labiated flowers.

Class and order, *Diandria Monogynia*.

Characters.] **CALYX**, a double cup, each monophyllous, tubular, two-parted, permanent. **COROLLA**, monopetalous, labiated, long, tubular, slender below, wide above, the limb plane, a little recurved, with the up-

per lip semi-bifid, the lower trifid-obtuse. **STAMINA**, two setaceous, short filaments, with erect cordate antheræ. **PISTILLUM**, a globose germen, inferior, slender style, and capitated inflexed stigma. **PERICARPIUM**, none; a single seed lodged in its permanent cup.

The species is,

MORINA persica.

Persian Oriental Morina.] Hath a large, oblong, taper, fleshy main root, crowned with very large, oblong leaves, divided at the edges, armed with prickles; upright, strong, smooth stalks, a yard high, garnished with leaves, and lateral and terminal small heads of ornamental flowers of different colours in the varieties, succeeded by ripe seeds in autumn.

Varieties.] White-flowered—purple-flowered—pale-red—deep-red.

This being a very ornamental flowering perennial, should have a place in the principal flower-borders, &c. planted in spring or autumn: but observe, that as the main root is large and long, of the tap kind, striking deep into the ground, it should be removed in young growth, with great care, as entire and fibrously as possible; or it would be very eligible to raise the plants from seed sown in the places where it is designed they shall flower; permitted to remain unremoved, they will continue several years, and flower annually in summer.

It is propagated by seeds sown as soon as ripe, or in the spring, in a bed or border of light earth, principally to remain: the plants will come up freely and flower the year following.

Or by off-sets of the root:—when any occur, slip them off while young, and plant them finally to remain.

MORUS, Mulberry-tree.

This genus is wholly of the tree kind, and mostly deciduous; consisting of about six or seven species, four of them hardy for the open ground; some of which as fruit-trees, and some for variety; and two are tender exotics, rarely cultivated here: all of them adorned with large, roundish-heart-shaped, oval, and oblong, rough leaves; and monœcious apetalous flowers, the males in amentums, and the females in round heads, formed of the succulent calyxes, which become the fruit.

Class and order, *Monœcia Tetrandria*.

Characters.] **CALYX**, monœcious flowers, the males collected into amentums, having cups divided into four oval concave parts; and the females into small, round, close heads, having cups composed of four roundish, succulent, permanent leaves. **COROLLA**, none.

STA-

STAMINA, in the males, four subulate filaments, and simple antheræ. PISTILLUM, in the females a cordate germen, two subulate, long, reflexed styles, and simple stigmas. PERICARPIUM, none: each cluster or head of female calyxes become a large, oval, fleshy, succulent berry, full of tubercles, each tubercle having an oval acute seed.

The most remarkable species of this noted genus are the four following, all of hardy growth; the first of which is the common Mulberry of our gardens.

1. *MORUS nigra*.

Black-fruited common Mulberry-tree.] Rises with an upright, large, rough trunk, dividing into a large, branchy, very spreading head, rising twenty feet high or more; large, heart-shaped, rough leaves; and monœcious flowers, succeeded in the females by large, succulent, black berries.

Variety.] With jagged leaves and smaller fruit.

This species is the proper Mulberry-tree for general cultivation in this country for its fruit; the tree being a plentiful bearer, and the fruit ripen in good perfection in August and September.

2. *MORUS alba*.

White Mulberry-tree.] Rises with an upright trunk, branching twenty or thirty feet high; garnished with large, oblique-heart-shaped, smooth, light-green, shining leaves; and monœcious flowers, succeeded by pale-whitish fruit.

Variety.] With purplish fruit.

3. *MORUS rubra*.

Red Virginia Mulberry.] Grows thirty feet high; with very large, heart-shaped, rough leaves, hairy underneath; and monœcious flowers, succeeded by large, reddish berries.

4. *MORUS papyrifera*.

Paper Mulberry-tree of Japan.] Grows twenty or thirty feet high; with large palmated leaves, some trilobate, others quinquelobed; and monœcious flowers, succeeded by small black hispid fruit.

In the countries where this tree grows naturally, the inhabitants make paper of the bark of the young succulent shoots, prepared by boiling, purifying, beating, washing, and liquefying to a certain consistence, and is then, by a process of different preparations, made into paper.

All these trees are very hardy, and succeed in any common soil and situation. The *Morus nigra*, Black Mulberry, is the only sort proper to cultivate generally as a fruit-tree for its fruit: the others are principally employed here to form variety in our ornamental plantations;

of which the White and Paper Mulberry, are the most common, the red sort being very scarce in the English gardens; the black, and the white-fruited kinds, are also eminent for their leaves to feed silk-works, they being the principal food of these valuable insects; but the White Mulberry leaves are in the most esteem for this purpose; and abroad, in France and Italy, &c. vast plantations of the trees are made solely for their leaves to feed silk-worms, which amply reward the possessors with the annual supply of silk they spin from their bowels: plantations of the same trees has formerly been recommended in this country for the purpose of silk-worms, to introduce the manufacturing of raw silk, since it is observable that where the trees thrive, the silk-worms will also prosper: all recommendations, however, have proved fruitless, although it in time might probably turn to a national advantage.

The leaves of these trees are generally late before they begin to come out, the buds seldom beginning to open till the middle or towards the latter end of May, according to the temperature of the season; and when these trees in particular begin to expand their foliage, it is a good sign of the near approach of fine warm settled weather: the white Mulberry, however, is generally forwarder in leafing than the black.

The flowers and fruits come out soon after the leaves; the males in amentums, as before hinted, and the females in small roundish heads; neither of which are very conspicuous, nor possess any beauty, but for observation; the female or fruitful flowers always rise on the extremity of the young shoots, on short spurs; and with this singularity, the flowers and calyxes together being in close united heads, each head of calyxes becomes a fruit, which is of the berry kind, and being composed of many tubercles, each of these furnishes one seed. See *Characters*. The fruit ripens here gradually from about the middle of August until the middle of September; which in dry warm seasons ripen in great perfection; but when it proves very wet weather, they ripen but indifferently, and prove devoid of flavour.

Considered as fruit trees, the black-fruited kind is the only proper sort to cultivate, the trees being not only the most plentiful bearers in this country, as before noticed, but the fruit are larger, and much finer flavoured than the white kind, which is the only sort, besides the Black Mulberry, that bear any tolerable production of fruit in England.

The Black Mulberry, therefore, as a fruit-tree,

tree, may be trained either as a standard, half-standard, dwarf-standard, and as wall-trees and espaliers. Standards is the most common mode of cultivating them in gardens and orchards; and in which they bear very abundantly; but in large gardens, where there is scope to work upon, a few trees may be also trained in each of the other above methods, they will effect the greater variety; and those against walls and espaliers will generally have larger fruit, ripen sooner with an improved flavour; and which will be succeeded by those upon the standards: remark, however, to allot a sufficiency of standards to furnish the principal crop of fruit, which if for private use, half a dozen trees may be sufficient; though I have known one large tree furnish more Mulberries than was necessary for the supply of a great family.

The trees may be planted either in the kitchen-garden, orchard, or pleasure-ground, allowing them a dry situation and sunny exposure, both of which being requisite to promote the early ripening of the fruit, and give it due flavour. Standard Mulberries are often disposed singly on grass ground, in which, when grown up into spreading heads, they have a fine effect, and their fruit may be always readily gathered; though, when growing on cultivated ground, it is probable the fruit may be larger; the standards should stand twenty or thirty feet asunder at least, to give full scope to their spreading heads; and the dwarfs, for walls and espaliers, fifteen or twenty feet distance from one another; remarking, in all the above modes of training, not to practise any general shortening of the shoots, but, except on particular occasions, leave them mostly at full length; for as the fruit is produced near the ends of the young wood, shortening would be cutting off the parts designed by nature to yield the fruit. See their *Propagation*, &c.

Mulberry-trees are but slow growers; they, however, will begin to bear in moderately young growth; but they rarely bear any considerable quantity of fruit till they are many years old; and old trees are always not only the most fruitful, but the fruit larger and of a richer flavour.

Ripe Mulberries are an agreeable sweet fruit, of a refreshing relish, and fine cooling quality, and therefore excellent for the dessert; also proper for some culinary uses, as for tarts, &c. and the syrup of Mulberries is well known.

The bark of the root of these trees being a fine bitter astringent, is admirable for killing worms in the human body.

Propagation of all the Sorts.

The propagation of all the sorts is by seed, by layers, and by cuttings; also by grafting and inoculation.

By Seed.—All the sorts may be raised in amazing plenty from seeds in the open ground; but remarking, that when they are designed principally as fruit-trees, I would not recommend this practice, because the seedling trees are apt to vary, and out of numbers so raised, there may be but few good sorts, or that prove good bearers; therefore for fruit-trees, layers, cuttings, grafting, &c. are the only certain methods to continue the approved sorts. By seed, however, is eligible enough where large quantities are required for barren plantations, or for shrubberies, &c. It is generally procured from France or Italy; and March is the proper time of the year for sowing them, which may be either in a warm border, or in a moderate hot-bed, earthed half a foot thick, and arched with hoops, to be matted in nights and cold weather. Sow the seeds in shallow drills near half an inch deep: give refreshments of water occasionally; and when the plants appear, mat them in cold nights and morning frosts, repeating the waterings all summer in dry weather; and in winter continue the occasional shelter of mats when frosts approach. And after having two years' growth in the seed-bed, plant them out in nursery-rows two feet asunder, and half a yard apart in the lines: here let them remain a few years, training them for their several purposes, as above-mentioned, the principal part for standards, with single stems, six feet high; others for half-standards; and a few for dwarfs, heading down the dwarfs, while young, near the ground, to force out branches near the bottom, to train either for dwarf-standards, or for walls or espaliers.

But the following are the only methods of propagation by which we can with certainty continue the approved sorts; in all of which methods always, if possible, propagate from trees remarkable for bearing large fruit, and plentiful crops.

By Layers.—Where great quantities are required, some trees should be planted for stools, having the heads taken off near the ground to force out plenty of bottom-shoots near the earth for laying; for the branches of the full-grown trees are often so far from the ground, that they cannot be brought down low enough to be layed; in this case, however, where only a few are wanted, some large pots, boxes, or baskets of mould may be elevated upon stands near the branches proper for laying. In either method, lay the

shoots by slit-laying, heading them to one or two eyes; thus they will readily take good root, sufficient for transplanting by autumn following, in nursery-rows, as directed for the seedlings, and train them in the same manner.

By Cuttings.—October, November and spring are the proper seasons; choose young shoots of the former summer, from healthful good-bearing trees, cutting them off from about eight or ten to fifteen inches long, plant them in a shady well sheltered place, in rows, setting them two thirds at least in the ground; many of them will be properly rooted next autumn. But the most expeditious method is to give them the aid of a hot-bed; in March, therefore, plant a parcel of middling cuttings in pots of earth, and plunge them in any moderate hot-bed; it will greatly facilitate their rooting; being careful, when they begin to shoot, to harden them by degrees to the full air; give occasional shelter in the following winter, and in spring plant them out in the nursery-way, treating them as above directed.

By Grafting and Budding.—This is rarely practised, since they grow so freely by layers and cuttings; grafting and budding, however, are also certain methods for continuing the proper sorts; and when intended for practice, it must be performed on seedling stocks of any of the species, in the usual method.

Culture as Fruit-trees.

As before observed, they as fruit-trees may be trained both as standards in the open ground, and as dwarfs for walls and espaliers.

As Standards.—They may be both full standards, half-standards, and dwarf-standards, but principally as full or half-standards. To have them full standards, train them with a single, upright, clean stem, five or six feet high, then permit them to branch out laterally at that height to form a head. Half-standards train with four or five feet stems, then let them branch into heads. Dwarf-standards may have half a yard or two-feet stems, at which height encourage branches all around for a head (see STANDARD-TREES, DWARF-TREES, &c.), observing to assist the whole a little at first, when necessary, in forming their heads somewhat regular, by pruning irregular growths, as directed for other standard and dwarf fruit-trees. In either of these forms they may be planted out in the garden or orchard; where let them principally take their own natural growth, giving no other pruning than regulating or retrenching any cross disposed or other irregular branches, or thinning where much too close; or to shorten any particular long rambler; but never shorten the gene-

ral shoots, or only to prune off casual dead parts; for the fruit-spurs always arise towards the extreme part of the young wood, as already observed.

Thus will all these kinds of standard Mulberries gradually form themselves into a bearing state, though they rarely begin to bear any great quantity till twelve or fifteen years old.

As Dwarfs for Walls, &c.—Although the fruit ripen very well upon standards, yet when trained against walls and espaliers, the size and flavour is often considerably improved; therefore may have a few trees trained in both these ways, i. e. walls and espaliers, for variety: one mode of culture often serves both. They are at first to be headed down low in the nursery, to procure branches near the ground, as directed under the article DWARF-TREES, &c. then, being thus furnished with some lower branches, plant them against a south-wall, or in espaliers, fifteen feet asunder; where train their branches along horizontally, regularly to the right and left, six inches asunder, each at full length, for the reason already given, unless where shortening is necessary to obtain a supply of wood to fill the allotted space, which should be regularly covered with bearing-branches quite from bottom to top of the wall or espalier, at the above distance from one another; observing each year, in summer and winter pruning, to cut out all superfluous and irregular shoots; at the same time train, in different parts of each tree, some regular lateral shoots, both towards the lower and upper parts, to be coming forward to a bearing state, that every part of the tree may be filled with bearing shoots, advancing one after another; and as the foremost shoots become too long, and require cutting off, the laterals will, one after another, as just observed, be ready to supply their places; and likewise of such parts as become cankered or dead.

When these trees are required for plantations for variety, they should be trained up either to full stems, six feet high at least, and then suffered to branch out in their natural way, or may be trained as half-standards for smaller shrubberies, or even some as dwarfs, to cause a greater variety.

MOTUS, Motion. The term Motion, applied to plants, is expressive of the direction of growth in different parts of plants.

The direction of the Motion of the roots and stems is totally opposite; the former either running directly downward into the ground, or horizontally under the surface; and the stems direct their Motion towards the air and light of the sun, mostly in an upright position; but

but many run horizontally along the surface of the earth.

The causes which concur in promoting the Motions of plants, are the moist and warm vapours of the earth to the root, and the air and light of the sun to the stem; for place any number of plants growing in pots, in a room which only admits a small portion of light at one place, the stems will all incline towards that side; in close dark thickets, the young trees always lean to the part where the most light penetrates; and the new shoots of an espalier, or wall-tree, detach themselves from the espalier or wall, in quest of the free air and light.

The force of Motion seems to be greater in roots than in stems; the root, without ever once going out of its way, pierces the hardest soils, penetrates into walls, which it overturns, and even into rocks, which it splits; whereas stems and branches surmount an obstacle, by leaving their natural direction, and over-topping it.

Although the natural direction of most stems or trunks be to ascend, as was before observed, yet some, by their weakness or natural tendency, descend: and sometimes by means of roots breaking out all along the stems and branches, as in strawberry, penny-royal, and many other repent plants, such stems are, by these roots striking into the earth, tethered as it were to the ground, and only their extremities can direct their course upwards.

Leaves and flowers also direct their course towards the air, and light of the sun; leaves always turn their upper surface outward to the air and light; very obvious in wall-trees, and that if a branch is over-turned, so that the leaves are turned the contrary way, they will naturally direct their surfaces again gradually upward to the light and air, though this often costs them several days' growth; many flowers also have a particular daily Motion, present their surface directly to the sun, and follow the diurnal course of that luminous body, such as the sun-flower, and most of the compound flowers; in all of which the disk or surface looks towards the east in the morning, the south at noon, and the west at night.

During the heat of the sun, the pinnated or winged leaves, particularly of the papilionaceous tribe, rise vertically upward; the opposite lobes or folioles, which compose these leaves, rise so as they are generally applied close together by their upper surfaces; but in that state of the atmosphere which generally precedes a storm, or during a close, moist,

cloudy air, the lobes of the same sort of leaves extend themselves commonly along the foot-stalk; and after sun-set they incline still lower, and hang vertically down under the foot-stalk, and are applied close together like the leaves of a book, by their lower surfaces; this Linnæus calls the sleep of plants.

Many simple leaves, when the surface is exposed to an ardent sun, become concave above, but gradually recover as the heat declines.

But, of all the Motions of leaves, none is so sudden and rapid as that of the sensitive and humble plants. See MIMOSA.

Another kind of Motion in plants is elasticity, which is resident particularly in some sorts of seed-vessels, such as the yellow balsamine, and spurting cucumber, &c. in which their fruit, when arrived at maturity, burst open like a spring, and dart out their seeds also with elastic force to a considerable distance.

MOULD, or Earth. See EARTH.

MULCH, a sort of strawy dung, somewhat moist, and not rotted, and is useful in gardening, to protect the roots of new-planted choice trees or shrubs from severe frost in winter, and from being dried by the fierce sun or drying winds in spring and summer, before they are well rooted; for both of which purposes, it is spread evenly on the surface of the ground round the stem of the tree, as far as the roots extend, about three or four inches thick; but which may be augmented in winter if the severity of the frost render it necessary.

MULTICAPSULARES, Multicapsular, of many capsules; plants whose seed-vessel is formed of several capsules united in one as it were, such as those of columbine, peony, aconite, larkspur, and the like. See CAPSULA.

MULTIFIDUS, Multifid, cut into many parts, a flower, or calyx of a flower, that is divided into many segments; the term is also applicable to leaves. See FOLIUM.

MULTIFLOROUS, many flowers on one foot-stalk.

MULTIPLICATUS *Flos*, a Multiplied Flower; one whose petals are multiplied in number beyond their natural, or characteristic, or single state, in two, three, or more series; and such kinds are commonly called double flowers.

All Multiplied Flowers, however, are unnatural productions, because the singles of every genus are the original, and the doubles are accidentally produced from the seeds of the singles; for a corolla in its single state, whether of one or several petals, is that proper from which to draw the characters of any

genus; never from doubles, which being only varieties, are not to be depended on; so that among botanists, double flowers are often termed vegetable monsters, and are disregarded; but, on the other hand, double flowers are often the florist's pride, and generally, in most sorts, are esteemed as improved varieties of the respective species, considered as ornamental garden flowers.

But a double flower is properly that whose petal or petals are twice repeated; though, in the common acceptance of the word *double*, all flowers, whether the petals are twice, thrice, or many times repeated in several series, are among florists generally called by the general name of double flowers; in some the petals are often so multiplied as to obliterate the parts of fructification; in which state they come under the denomination of *luxuriant*. See *LUXURIANT FLOWERS*.

Multiplication is less common in flowers naturally of one petal, than those with several; in the former, however, it frequently happens, as in *campanula*, &c. though not full in the highest luxuriance; but the latter are subject to all degrees of luxuriance, from the lowest to the highest, exemplified in *anemone*, *ranunculus*, *marsh-marigold*, &c. See *PLENUS Flos*.

MUSA, Plantain-tree, or *Banana*.

It consists of very tall-growing, tree-like, herbaceous perennials of the Indies, for the hot-house collection, rising each with an upright, tapering, soft stem, fifteen or twenty feet high; adorned at top all around with enormous leaves, one to two or three yards long, and proportionably broad; and from their centre a large fungous flower stalk, terminated by a vast nodding spadix of monopetalous, ringent flowers, protruded from the spatha, succeeded by a great cluster of cucumber-shaped fruit, a single cluster weighing sometimes a dozen to fifteen or twenty pounds, or upwards, which are esculent and of a delicious flavour.

Class and order, *Polygamia Monœcia*.

Characters.] CALYX, male, female, and hermaphrodite flowers on the same spadix, having female-hermaphrodites on the lower part, and male-hermaphrodites above, all in clusters, each bunch having a spatha for a cup, which is deciduous. COROLLA, each floret of the spadix is ringent, forming an upper lip, and a nectarium the lower lip. STAMINA, in the hermaphrodite florets six subulate filaments, five of them in the corolla, the other in the nectarium, and is double the length of the others, and terminated by a linear anthera, the rest have none; but in the males

are equal in the length, and have all antheræ. PISTILLUM, a large, long, triquetrous germen below the receptacle, a cylindric erect style, and capitated roundish stigma, but no stigma in the males. PERICARPIMUM, in the females a very long, fleshy, obsoletely-triquetrous, trilocular, baccaceous fruit.

The plants of this genus have stems so soft and porous as not to deserve the name of trees, only in stature, especially as they are perennial only in root, the stems dying down to the ground annually in their native soil, after having borne their crop of fruit; they are naturally so quick in growth, as to shoot from the bottom to fifteen or twenty feet height, flower, and produce ripe fruit, all in the space of nine or ten months: the stem is about half a foot thick, and of so soft a nature, as it may be easily cut down at one stroke.

The species are,

1. *MUSA paradisiaca*.

Tree of Paradise, or Common Plantain-tree.]

Hath a strong, fibry, very spreading root; an herbaceous, upright, taper stem, rising fifteen or twenty feet high; terminated by a cluster of very large leaves, about two yards long, and half a one broad; and a large, long, nodding spadix of whitish-yellow polygamous flowers, having the males persistent; succeeded in the others by an exceeding large cluster of long, narrow, yellowish, delicious fruit.

Some authors have supposed this tree, from the prodigious size of its leaves, to be that alluded to, whose leaves our first parents used for clothing in paradise; and also that the fruit is the forbidden apple; however, as to these intimations, we can only say that the sacred text, indeed, calls the leaves employed for this purpose, fig leaves; but the fruit of this is also often by the most ancient authors called a fig; its nature and taste also resembles that fruit; and its leaves, by reason of their great size and substance, were much more proper for a veil or covering than those of any species of *figus*, which are seldom more than eight or ten inches long, and five or six broad, whereas those of the species of this genus, *Musa*, being two or three yards long, with proportionable breadth, could not fail of being pitched upon in preference to all others, especially as they might be easily sewed together with the numerous thread-like filaments that may with the utmost facility be peeled from the stem of the tree.

2. *MUSA sapientium*.

Spotted Musa, or Banana-tree.] Rises with an upright, herbaceous, spotted stem, twelve or fifteen feet high; terminated by a cluster of

of leaves near two yards long, and half a one broad; a large nodding spadix of flowers, having the males deciduous; and large clusters of short, oblong, very luscious fruit.

These curious exotics thrive freely here in our stoves, flower and produce their enormous bunches of fruit in tolerable perfection; but as the plants grow very tall, and the leaves so exceeding large, they require very capacious stove-room, both in width and height: they must be potted in large pots of rich mould, and plunged constantly in the bark-bed, watering them plentifully in summer three or four times a week, and about twice in winter.

The propagation is by suckers arising from the root, particularly after having fruited, which may be taken off at any time in summer, with fibres to their bottom, planted in pots, and plunged in the bark-bed, and they will readily grow; observing, according as their roots advance in growth, to shift them into larger pots.

MUSCI, Mosses, a tribe or family of imperfect plants, which constitute the second order of the twenty-fourth class, *Cryptogamia*. See CLASSIS.

The plants of this order are for the most part so exceedingly minute, that their fructifications are either entirely concealed, or, from their minuteness or situation, are imperfectly visible. There are of this order not less than thirteen genera, each of which comprehends many species, and are mostly very diminutive and creeping; with exceedingly weak stems, creeping and rooting as they extend, closely set with small close-fitting leaves; and extend themselves in a tufted manner, forming a sort of carpet on the ground, trees, and stones; the smallest seldom exceed the third of an inch in height, and the largest not above five or six; mostly perennial and ever-green, delight chiefly in moist shady situations, and are remarkably slow of growth; the flowers so very small that their fructifications have not by the finest glasses been yet perfectly discovered, so as to distinguish their sex; though supposed to be universally male and female distinct; sometimes they sit close to the branches, and sometimes elevated upon long slender foot-stalks, and are succeeded by seed, by which they propagate themselves.

Though, from the exceeding minuteness of these plants, it was formerly supposed they were only excrescences produced from the earth, trees, &c. but they are no less proper plants than those of greater magnitude, though imperfectly visible in some of their essential parts; for many insects are so small that they are

hardly visible, much less so must be their eyes, mouth, &c. yet they possess all the perfect parts of life; so it is of the order of plants under consideration, being possessed of proper flowers and seed.

The supposed male flowers consist entirely of the antheræ and their covering, a sort of very small cawl-shaped *calyptra*, suspended over the tops of the stamina, like an extinguisher.

The supposed female flowers are generally formed into a very small cone, composed of numerous scales, each said to contain in its wing a single seed, as fine as the smallest dust.

None of these plants are ever cultivated, so only mention them for their singularity, and as constituting the second order of the remarkable class *Cryptogamia*.

Some of the Mosses grow in great plenty upon trees, particularly fruit-trees growing close in orchards, especially on cold, moist, barren soils, and frequently prove very injurious to such trees; the only remedy is to cut down some of the trees, or their larger branches, to admit the sun and air, and then thin the remainder; and in winter, with an instrument of iron hollowed on the edge to fit the branches, scrape off the roughest of the Moss; and by two or three repetitions it will be destroyed, but more effectually if the ground between the trees is also ploughed or digged a due depth, to give vigour to the roots, that the trees may assume a free growth at top.

Most of the plants of this numerous tribe have the singular property, after being preserved dry several years, that being moistened they will resume their original verdure.

Some of these plants have a wonderful efficacy in preserving dry such bodies as are susceptible of moisture, and retaining for a long time the humidity of young plants out of ground; for which reason tender young plants or cuttings, &c. as are to be sent to any distance, if wrapped up in some sorts of large moss, it will greatly preserve their vegetative faculty.

MYRICA, Candleberry Myrtle.

The plants are of the shrub kind, consisting of hardy deciduous shrubs for the pleasure-garden, and ever-greens for the green-house; all of which rising with shrubby, branching stems, from about three to five feet high; garnished with oblong, simple, entire leaves; and dioecious, apetalous flowers in aments, succeeded by clusters of small berries, which, in some of the species, afford a sort of green wax, with which candles are made; hence the name of Candleberry Myrtle.

Class and order, *Diaecia Tetrandria*.

Charac-

Characters.] CALYX, male and female flowers on separate plants, in oblong, oval amentums, imbricated on all sides, formed of many small, concave, moon-shaped scales, serving as calyxes, each containing one flower. COROLLA, no petals. STAMINA, in the males four, and sometimes six filaments, and great didymous antheræ, with the lobes bifid. PISTILLUM, in the females an oval germen, two styles, and simple stigmas. PERICARPUM, an unilocular berry, having one seed.

There are four species in the English gardens, two of them hardy and deciduous, and the others tender and ever-green.

Hardy Deciduous Kinds.

1. MYRICA *cerifera*.

Wax-bearing Myrica, commonly called Candleberry Myrtle.] Hath an upright shrubby stem, branching five or six feet high, with yellowish-brown branches; lanceolate, slightly serrated, shining green leaves, three inches long, and one broad, placed irregularly on very short foot-stalks; and diœcious, ammentaceous, small, whitish flowers at the sides of the branches; succeeded in the female plants by clusters of small blue berries, replete with a sort of green waxy matter.

Variety.] Dwarf Carolina Candleberry Myrtle with broad leaves.

They are natives of North America, but have been long residents of our gardens; and both the varieties are choice furniture for the shrubbery; whilst young they often retain their leaves like an ever-green great part of winter; but when older they constantly shed their leaves in autumn: the leaves of both sorts possess a very agreeable fragrance of an aromatic nature, like a Myrtle.

It is from this species the North Americans procure the wax for candles, before mentioned.

2. MYRICA *Gale*.

(Gale)—*Sweet Willow, or Dutch Myrtle.*] Hath under-shrubby, upright stems, branching three or four feet high; lanceolate, slightly-serrated leaves, an inch and a half long, on very short foot-stalks; and diœcious, ammentaceous, small, whitish flowers, succeeded in the female plants by clusters of small berries.

This grows naturally on some boggy grounds both in England and other northern parts of Europe: it is cultivated as furniture for the shrubbery, but must have a moist situation.

Ever-green Kinds for the Green-house.

3. MYRICA *quercifolia*.

Oak-leaved African Myrica.] Hath a shrubby stem, branching three or four feet high; oblong, oppositely-sinuated, close-sitting, smooth

leaves, an inch and a half long, and half as broad; and whitish-green flowers, in oval amentums, succeeded by small round berries.

Variety.] With hairy leaves.

4. MYRICA *cordifolia*.

Heart-leaved Ethiopian Myrica.] Hath a shrubby, slender stem, branching four or five feet high; heart-shaped, serrated, close-sitting leaves; and roundish amentums of flowers, succeeded in the female plants by small berries.

All these shrubs flower in June and July, which in the first and second sorts are succeeded by berries in our gardens; but in the others rarely any in England; neither flowers nor fruit are ornamental; so that the merit of the shrubs consists in the variety and aromatic fragrance of their leaves, and for which they demand admittance in every good collection.

Their Propagation.

Their propagation is by seed, layers, and suckers.

By Seed.—The seed are procured from the places where the respective species grow naturally. Sow them as soon as they can be procured, in pots or boxes of rich earth, half an inch deep, and at the approach of hot weather move them to shade, to remain all summer: they sometimes come up the same year, if sown early, otherwise often not till the second; however in winter remove the hardy kinds under a warm hedge, and the others in garden-frames to have shelter of the glasses in bad weather, and they will all come up the second spring; giving water all summer, shelter again in winter, and in spring plant them out, the hardy sorts in nursery rows to remain two or three years till proper for the shrubbery; and plant the tender sorts in pots, to be placed among the green-house plants.

By Layers.—Choose for this operation the young wood, which lay by slit-laying in autumn; and during the following summer water them plentifully in dry weather, and they will be tolerably rooted by the autumn following; but if not, let them remain another year, to effect it properly; then transplant the hardy sorts in nursery-rows, to remain till fit for the shrubbery; and the tender kinds plant in pots, to manage as green-house plants.

By Suckers.—The hardy sorts sometimes send up a few suckers, which in autumn may be taken up with roots, and planted out in the nursery for a year or two.

Cuttings of all the sorts may also be tried, though not to be depended on: choose the quite young shoots; and if some are planted in pots plunged in a hot-bed and covered close with a hand-glass, some of them may probably take root.

MYRSINE, *African Box-tree*.

A genus, consisting of an ever-green, exotic shrub for the green-house, garnished with oval box-like leaves, and pentandrious flowers.

Class and order, *Pentandria Monogynia*.

Characters.] **CALYX**, a small, five-parted, connivent cup. **COROLLA**, monopetalous, the border half-cut into five semi-ovate segments. **STAMINA**, five very small filaments, topped with erect subulate antheræ. **PISTILLUM**, a subglobose germen, almost filling the corolla, with a cylindraceous style, crowned with a large woolly stigma, hanging beyond the flower. **PERICARPIUM**, a roundish, depressed, one-celled berry, with a subglobose seed obliquely fixed to the bottom of the berry.

The species is,

MYRSINE africana.

African box-leaved Myrsine.] Rises with a shrubby branching stem, four or five feet high, garnished with small, oval, serrated-leaves, placed alternate, and thickly set on the branches; the flowers are of a dark purple, come out towards the ends of the branches in clusters, and are succeeded by roundish berries, which become of a blue-purple colour when ripe.

This plant makes a pretty appearance, but must always be kept in pots of good earth in order for having shelter in winter, and managed as others of the shrubby green-house kinds.

The propagation is by sowing the seeds in spring on a hot-bed; and when the plants are fit to transplant, plant them singly into small pots, observing to shade and water them as may appear wanting; and in September they may be removed into the green-house for the winter; they may also be raised by cuttings of the young shoots in summer.

MYRTUS, Myrtle-tree.

This celebrated plant of antiquity comprises many elegant varieties of the shrub kind, for our green-house collections, and some beautiful species for the hot-house, all delightful ever-greens of great fragrance; rising with branchy stems three to eight or ten feet high, in their native soil; closely garnished with simple entire leaves, and quinquepetalous, hermaphrodite flowers from the sides of the branches, succeeded by oval berries.

Class and order, *Icosandria Monogynia*.

Characters.] **CALYX** is monophyllous, five-parted, placed on the germen, and permanent. **COROLLA** is quinquepetalous, the petals oval, and inserted into the calyx. **STAMINA**, twenty or more capillary filaments inserted into the calyx, and very small antheræ. **PISTILLUM**, a germen under the corolla,

slender style, and obtuse stigma. **PERICARPIUM**, an oval, umbilicated, trilocular berry, each cell having one kidney-shaped seed.

To this genus Linnæus adds the *Pimento*, or all-spice, a beautiful ever-green aromatic, and hot-house plant.

There are about four species of this genus retained in the English gardens; one is the common Myrtle, a very comprehensive species, being the parent of all those different varieties of Myrtle found in our green-house collections: the other three species are for the stove.

Green-house Kinds.

One species only is for the green-house, the common Myrtle, but which, as before observed, affords many varieties.

The species are,

1. *MYRTUS communis*.

Common Myrtle-tree.] Rises with a shrubby, upright, firm stem, branching numerously all around into a close full head, rising from three to ten feet high; closely garnished with oval-lanceolate, entire, mostly opposite leaves, from half an inch to an inch and a half long, and one broad, on short foot-stalks; and numerous small, pale flowers from the axillas, singly on each foot-stalk, having diphyllous involucrum; each flower succeeded by a small, oval, dark-purple berry.

The most material varieties are,

Broad-leaved Roman Myrtle.—Hath oval, shining, green leaves, an inch and a half long and one broad, and is remarkably floriferous.

Gold-striped broad-leaved Roman Myrtle.

Broad-leaved Dutch Myrtle.—Hath spear-shaped, sharp-pointed, dark-green leaves, an inch long, and about three quarters of one broad.

Double-flowered Dutch Myrtle.

Broad-leaved Jews' Myrtle.—Having the leaves placed by threes at each joint; by which particular circumstance this species is in universal estimation among the Jews in their religious ceremonies, particularly in decorating their tabernacles, and for which purpose many gardeners about London cultivate this variety with particular care, to sell to the above people, who are often obliged to purchase it at the rate of six-pence or a shilling for a small branch; for the true sort having the leaves exactly by threes, is very scarce, and is a curiosity; but by care in its propagation, taking only the perfectly ternate-leaved shoots for cuttings, it may be increased fast enough, and is worth the attention of the curious, and particularly those who raise Myrtles for the London markets.

Orange-

Orange leaved Spanish Myrtle.] Has oval, spear-shaped leaves, an inch and a half long or more, and one broad, in clusters round the branches, and resembling the shape and colour of orange-tree leaves.

Gold-striped-leaved orange Myrtle.

Common Upright Italian Myrtle.] Hath its branches and leaves growing more erect, the leaves oval, lanceolate-shaped, acute-pointed, and near an inch long, and half a one broad.

Silver-striped upright Italian Myrtle.

Gold-striped upright Myrtle.

Ruscus-leaved upright Myrtle.

White-berried upright Italian Myrtle.

Portugal Acute-leaved Myrtle.] Has spear-shaped, oval, acute-pointed leaves, about an inch long.

Box-leaved Myrtle.] Hath weak branches, small, oval, obtuse, lucid-green, closely-placed leaves.

Striped box-leaved Myrtle.

Rosemary-leaved Myrtle.] Hath erect branches, small, narrow, lanceolate, acute-pointed, shining-green, very fragrant leaves.

Silver-striped rosemary-leaved Myrtle.

Thyme-leaved Myrtle.] Hath very small closely-placed leaves.

Nutmeg Myrtle.] Hath erect branches and leaves; the leaves oval, acute-pointed, and finely-scented like a nutmeg.

Broad-leaved Nutmeg Myrtle.] Silver-striped-leaved—Blotched-leaved.

Cristated, or Cock's-comb Myrtle, frequently called Bird's-nest Myrtle.] Hath narrow, sharp-pointed leaves, cristated or tufted at intervals.

These are the principal varieties of the *Myrtus communis*; but of which sorts there are several intermediate varieties of less note; and more may still be obtained from seed, though the plants are rarely raised from seed in England, but mostly by slips and cuttings.

They are all beautiful ever-green shrubs of exceeding fragrance; exotics originally of the southern parts of Europe, and of Asia and Africa, and consequently in this country require shelter of a green-house in winter: all of which, though rather of the small-leaved kind, have their foliage closely placed, and remain all the year, and several of them are very floriferous in summer; and when there is a collection of the different sorts, they afford an agreeable source of variety with each other; they therefore claim general esteem as principal green-house plants, especially as they are all so easily raised from cuttings, and of such easy culture, as to be attainable in every garden where there is any sort of green-

house, or garden-frames furnished with glasses for protecting them in winter from frost: but some of the broad-leaved sorts are so hardy as to succeed in the full ground, against a south-wall and other warm exposures all the year, by only allowing them shelter of mats occasionally in severe frosty weather: so that a few of these sorts may be also exhibited in a warm situation in the shrubbery: observing, however, all the sorts are principally to be considered as green-house plants, and a due portion of them must always remain in pots to move to that department in winter. See their *Propagation and General Culture.*

Stove Kinds.

There are several species of the stove temperature, as being natives of the Indies; but there are not more than three or four of the following sorts commonly met with in the English gardens; all of which are beautiful ever-greens, with larger leaves than the *Myrtus communis*, and are mostly strong aromatics.

2. *MYRTUS zelanica.*

Ceylon White-berried Myrtle.] Hath a shrubby upright stem, branching erectly six or eight feet high; oval, shining-green, opposite, very odoriferous leaves, on short foot-stalks; and all the branches terminated by pedunculi, each sustaining many fragrant flowers, succeeded by snowy-white berries, but rarely in England.

3. *MYRTUS Pimento.*

Pimento, or Jamaica All-spice-tree.] Rises with an upright tree-stem, branching regularly, twenty or thirty feet high, having a smooth brown bark; large, oblong-oval, pointed, stiff, shining, very odoriferous leaves, like those of bay, placed alternate; and at the sides and termination of the branches large loose bunches of greenish flowers, succeeded by round, dusky, hard, spicy fruit, called all-spice, or Jamaica pepper.

Variety.] Pimento with oval obtuse leaves.

This species is wholly an admirable fine aromatic, its leaves are remarkably fine scented; and its fruit is that valuable spice, Jamaica pepper, or all-spice, so called because it is supposed to partake of the odour and taste of most other spices. The tree grows in great abundance in the island of Jamaica, where its fruit is made a considerable branch of trade; is generally gathered a little before it acquires full growth, and dried in the sun ten or twelve days, is then packed up ready for exportation to Europe.

4. *MYRTUS tomentosa.*

Woolly-leaved Chinese Myrtle.] Rises with a tree-like stem, having a lightish bark; the leaves are large, oval, triple-nerved, and underneath

derneath downy; the flowers, which are of a beautiful red, come out on peduncles, one, two, or three together.

This shrub, both in respect to its foliage and flowers, bears but little similitude to the common myrtle; it is exceedingly beautiful, and if suffered to grow up, will acquire the height of many feet. Its blossoms are larger than those of the common myrtle; they are produced in June and July.

5. *MYRTUS diæca*.

Diæcous American Myrtle.] Rises with an upright tree-stem, branching many feet high; oblong, thick, opposite, odoriferous leaves; and at the axillas and ends of the branches pedunculi dividing into trichotomous panicles of flowers, succeeded by small, globular, spicy berries.

Every part of the tree is a strong aromatic.

6. *MYRTUS lucida*.

Shining-leaved Surinam Myrtle.] With oblong sessile leaves, diminishing and lanceolate at the apex; and peduncles having mostly three flowers.

7. *MYRTUS caryophyllata*.

Clove-scented Ceylon Myrtle.] With obovate, opposite leaves, and peduncles trifid multiflorous.

8. *MYRTUS brasiliæna*.

Brazilian ciliated Myrtle.] Rises with a branching stem, having a whitish bark; broad, oval, shining, opposite leaves, and naked peduncles sustaining solitary flowers, with ciliated petals.

General Observations.

All these species of *Myrtus* are exotics of the shrub and tree kind, though in this country, as being confined in pots, the largest of them assume only the growth of moderate shrubs. The first species, Common Myrtle, is considerably the most noted species of this genus in this country, where, in most of our green-house collections, one or other of the varieties is found in tolerable plenty; but all the varieties of it highly merit notice. The other four species are rare in England; they however are retained in many curious gardens, in the stove collection, more particularly the *Pimento*, which is a very beautiful odoriferous ever-green, and exhibits a fine variety in the stove at all seasons: in short, all the species, both green-house and stove kinds, have a pretty effect as ever-greens, and some of the sorts flower very ornamentally, particularly of the Common Myrtle.

With respect to flowering, all the varieties of the *Myrtus Communis* flower here in July and August, most of which are very floriferous, but more particularly the broad-leaved

Roman kind, which is often covered with flowers; and in some of the sorts they are succeeded here by berries ripening in winter. Some of the stove kinds also flower here, but are rarely succeeded by fruit in England.

The flowers, however, of most of the sorts are small, but numerous, and are all formed each of five oval petals, and many stamina. See the *Characters*.

As all the species require occasional shelter here, they must be kept always in pots, for moving to the proper places of shelter, according to their nature; the *Myrtus Communis* and varieties to the green-house in winter; the others to the stove, to remain all the year: therefore let all the sorts be potted in light rich earth, and, as they advance in growth, shift them into larger pots, managing the Myrtles as other green-house shrubs, and the stove-kinds as other woody exotics of the stove. See their *Propagation and General Culture*; also GREEN-HOUSE and STOVE PLANTS.

But, as we before observed, the broad-leaved *Myrtus communis* being hardier than the smaller-leaved kinds, some of them may also be turned out into the full ground in a warm situation against a south wall, &c. allowing them shelter of mats in frosty weather, and mulch the ground over their roots: they will frequently succeed tolerably, and effect a good variety in such places.

Propagation and General Culture.

The propagation of the *Myrtus communis* and varieties is effected abundantly by slips or cuttings, also by layers; but as the former strike freely, it is the most eligible method for raising any considerable quantity, as also the handsomest plants, which may be struck either in natural earth, or more effectually by aid of hot-beds, to bring them forward.

By Slips and Cuttings.—The young shoots, either of the same or former year's growth, of from about two or three to five or six inches long, are the proper parts for planting; but more freely in the same year's shoots; and, as above said, may be struck either in natural earth without artificial heat, or by aid of hot-beds; but by the latter you may greatly facilitate the rooting and first effort of growth. By either method the work may be performed any time from March or April until August, though June or July is the most common season, especially when intended to use the shoots of the year, which are generally in prime order in July, and often strike freely the same year without aid of hot-beds; the young shoots of the former year will also often strike tolerably, especially if planted in spring or early in summer;

mer; or by aid of hot-beds may be made to strike root readily at any time in the spring or summer season. By aid of a hot-bed, however, all the sorts, both of one or two years shoots, may be greatly facilitated in rooting; a dung hot-bed under common frames and lights will do, though a bark hot-bed of a stove, &c. is considerably the most eligible and effectual, and may be readily used any time in spring and summer for this purpose; and by which assistance vast numbers of cuttings may be struck with the utmost facility in a short time, with but little trouble; and plants thus struck in spring or early in summer, may be so much forwarded as to form pretty little plants the same year, and be fit to pot off separately early in autumn. We will, however, exhibit separate directions for both methods, i. e. striking them in natural earth, and by hot-beds.

First, by striking them in natural earth.—We noticed above, that the planting might be performed any time from March till August; observe in respect to this, that if you would begin in spring, or early in summer, you must choose principally the shoots of the former year; and if you do not begin planting till June or July, but particularly the latter month, the young shoots of the year will be arrived at a proper growth, and will root freely. Observe, in choosing the shoots either of the former or same year, to choose the straight clean growth, of from about two or three to four or five inches length, and as robust as possible; which divest of the lower leaves, two parts of three of their length; they are then ready for planting; then having some large wide garden-pots, or flat wide earthen pans, six or eight inches deep, with holes at bottom to discharge the superabundant moisture after watering, fill the pots or pans with light rich mould, in which plant the slips or cuttings, many in each pot or pan, if required, inserting the small cuttings within an inch of their tops, and about an inch or two asunder; give directly some water to settle the earth closely about each plant; then either plunge the pots, &c. in a shallow garden-frame, and put on the glasses, or under oiled paper-frames, or cover each pot or pan close with a low hand-glass, which is rather the most eligible for facilitating their rooting; in either method, however, observe to plunge the pots in the earth, and keep them close covered with the glasses, &c. where practicable, to exclude the air; for this will promote the quick emission of roots the same season; remembering to afford them occasional shade from the mid-day sun; but if under oiled paper, none is wanted; and give

plenty of water three or four times a week at least, or oftener in very hot weather; thus they will sometimes be rooted in a month or six weeks, which will appear by their showing signs of growth at top; or sometimes they do not root freely till the following spring; observing, when rooted, showing signs of growth, to inure them gradually to the full air, still supplying them duly with water during the hot weather, whereby they will shoot in height; and those planted early will often branch out laterally a little the same year, so as to commence pretty little plants by autumn: let them remain in the full air until October, then remove them in their pots or pans into the greenhouse, or under a good garden-frame, &c. for the winter, and in spring the forwardest in growth may be potted off separately in small pots; but if rather small and weak, or but indifferently rooted, let them have another summer's growth, and pot them out separately in September or spring following, as it shall seem proper, managing them as other greenhouse shrubs of similar temperature, and shift them into larger pots occasionally, according as they shall require.

For want of frames and glasses of any sort to strike the cuttings under, oiled paper-frames may be used, which may be obtained at an easy expense, and are excellent for striking many sorts of cuttings; they admit the rays of light and heat sufficiently, at the same time afford such an agreeable shade from the sun that no other is required, and which is of such a nature as greatly to promote the rooting of cuttings.

But Myrtle cuttings, shoots of the year, will sometimes strike in the open ground; and if planted betimes in summer, either in pots or pans, as above mentioned, and plunged in a shady border, or the slips planted in the earth of such a border of rich earth, and in either method plentifully supplied with moisture, they will often, in many of them, root tolerably the same year, and shoot a little at top; though rarely so effectual, or make so good plants by autumn as those forwarded in the above manner, nor near so strong as those struck in the following method by aid of artificial heat.

By aid of Hot-beds.—By the assistance of hot-beds, either that of dung, under frames and glasses, oiled paper-frames, or in the bark-bed, in the stove, &c. but rather the latter; but by either method the rooting and first growth of the slips may be greatly forwarded; a bark-bed in particular in the stove, &c. is the most eligible and effectual for this purpose; and in which vast numbers of slips or cuttings may be readily struck, at any time from

from March until August, both in shoots of the former year, and of the same year's growth, from three or four to five or six inches long; and that those struck in spring and early in summer, will form fine young plants for potting off early in the proceeding autumn. However, in default of bark hot-beds, one of dung under glasses may be used successfully; but if furnished with both, give preference considerably to a bark-bed.

Therefore being furnished with pots, or rather wide pans, as before directed, filled with fine rich earth, take off a quantity of slips or cuttings, the most robust shoots; which if in spring or early in summer, those of the former year must be chosen; and at a more advanced season, those of the same year will be arrived to a proper growth for this purpose: observing, for either sort, to strip off the under leaves, as before advised; then plant them in the pots or pans, as already exhibited, give a general watering, and directly plunge them in the hot-bed, affording occasional slight shade from the fierce sun, and water them frequently; they will thus root in a fortnight or three weeks, and advance in growth; observing to inure them gradually to the open air, if the temperature of the weather permits, in a sheltered situation; or in a frame, if cold weather, and from thence by degrees expose them fully for the remainder of the summer, in a sheltered place, and supply them duly with water in dry weather; they will be fine plants by September; and, as before observed, those raised early will be then fit to pot off singly into small pots; and the latter plantings will be fit for potting in spring or autumn following; removing them all to shelter towards the middle or latter end of October.

In striking the cuttings by the above method, if, as soon as they are planted and plunged in the hot-bed, each pot or pan is covered close with a low hand-glass, it will still contribute to facilitate their rooting the more effectually; for being close covered, it will force out roots sooner, and prevent the cuttings from running up weak; observing, however, when they begin to advance at top, to remove the glasses.

By the above methods of artificial heat, in striking Myrtle cuttings, you may make two or three plantings each season, where large quantities are required; the first planting in March or April, of the best last year's shoots; the second early in June, of the succeeding best shoots; or about Midsummer, or soon after, may plant shoots of the year; and in a month or six weeks after, the next best shoots

also of the same year will be come forward, and of which may be made another plantation; plunging each planting in the bark-bed, &c. as above; thus may you have three young successions advancing in different stages of growth each year in store-pans; some ready for potting off singly every autumn and spring, whereby a large stock may be always kept up, as is more particularly necessary for those who raise them for sale, especially about London, for Covent-garden market, where amazing quantities are brought for sale in spring and summer.

Those who propagate large quantities of these plants annually, should always keep some strong bushy plants for furnishing slips or cuttings for this purpose.

Propagation by Layers.—Such plants as are furnished with young bottom branches or shoots situated low enough for laying, may be layed in spring, in the usual way; every shoot will readily emit roots, and be fit to transplant into separate pots in autumn.

By Seed.—This may be sown in spring, in pots of light mould, and plunged in a moderate hot-bed; the plants will soon come up, which when two or three inches high, pot them off separately in small pots; manage them as the others, and probably as they advance in growth may discover some new varieties.

General Culture.

With respect to the general culture of all these sorts of common Myrtle, they succeed in the open air from May until the middle or towards the latter end of October, when remove them in their pots to the green-house; or, in default of sufficient green-house room, some of a low or moderate growth may be placed into a deep garden-frame under glasses, allowing air freely in all mild weather, by opening the glasses wide; giving also moderate watering, in similar temperate weather, during winter, &c. about once a week or ten days, and every other day at least in summer; and according as they advance in growth, shift them into larger pots; which may be necessary every year to one or other of them. See GREEN-HOUSE PLANTS.

In training these shrubs, observe, that, as they naturally branch out all around, often feathered quite to the bottom, in a beautiful manner, if you design any shall form standards with bushy heads for variety, trim off the lower shoots gradually so as to form a straight clean stem, one, two, or three feet high, then suffer them to branch out every way at top to form a head: but those which are intended to be low and branchy quite to the bottom, should have the lateral shoots en-

M Y R

couraged nearly in their own way, whereby they will be feathered all the way from bottom to top, and assume a more picturesque appearance.

Let them afterwards for the most part assume their own natural growth, except occasionally pruning any long rambling shoots; or when their heads become thin, straggling, and irregular, to shorten with a knife such shoots as shall appear proper, either in order to force out laterals to make good deficiencies, or to form regularity.

Never practise clipping these shrubs with garden-shears into globes, pyramids, &c. as sometimes done; but let all necessary trimming be performed by knife, and that only in cases of irregularity as above; for they always appear the most agreeable when they grow nearly according to nature.

If the heads of any of these plants at any time become very irregular, or thin and stubby, they may be renewed by heading down all the branches pretty short in spring, and shifting them into larger pots of fresh mould, with the ball of earth about their roots, affording plenty of water all summer, and they will all branch out again numerously, and form handsome full heads by the succeeding autumn.

Sometimes when Myrtles are become very weak straggling shooters, with naked unsightly heads, if headed down, as above, in April or May, turned out of the pots, and plunged in a warm border of rich soil, giving plenty of water, they, by sending their fibres into the fresh earth, often break out with fresh vigour, and become fine full-headed plants by the end of summer, when they may be taken up with balls to their roots, and potted in fresh earth.

As the sorts in general increase in size, shift them into larger pots. See GREEN-HOUSE PLANTS, and SHIFTING PLANTS.

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Propagation of the Stove Kinds.

The tenderer kinds of *Myrtus* for the stove are commonly propagated by seeds; though, when any are pretty branchy, it may also be tried by layers and cuttings.

By Seed.—This is procured from abroad by the dealers, preserved in sand, &c. and arrives in spring, which sow as soon after as possible, in pots of fresh rich mould, and plunge them in a bark-bed; the plants will come up the same season; which, when of two or three inches height, plant out in separate small pots, plunge them also in the bark-bed, supply them with water, and manage them as other woody plants of similar temperament.

By Layers.—The first sort in particular often branch out low; lay some of the young shoots in spring, by slit-laying or wiring, &c. plunging the pots in which they are layed in the tan-bed; they will probably be rooted in one year, though it is sometimes two before they strike good root, when pot them off separately.

By Cuttings.—In May or June cut off some short young shoots from such of the plants as afford them, plant them in pots of fresh compost, plunge them in the bark-bed, and cover them close with a low hand-glass, giving due refreshments of water; they will mostly take good root the same year, and be fit to plant in separate small pots.

In the general management of these sorts, keep them always in the stove, except about a month in the heat of summer, when they may be trusted abroad. Let them shoot nearly in their own way, keeping them, however, to upright stems, and suffer their heads to branch out according to nature, except just reducing very irregular shoots: give frequent waterings in common with other woody plants of the stove department, and shift them occasionally into larger pots. See STOVE PLANTS.

N.

N A P

NAPÆA, Virginia Mallow.
A genus of hardy, herbaceous, flowery, perennial plants of tall upright growth, garnished with lobate and palmate leaves, and the

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upper part with tubulous, pentapetalous, diœcious, white flowers.

Class and order, *Diœcia Monadelphia*.

Characters.] CALYX, an angulated cup, cut

cut into five segments. **COROLLA**, five oblong petals, joining below the tube of the filaments. **STAMINA**, many monadelphous filaments, coalescing at their base, and topped with roundish antheræ. **PISTILLUM**, an orbicular germen, with five or more styles, crowned with headed stigmata. **PERICARPIUM**, a roundish, depressed capsule, with ten cells containing solitary seeds.

The species are,

1. *NAPÆA lævis*.

Smooth Napæa.] Hath many thick, fleshy, creeping roots; the stalks rise to about four feet high, garnished with smooth lobate leaves placed alternately: from the base of the leaves comes out the flower foot-stalk, supporting three white flowers.

2. *NAPÆA scabra*.

Rough Napæa.] Hath many thick roots which strike deep in the ground and joining at top in large heads; the stalks rise seven or eight feet high, and divided into several lesser branches; these are garnished with rough palmate leaves, deeply cut into six or seven lobes; from the upper part of the stems, comes out from each joint a long foot-stalk, sustaining several tubulous white flowers divided above into five spreading segments or petals.

These plants are hardy, natives of North America: the first species is propagated by its creeping roots, which may be parted in autumn. The second is increased by sowing the seeds in the common ground in spring, and the young plants arising may be transplanted in autumn, where they are to remain.

NARCISSUS (*Narcissus*) Daffodil.

This genus consists of a numerous family of eminent, bulbous-rooted, herbaceous perennials of the flowery race, for embellishing the pleasure-garden, having all large tunicated, bulbous roots, crowned with several long narrow leaves, and erect naked flower-stalks, rising from about eight or ten to fifteen or eighteen inches high, each terminated by a spathe, protruding one or more large hexapetalous, liliaceous flowers, having a large cup-shaped nectarium in the centre.

Class and order, *Hexandria Monogynia*.

Characters.] **CALYX** is an oblong, compressed spathe, opening on one side, and withering. **COROLLA**, six large, oval petals, externally inserted into, and surrounding a large cup-shaped nectarium; the nectarium is monopetalous, and placed directly in the centre of the corolla, and resembles a sort of cup or dish. **STAMINA**, six short awl-shaped filaments affixed to the tube of the nectarium, and oblong antheræ. **PISTILLUM**, a roundish three-cornered germen below the corolla,

long slender style, and trifid stigma. **PERICARPIUM**, a roundish, obtuse-trigonous, trilocular, trivalvular capsule, having numerous roundish seeds.

To this celebrated genus belong also all the sorts of *Jonquilla*, or Jonquil.

There are about twelve species, some of them furnishing a numerous train of beautiful varieties; one of the species, Common Daffodil, grows wild in England, &c. but it nevertheless possesses merit as a garden-flower: most of the others are originally of foreign growth, but are hardy enough to prosper in our flower-borders, and several of which have long adorned our gardens. All of them produce their flowers from a spathe or sheath; some having but one, and some many flowers from the same spathe, though the greater part are uniflorous; but the multiflorous kinds, called *Polyanthos Narcissus*, having superior merit, are in most esteem among the florists; but all the sorts are very ornamental flowers.

Each flower of all the species of this genus being furnished with that appendage called *nectarium*, which in these plants is always placed in the centre of the corolla, and as it in shape resembles a sort of cup or little dish, it is, among gardeners and florists, commonly, but rather improperly, called the cup; therefore in the following descriptions of the species, when we occasionally mention the cup, it must always be understood the nectarium.

The species are,

1. *NARCISSUS Pseudo-Narcissus*.

(*Pseudo-narcissus*) — or common *Yellow Daffodil*.] Hath a large, oblong, bulbous root, sending up several long, narrow, light-green leaves, a foot long, and half an inch broad, a little hollow along the middle; amidst them, an upright flower-stalk, twelve or fifteen inches high; terminated by an uniflorous spathe, protruding one large yellow flower, having oval petals, and a bell-shaped, erect, golden middle-cup or nectarium, waved, and equal in length with the corolla; flowering in March and April.

Varieties of this are,] Common single-flowered pale-yellow Daffodil — deep-yellow — golden-cupped — double-flowered — double-yellow with several cups within one another — white with yellow cups — yellow and white — Tradescant's large double — long tubed-flowered — short-tubed — dwarf-stalked.

This species grows wild in great plenty in many of our woods and coppices, and under hedges in several parts of England; from which places, in the counties round London, the herb-folks or simplers bring great quantities

ties in the spring of the year, when in bloom, root and all, and sell them about the streets. Its commonness renders it of but little esteem with many; considered, however, as an early and elegant flower, together with its exceeding hardiness, and easy culture, are sufficient merits to entitle it to a place in every garden.

2. *NARCISSUS bicolor.*

Two-coloured Incomparable Narcissus.] Hath a large, oblong, bulbous root, crowned with long, narrow, dark-green leaves, twelve or fourteen inches long; an upright flower-stalk, about fifteen inches high, terminated by an uniflorous spatha, protruding one large flower with white petals, and a bell-shaped, spreading, golden nectarium, waved on the margin, and equal in length with the corolla; flowering in April.

Varieties.] Common single-flowered—semi-double-flowered—double-flowered—double-flowered, with the interior petals some white, and some yellow—with sulphur-coloured flowers.

3. *NARCISSUS poeticus.*

Poets' Daffodil, or common White Narcissus.] Hath a large bulbous root, crowned with several long, narrow, light-green leaves, a foot in length, and near half an inch broad, a little hollow along the middle; amidst them an upright flower-stalk twelve or fifteen inches high, terminated by an uniflorous spatha, protruding one large, expanded, nodding, pure-white flower, having a short rotated or wheel-shaped nectarium, slightly crenated, and fringed on the border with a purple circle; flowering in May, and is of exceeding fragrance.

Varieties.] With purple-cupped flowers—yellow-cupped flowers—double-flowered: all of them with entire white petals.

This species is the ancient celebrated *Narcissus* of the Greek and Roman poets, which they so greatly extol for its extreme beauty and fragrance.

4. *NARCISSUS Bulbocodium.*

(Bulbocodium) — or Rush-leaved Yellow Daffodil, commonly called Hoop-petticoat Narcissus.] Hath a small bulbous root, crowned with several narrow, subulate, rush-like leaves, six or eight inches long; amidst them a slender, upright flower-stalk, six inches high, terminated by an uniflorous spatha, protruding one yellow flower, having the nectarium top-shaped, much larger than the petals, and very broad and spreading at the brim; flowering in April.

From the large spreading nectarium of this species, which being three or four times longer than the petals, narrow at bottom and

widening gradually to the brim, so as to resemble the shape of some old-fashioned hoop-petticoats, it obtained the name Hoop-petticoat *Narcissus*.

5. *NARCISSUS ferotinus.*

Late-flowering small Autumnal Narcissus.] Hath a small bulbous root, crowned with a few narrow leaves; among them a jointed flower-stalk, eight or nine inches high, terminated by an uniflorous spatha, protruding one white flower, having a short, six-parted, yellow nectarium; flowering in autumn.

6. *NARCISSUS tazetta.*

(Tazetta)—or Multiflorous Daffodil, commonly called Polyanthos-Narcissus.] Hath a very large, roundish, bulbous root; long, narrow, plane leaves; an upright flower-stalk, rising from ten or twelve inches to a foot and a half high; terminated by a multiflorous spatha, protruding many large, spreading, white and yellow flowers in a cluster, having each a bell-shaped nectarium shorter than the corolla; flowering in February, March, and April, and is very fragrant.

The varieties of this are very numerous, consisting of about eight or nine principal sorts, each of which having many intermediate varieties.

Principal Varieties are,] With entire white flowers in large bunches—with white petals and yellow nectarium, or middle cup—white petals and sulphur-coloured nectarium—white petals and orange-coloured nectarium—with entire yellow flowers—yellow petals and orange-coloured cup—yellow petals and sulphur-coloured cup—double-flowered of each of these varieties: all of which are multiflorous, or many flowers in a cluster from each spatha.

Of each of these principal varieties are many intermediate ones, as above observed, varying from each other in some little particulars; amounting in the whole greatly above an hundred in the florists' catalogues, each variety distinguished by a name according to the fancy of the first raiser of it; which varieties, however, and their names, often varying in the course of time, and in different places, it would be unnecessary to attempt the enumerating any other here than the above principal standing varieties: they are all very pretty flowers, and make a charming appearance in the flower-borders, &c. they are also finely adapted for blowing in glasses of water, or in pots, to ornament rooms in winter.

The name *Polyanthos Narcissus*, usually given to this species, signifies Many-flowered *Narcissus*, many flowers growing from the same spatha, in a close head or cluster, like a truss

trufs of the Polyanthos Primrose, which has also the name *Polyanthos*, from many flowers growing in a head. See PRIMULA.

Jonquil Kinds.

There is but one species of the true Jonquil, but which admits of several varieties, all of the multiflorous kind, and very pretty spring-flowers of delightful fragrance, and have long ornamented many curious flower-gardens.

7. *Narcissus Jonquilla.*

(*Jonquilla*)—or *Jonquil*, sometimes called *Rush-leaved Daffodil*.] Hath an oblong, bulbous, brown root, sending up several long, semi-cylindric, subulate, rush-like, bright-green leaves; amidst them an upright green-flower-stalk, a foot or fifteen inches high, terminated by a multiflorous spatha, protruding many yellow flowers, mostly expanded like a radius, each having a hemispherical-bell-shaped, crenated nectarium, shorter than the petals; flowering in April, and generally of a fine fragrance.

Varieties are,] Jonquil minor with single flowers—Jonquil major with single flowers—starry-flowered—yellow and white-flowered—white-flowered—semi-double-flowered—double-flowered—and large double inodorous Jonquil; all of them multiflorous, the singles in particular: but sometimes the doubles produce only two or three flowers from a spatha, and the singles commonly six or eight.

All the sorts of *Jonquilla* have so fine a shape, so soft a colour, and so sweet a scent, that they are some of the most agreeable spring flowers.

Less common Narcissus Kinds.

8. *NARCISSUS calathinus.*

Calathine Multiflorous Yellow Narcissus.] Hath a large bulbous root, crowned with long, narrow, pike leaves; and amidst them an erect, robust flower-stalk, terminated by a multiflorous spatha, protruding many large, entire, yellow flowers, having a bell-shaped, slightly crenated nectarium, equal in length with the petals.

9. *NARCISSUS odorus.*

Sweet-scented Starry Yellow Narcissus.] Hath a bulbous root; narrow leaves; erect flower-stalk, a foot or more high, terminated by a sub-multiflorous spatha, protruding sometimes but one, and sometimes several entirely yellow flowers, having a campanulated, six-parted, smooth nectarium, half the length of the petals.

10. *NARCISSUS triandrus.*

Triandrous, or Three-stamened, reflexed White Narcissus.] Hath a bulbous root; very narrow, rush-like leaves; erect flower-stalk, terminated by an uniflorous spatha, protrud-

ing one reflexed white flower, having a bell-shaped, crenated nectarium, half the length of the petals, and with mostly triandrous or three stamina.

Variety.] With pale-yellow flowers.

11. *NARCISSUS trilobus.*

Trilobate Yellow Narcissus.] Hath a bulbous root; narrow rush-like leaves; and erect flower-stalks, terminated by a sub-multiflorous spatha, protruding sometimes but one or two, and sometimes several yellow flowers, having a bell-shaped, three-lobed nectarium, half the length of the petals.

12. *NARCISSUS minor.*

Minor Yellow Winter Daffodil.] Hath a small bulbous root; plane leaves, eight or ten inches long, and more than half a one broad; an erect flower-stalk, terminated by an uniflorous spatha, protruding one nodding yellow flower, with spear-shaped petals, having an obconic, six-parted, waved nectarium, equal to the length of the corolla; flowering in winter, or very early in spring.

General Description.

All these twelve species of *Narcissus* are of the bulbous-rooted tribe, and universally perennial in root, but annual in leaf and flower-stalk; all of which rise annually in spring, immediately from the crown of the bulb, first the leaves, and in the midst of them the flower-stalk, one only from each root, entirely naked or leafless, each terminated by a spatha or sheath, which opens on one side to protrude the flowers, and then withers; the flowers, as before observed, are all hexapetalous, each furnished with a nectarium in the centre, and are large and conspicuous, appearing mostly in the spring season, generally from March or April until June, succeeded by ripe seed in July; then the leaves and flower-stalks decay, and the roots then desist from growing for some time; at which period of rest is the only proper time to take up or transplant the roots from one place to another, or to separate the off-sets: for they all multiply abundantly by off-set young bulbs from the main root, inso-much that a single bulb will in one or two years be increased into a large cluster of several bulbs, closely placed together, and which every second or third year should be taken up at the above period in order to be separated; and each off-set so separated commences a distinct plant, which being planted again in autumn, produces flowers the following summer, alike in every respect to those of their respective parent bulbs. See BULBUS.

All the species are so hardy that they prosper in any common soil of a garden: observing, however, to allow the finer sorts of *Polyanthos*

Ivanthos-Narcissus in particular, principally a warm dry situation; all the others may be planted any where in the open dry borders and flower-beds.

The first seven species are those the most commonly known in the English gardens; all of which produce ornamental flowers; but the *Polyanthos-Narcissus* is among the florists esteemed the chief of the *Narcissus* tribe, both on account of its mode of flowering, i. e. in a large cluster from each spatha, and from the vast source of variety it affords in the different properties of its flowers; so that almost every eminent florist cultivates this species and its varieties with great assiduity, and are often particularly industrious in raising new varieties from seed, especially the Dutch florists; and when any new variety is so obtained, it propagates itself plentifully by off-sets of the root like the other sorts, whereby the stock in two or three years will be greatly increased.

With respect to the merit of the species in general as flowering plants, all the sorts may be considered as some of the most beautiful of our bulbous-rooted spring flowers for ornamenting the borders, &c. of the pleasure-garden, and have a very fine effect when disposed in patches in assemblage with other bulbous flowers of the spring.

The bulbs or roots of all the sorts may be had at most of the nursery-gardens, and of the seedsmen, at the proper season, i. e. from September until Christmas, or even until spring.

Season and Method of Planting, &c.

The best general season for planting all these bulbs is autumn, from about the beginning or middle of September until November, in which they will flower considerably stronger, as well as furnish a greater increase of off-sets than those planted later, or not till spring: if, however, some roots are retained out of ground until February, they will succeed those of the autumnal planting in flowering, whereby you may vary and prolong the continuance of the bloom; but these late-planted roots always flower weaker, some not at all, and at best with inferior beauty, and shorter continuance, and furnish but a bad increase of roots; therefore always consider autumn as the proper planting season for the principal blow.

In planting them, observe the following modes of disposition:

Those you design to dispose in the open borders or other compartments, in assemblage with other bulbous flowers, &c. I should advise them to be deposited in little patches, of about three or four roots in each, planting

them either with a blunt dibble, or hole them in with a garden trowel, three or four inches deep; in which mode of disposition they will show their flowers more conspicuously and ornamental than if planted singly, as each patch of plants will display their flowers in a cluster, which will strike the eye most agreeably.

When intended to plant a quantity in beds by themselves, in order to exhibit a full bloom all together in one place, as is often practised to the fine *Polyanthos-Narcissus*, Jonquils, &c. have the beds four feet wide, with foot and a half or two-feet-wide alleys between; in which beds plant the roots in rows lengthways, nine inches asunder; planting them either with a blunt-ended dibble, or drill them in with a hoe, three or four inches deep, and six distant in each row, covering them regularly with the earth, and rake the surface smoothly.

Having planted the roots in either of these methods, all the culture they require is to be kept clean from weeds; and they will all flower in due perfection the following spring and summer.

But the *Polyanthos-Narcissus* and Jonquil, as we formerly observed, being of the multiflorous kinds, and considered of superior value and beauty, to blow them in the highest perfection, curious florists bestow particular care in their culture: some prepare beds of compost, as for the fine hyacinths, &c. and manage them in the same manner, particularly the *Polyanthos-Narcissus*: remark, however, that, in default of such prepared composts, &c. you need not be under any great anxiety, for they generally succeed very well in any good, light, rich earth of a garden, in a warm, sunny, sheltered situation, with the beds a little elevated above the common level, out of the reach of copious moisture in winter; so having the ground formed into four-feet-wide beds, in which plant the roots in rows nine inches asunder, as before directed; and in winter and early in spring give occasional shelter of mats from cutting frosts and other inclement weather, especially after the flower-buds appear above ground.

All the sorts of these bulbs, planted in either of the above methods, may be suffered to remain in the ground two or three years or more, unremoved; when by their being increased by off-sets into large bunches, each will send up several flower-stalks, and show a large cluster of flowers, appearing considerably more conspicuous and beautiful than when the flower-stalks rise singly: remark, however, it is proper to take up the bulbs in general

general every third or fourth year, in order to separate the off-sets, which in that time will be increased so greatly in number, that the bulbs pressing close against one another, the inner ones will be so much compressed and weakened, as greatly to impede their efforts for flowering.

But where these bulbs are intended for sale, they should generally be lifted once a year, or once every two years, otherwise, as by their growing close in clusters pressing against one another, they will be flattened thereby, and rendered unsightly, and less saleable.

The only proper time of year for taking up all the sorts is soon after they have done flowering, when their leaves and flower-stalks assume a state of decay; at which time of lifting the bulbs, separate them all singly, and the smaller off-sets from the larger, reserving the large roots for planting again in the principal compartments, and the smaller may be deposited in nursery beds for a year or two, to gain strength, when they will become proper blowing roots; and may then be taken up at the proper season, in order for planting where wanted.

When the roots are lifted at the above proper season, they may either be planted again directly, or in a month or six weeks after; or may be cleaned and dried, and retained out of the ground in a dry room, two or three months, or longer, if occasion shall require; but, as before suggested, I should advise the principal part to be committed to the earth again in autumn, i. e. in September, October, or November.

Blowing them in Glasses of Water, &c. in Winter, to ornament Rooms.

The *Polyanthos-Narcissus*, and some other large *Narcissus* kinds, and the large Jonquils, are also in great esteem for blowing in glasses of water, in rooms, in winter, and early in spring, before those in the open ground come into bloom; any of the other species may also be flowered in the same manner; observing to procure such roots as were lifted at the proper season above mentioned, housed, and preserved dry, firm, and sound.

The glasses for this use are of the bottle kind, of about two or three to five or six-gill size, with a straight upright body, widest at bottom, and with a wide concave mouth to contain each one bulb, as explained under the article *HYACINTH*, and are sold at most of the glass and seed shops. The season for using them is, any time in winter, or early in spring, from October or November till February or March: observing to fill them with fresh soft water, so full as the bottom of the bulb may just touch it; so place one bulb in each glass as afore-

said, and place the glasses in any light warm room near the windows, or, if where the sun comes, it will be of additional advantage: the roots will soon send out fibres downward into the water, and leaves and flower-stalks at top, and flower strong and agreeably in the dead season of winter, and beginning of spring, attended with a delightful fragrance.

The water should always be kept up to the proper height in the glasses, adding an entire fresh supply every two or three weeks, or according as the old becomes foetid or foul.

We may see many of these bulbous-rooted plants blown in the above manner, in great perfection, in winter and spring, in the seed-shops in London; particularly the *Polyanthos-Narcissus*, and fine Jonquils, Hyacinths, &c.

The same plants may also be brought to early bloom in pots. Plant the bulbs in pots of light earth, or sandy soil, which place in a warm room, as directed for the glasses, placing them in plates of water occasionally, when the earth wants moistening, and take them out again when moist enough; and thus they will blow at an early season.

But such as have the advantage of stoves, or hot-houses, &c. may obtain the most early bloom, by introducing the above glasses and pots of bulbs therein, placing them upon shelves, or where convenient; or some of those pots may be plunged in the bark-bed to forward their flowering; and they will hereby all produce very fine flowers from December till the end of March, without much trouble.

We must observe, that to enjoy the pleasure of this winter floral scene of these kinds, the largest bulbs are always to be chosen, otherwise it will be impossible to compass it with any degree of perfection.

The bulbs made use of for this purpose, although they rarely serve for the same use again, yet they will not be lost, but may be continued in vigour for increase, provided they are taken out of the glasses or pots as soon as the flowers are gone off, and after cutting off their tops and fibrous roots, plant them in beds of mould to stand till the proper lifting season; in the mean time they will there multiply by off-sets, and thus prove a nursery to supply your pots and glasses.

Any or all the sorts of *Narcissus* may be obtained at most of the principal nurseries and seed-shops, where they are commonly sold by the hundred, or dozen, or as may be required, which, in the common uniflorous kinds, both of yellow white sorts, are generally from two or three to five or ten shillings per hundred, or nearly in proportion for smaller quantities: but the larger kinds, and the *Polyanthos-Narcissus*, are in some, double or treble that price,

and some sorts very considerably more; the Jonquils are commonly about five to ten or twelve shillings, according to the sorts, or whether single or double, as the largest double kinds are much higher priced, especially the large Dutch sorts for blowing in glasses, &c.

Most of the principal nursery-men and seedsmen about London import a great variety of the *Polyanthos-Narcissus* annually from Holland and Italy, the Dutch in particular, being famous for raising many new varieties of this species, and of all other curious bulbous-rooted flowers, from seed, with which they supply this and other countries, and make us pay well for their industry.

However, after procuring a few roots of each sort, you may with care greatly increase the stock in two or three years.

Propagation of all the Sorts.

The propagation of all the sorts of *Narcissus* is effected principally by their abundant off-sets from the roots; also by seed to obtain new varieties.

By Off-sets.—All the sorts increase plentifully by off-set-bulbs from the main roots annually; and the proper time for separating them is in summer, when they have done flowering, and the leaves and stalks begin to decay, as observed of other bulbous roots; at which time the roots may either be taken up every year or two, to separate the off-sets, but should not remain longer unremoved than three years, when each root will be then multiplied by its off-sets into a large cluster, and, as we before noticed, it is necessary to lift them, especially the principal sorts, to divide the increased parts; reserving the main bulbs to plant, as before directed, for the succeeding year's bloom; and the off-sets should be set in nursery rows, planted two inches deep, either by dibble or in drills, and six inches from row to row; to remain to have one or two years growth, when they will have become large bulbs capable of producing flowers in full perfection; and being then taken up at the proper season, may be planted in autumn following, in any place where required.

By Seed.—This mode of propagation is rarely practised to any but the *Polyanthos-Narcissus*, and that principally for the sake of new varieties: I would observe, however, that this work of raising them from seed is exceedingly tedious, as it will be often six or seven years before the seedlings will flower in perfection; it is nevertheless practised by many curious florists, more particularly those of Holland, as before observed, who exceed all the world in their patience and industry in raising seedling bulbous flowers, for increasing the number of new varieties, which they

often sell at a high price; and the following is the method of raising seedlings of the *Narcissus* kind.

The seed ripens in June or July, which sow soon after in pots or boxes of light rich earth, half an inch deep; then place them to have only the morning sun till October, at which time place them in a full sunny situation for the winter, allowing them shelter in severe frosts. In March or April they will come up: give frequent sprinklings of water, and occasional shade from the mid sun at their first appearance; and as the warm season advances, move the pots to an eastern aspect, to have only the morning sun till ten or eleven o'clock. In June or July the leaves will decay, when stir the surface lightly, and clear off the decayed leaves, all weeds and mossiness, then sift a little fine mould over the surface, half an inch thick, repeating it again in October or November; and here let them remain undisturbed till the third year, each year repeating the above work; and in the third summer, at the decay of the leaves, take up the bulbs, and separate the largest, which plant in beds, by drilling, in rows, five or six inches asunder, and three deep; and the small bulbs you may scatter, mould and all, on the surface of another bed, and cover them two or three inches deep with fine earth, which after a year's growth may be transplanted in rows, as above.

In these beds let the seedlings remain till they show flowers, and after the second year's bloom you will be able to judge of their properties, when mark the good sorts, and manage them as already directed for the blowing roots.

NECTARIUM, (from *Nectar*, or honey) a part of the corolla forming a sort of appendage to the petals of some flowers, and is of various structures, figures, sizes, and situations; is generally hollow, or with a cavity, sometimes containing the Nectar or honey under a fluid-form that oozes from the plant, and is supposed to serve some secret purpose of fructification.

The *Nectarium*, however, although a part belonging to the corolla, is considered distinct from the petals, as differing therefrom in point of structure, form, and size, yet is often of the same texture of the petals, and often of a different nature.

But the *Nectarium* appears in a wonderful variety of forms, &c. in different genera; in some it is united with the petals, in others separate. Its situation is sometimes within, and sometimes withoutside of the corolla; sometimes in the calyx, and sometimes on the ger-men, filaments, and antheræ. In figure, in some

some sorts, it is in form of a tube, in others like a cup or dish; in some it is wide and spreading, often appearing like an additional petal; and in some is very large, equalling the whole corolla in size, and sometimes larger, and very conspicuous; and in some flowers it is very small, frequently appearing like a pore, a point, fibres, &c. in some it assumes a horn-like appearance; sometimes it fits close, and in some it is elevated upon a sort of style, or pedunculi, &c. and in a vast variety of other forms.

The Nectarium, therefore, in point of situation and figure, is exceedingly various in different genera, as before noticed, but is frequently situated at the base of the corolla; sometimes in form of a narrow tube, as in some monopetalous tubular flowers, the lower part or tube being generally found to contain the *Nectar* we formerly mentioned: in many flowers its situation is also at the base, and stretch out behind very conspicuously into a long tube, like a horn or a cock's-spur, as in lark-spur, nasturtium, toad's flax, columbine, balsamine, orchis, &c. sometimes it is situated in the centre of the corolla, and shaped like a cup or a bell, as in *Narcissus*, and in which it is frequently, or most generally, called the cup, in some of which species it is very large and conspicuous: in some genera it is swollen like a bladder, and hollow, as in *cypripedium*, or lady's-slipper, in which it is situated in the midst of the five petals, and is of singular structure, very large, and fancied to resemble the shape of a slipper, or wooden shoe. In passion-flower it is situated in the middle of the corolla, consisting of many short beautiful fibres, disposed in rays, in three series or circular rows round the style, forming a sort of triple crown, exhibiting a singularly curious appearance; which is also the case of the Nectaria in many other genera.

When the Nectarium is distinct from the petals, it is commonly very irregular, and affords many singular and curious variations.

Any farther description of this striking appendage, or superfluity of the corolla, would be unnecessary in this place, as being so very different in different genera, and both its form and situation is attended to in discriminating the *characters* of the respective genera that are furnished with a *Nectarium*.

The Nectarium often furnishes one of the essential marks in discriminating the characters of many genera.

Plants which have the Nectarium entirely distinct from the petals, that is, not united with their substance, are commonly poisonous, in some degree, such as the *aconitum* or monk's-hood, columbine, dog's-bane, helle-

bore, *asclepias* or swallow-wort, *nigella*, oleander, *narcissus*, *dictamnus albus*, or white dittany, and several other sorts.

NEPETA, Nep, or Cat-mint.

The plants are herbaceous perennials for variety in the pleasure-garden, and for medical use; rising with slender branching stems, a foot or two high; garnished with heart-shaped and lanceolate leaves, and the branches terminated by verticillate spikes of monopetalous ringent flowers.

Class and order, *Didynamia Gymnospermia*.

Characters.] CALYX is monophyllous, tubulous, and five-parted at top. COROLLA is monopetalous, with a cylindric incurved tube, ringent or gaping at top; the upper lip roundish, emarginated, and erect, the under one large, roundish, concave, and entire. STAMINA, two long and two short filaments, terminated by incumbent antheræ. PISTILLUM, a quadrifid germen, slender style, and bifid acute stigma. PERICARPIUM, none; the seeds lodged naked in the calyx.

There are several different species, but not more than one common in the English gardens, viz.

NEPETA *Cataria*.

(*Cataria*)—or *Common Cat-mint*.] Hath a creeping perennial root; many upright square stems, branching two feet high; heart-shaped, dentated-ferrated, opposite leaves, hoary underneath, each on a long foot stalk; and the branches terminated by whorled spikes of white ringent flowers, the under verticilli having short pedicles: flowering in June.

Varieties.] Larger Cat-mint—smaller Cat-mint—narrow-leaved—blue-flowered—purple-flowered.

This species and varieties have great fragrance, partaking of mint and penny-royal; is cultivated in gardens both for medicine, and to effect variety in the herbaceous collections.

The name *Cataria*, or Cat-mint, originates from the circumstance of the cats being so remarkably fond of the plant that they eagerly repair to it, roll themselves thereon, bite and tear it to pieces, chewing it in their mouths, and often in a short time entirely destroy the plants. It has been by some observed, that if you raise this plant from seed, and it remains where sown, the cats will not meddle with it, but if by slips, or if transplanted, they will soon destroy it. Whence proceeds the saying—

If you set it, the cats will eat it;

If you sow it, the cats won't know it.

This, however, does not always hold good invariably.

It grows naturally in England by hedgesides, and on the sides of banks, but it has

been long admitted an inhabitant of gardens, both for its singularity, and for medical use.

Its propagation is by seed, by parting the roots, and by slips or cuttings.

By Seed.—Sow it either in autumn, or early in spring, in any bed or border of light earth, and rake it in; and when the seedlings are two or three inches high, plant them out in nursery-beds to remain till autumn, and then transplant them where they are to remain.

By Parting the Roots.—In autumn or spring divide the roots into slips, which, being planted separate, will soon become good plants.

By Slips or Cuttings of the Branches.—In April, May, or June, slip or cut off a quantity of young shoots, plant them in a shady border, and supply them with water: they will become good plants by autumn.

NERIUM, *Oleander*, or *Rose-Bay*.

This genus comprehends beautiful ever-green flowering shrubs for the green-house and stove, of upright branchy growth, adorned with long, spear-shaped, stiff, ever-green leaves; and large monopetalous, funnel-shaped, quinquepartite, nectarious flowers, in clusters, from the sides and ends of the branches, of very ornamental appearance.

Class and order, *Pentandria Monogynia*.

Characters.] CALYX is acutely five-parted, small, and permanent. COROLLA is monopetalous and funnel-shaped, a short cylindric tube, having the upper part large, and divided into five broad, obtuse, oblique segments, and a nectarium terminating the tube, being divided into many hair-like parts, arranged in a coronated form. STAMINA, five very short, awl-shaped filaments, terminated by arrow-pointed, connivent antheræ, ending in long threads. PISTILLUM, a roundish bifid germen, cylindric style, and truncated stigma. PERICARPIUM, two long, taper, acuminate, univalvular pods, furnished with numerous oblong seeds, placed *imbricatum*, and crowned with down.

There are several species, consisting of one for the green-house; the others for the stove; but the former is the most noted in our gardens, and furnishes several elegant varieties.

Green-house Kinds.

1. NERIUM, *Oleander*.

(*Oleander*)—Common *Oleander*, or *Rose-bay*.] Rises with an upright woody stem, branching six or eight feet high, having a purple or green bark in different sorts; long, spear-shaped, stiff-leaves, from about three to five or six inches long, and one broad, placed ternate or by threes round the branches: and at the axillas and ends of the shoots large loose bunches of very ornamental flowers of differ-

ent colours and properties in the varieties. Flowering in July and August.

Varieties.] Red-flowered *Oleander*—scarlet-flowered—white-flowered—broad-leaved double-flowered—striped double-flowered—striped leaved.

This species and varieties are not only fine ever-greens, but produce large clusters of exceeding ornamental flowers: the double-blossom kinds in particular have superior beauty, the flowers being very large, and the corolla multiplied in several series, having some resemblance to middling double roses; are numerous, very conspicuous, and fragrant, continuing in succession a month or two in full lustre.

They are exotics from the island of Crete and India, but all the varieties are hardy enough to succeed in the open air here in summer, and in a green-house in winter.

Observe, however, the double-flowered kinds being rather of a more tender temperature than the singles, that they generally flower the most perfectly when indulged with a stove, even if only placed therein, or in a glass-case, about the time of year they are expected to make an effort for flowering, and their flowers will continue longer in beauty; often exhibiting a succession of elegant flowers from July until October.

Let all the sorts be potted in light rich compost, and move them into the green-house, &c. in autumn, at the approach of cold weather. Supply them with water once a week in winter, or oftener, according as they shall seem to require, but give more frequent waterings in summer, in proportion to the heat and drought of the season; and according as they advance in size, shift them into larger pots of fresh mould: their further general culture is as directed for other shrubby green-house exotics.

Hot-house, or Stove Kinds.

2. NERIUM *odorum*.

Sweet-scented Rosebay, or Oleander.] *Oleander* with ternate linear-lanceolate leaves, and many-parted nectaria.

3. NERIUM *antidysentericum*.

Antidysenteric oval-leaved Rosebay, or Oleander.] *Oleander* with oval-oblong leaves and flowers, in a terminal panicle.

4. NERIUM *coronarium*.

Broad-leaved Rosebay, or Oleander.] *Oleander* with elliptic leaves, and two-flowered peduncles from the forks of the branches.

Variety.] With an oblong leaf, and double white sweet scented flower.

5. NERIUM *zelanicum*.

Ceylon opposite-leaved Oleander.] With erect branches, and spear-shaped opposite leaves.

6. NERIUM

6. *NERIUM divaricatum*.

Divaricated-branched Oleander.] With the branches diverging afunder, lanceolate-ovate leaves, and white flowers.

Their Propagation.

Their propagation is by layers, cuttings, and by suckers from the root.

By Layers.—This may be performed any time from March until May, but the earlier the better; and the youngest lower branches are to be chosen; which lay by slit-laying: give plenty of water all summer as they shall require, and they will be mostly rooted by the following autumn; but by plunging the pots in which they are layed, in a bark-bed, the rooting of the layers may be greatly forwarded: when properly rooted transplant them into separate pots.

By Cuttings.—In spring or the early part of summer, take off cuttings of the young shoots, five or six inches long, and plant them in large pots of rich mould, which place under glasses, and give water and shade occasionally: but if plunged in a bark-bed it will promote and forward their rooting more effectually.

By Suckers.—Suckers often arise from the bottom, sometimes furnished with roots, but if not, give each a small slit at the lowest part; then apply fresh mould around it, and fibres will be emitted by the end of summer; then take them off and pot them separately.

NICOTIANA, Tobacco-plant.

This genus of plants are tall herbaceous annuals of America, where they are cultivated in vast quantities for their leaves, of which is prepared that well known commodity called *Tobacco*; and are raised here in many gardens for variety, which they effect most agreeably in their upright growth, and noble large foliage; they rising each with an upright strong stem, from three to six or eight feet high, branchy at top; ornamented with large, oblong, simple leaves, from about ten or twelve inches to a foot and a half long, and proportionally broad; and monopetalous. infundibuliform flowers terminating all the branches plentifully in loose bunches.

Class and order, *Pentandria Monogynia*.

Characters.] CALYX is monophyllous, five-parted, and permanent. COROLLA is monopetalous, infundibuliform, having a long tube, spreading above, there terminating in five parts. STAMINA, five long subulate filaments, and oblong antheræ. PISTILLUM, an oval germen, long, slender style, and capitated emarginated stigma. PERICARPUM, an oval, furrowed, bilocular capsule, opening at top, and numerous kidney-shaped seeds.

Tobacco was introduced into Europe in the year 1560, discovered first in the island Tobago in America, and by the natives is called *Tabac*, hence the English appellation Tobacco; but the generic name *Nicotiana* is derived from one Mons. Nicot, who first introduced the seed of the plants into the European gardens.

There are several species, but the most remarkable sorts known in the English gardens, are the two following:

1. *NICOTIANA Tabacum*.

Common Virginia Tobacco.] Hath fibry roots; an upright, round, strong stem, rising from about five or six to eight or nine feet high, dividing near the top into branches; very large, spear-shaped-oval, sessile, decurrent leaves, from ten to eighteen inches long, and half as broad; and the stem and branches terminated by loose panicles of acute pale-red flowers.

Varieties.] Great broad-leaved—narrow-leaved.

2. *NICOTIANA rustica*.

Rustic Hardy English Tobacco.] Hath a fibry root; an upright firm stem, rising three or four feet high; large, oval, entire leaves, having foot-stalks; and the stem terminated by small loose panicles of yellowish-green obtuse flowers.

These plants are of the annual tribe; natives of most parts of America, but tolerably hardy, so as to prosper in our gardens as in their native soil: the first sort, however, is rather a little tender while young, requiring generally to be raised and forwarded in a hot-bed until May; but the second species is exceeding hardy, and was the sort first introduced into the English gardens; and being so hardy as to ripen great plenty of seeds freely every year, and that from the scattered or self-sown seeds in autumn, the plants rise plentifully the following spring without trouble, as if natives of England: from which circumstances, in this country, it is often called English Tobacco. The first species, however, is the finest plant, both in its procerity of growth, largeness of the leaves, and beauty of its flowers, and superior in its economical property.

They flower here in July and August: the flowers are collected into clusters, each flower is of one funnel-shaped petal, spreading and five-parted above; continuing in succession until the end of summer; succeeded by ripe seeds in autumn.

The seeds of these plants are very small, generally about 1000 in each capsule, and the whole produce of a single plant is estimated at 360,000.

With

With respect to the merit of these species in this country as garden-plants, they are cultivated in many curious gardens, as ornamental annuals for the pleasure-ground, but more particularly the first species, which attaining a fine majestic stature, adorned with most luxuriant leaves, and large clusters of delicate red flowers terminating all the shoots; they in the whole exhibit an elegant appearance in autumn. The second sort has also merit enough to recommend it for admittance in a collection in assemblage with the others, &c. to effect a greater variety. Both the sorts are also cultivated in some gardens for use, the leaves are the useful part; are in perfection early in August, just when they come into flower, and before the under-leaves begin to wither.

As both the species perish annually in winter, a fresh supply must be raised every spring.

Their Propagation.

Their propagation is by seed annually in March or April, the first sort in a hot-bed, the second in the natural ground.

First Sort.—This being rather a little tender whilst young, in order to have it brought to perfection as soon in the summer as possible, it is proper to sow the seeds in a moderate hot-bed in March or April, covering them near a quarter of an inch deep: the plants will soon come up; allow them fresh air daily, and occasional waterings; managing them as directed for annuals of similar temperature, such as *chrysanthemum*, African marigolds, &c. and in May or early in June, when the seedlings are from about three to six inches high, plant them out in moist weather, in the open ground: those designed for ornament, plant singly in the different compartments of the pleasure-garden, and those intended for use may be set in rows any where, three feet asunder; as soon as planted give a good watering, and repeat it occasionally till the plants have got fresh root; and they will soon set to growing luxuriantly, so as to acquire their full stature in July or August, and continue in beauty till October.

Note, this species may also be raised by sowing the seeds in a warm border in April, for transplantation as above, or also occasionally by sowing in patches in the flower-borders, &c. to remain; thinning the plants to one in each patch.

Second Sort.—This sort being of a hardier nature, you may sow the seeds in any bed or border in spring, and rake them in lightly; they will readily come up: when the plants are three inches high, plant them out where

they are to remain; or may sow the seed in patches to remain, and thin the plants to one in each patch, as above.

NIGELLA, (*Nigella*) Fennel-flower, or Devil-in-a-Bush.

This genus consists of hardy, herbaceous, annual flowers for the pleasure-garden, rising with upright branchy stalks a foot and a half high, adorned with multifid or finely-divided leaves, resembling those of fennel or dill, and with all the branches terminated by large, spreading, pentapetalous flowers singly; and as some of the plants being of bushy growth, and each flower having five or ten long horn-like styles and capsules, and which in some species are closely surrounded at the sides and top, by a large, leafy, finely-divided involucre, forming a sort of bush as it were around them; hence originated the strange name, Devil-in-a-Bush.

Class and order, *Polyandria Pentagynia*.

Characters.] CALYX, none; only some long, finely-multifid, floral leaves, appearing like a perianthium, or a sort of involucre. COROLLA, five oval, plane, obtuse, spreading petals, contracted at the base; and eight very short bilabiated nectaria placed in a circle. STAMINA, numerous short subulate filaments, and compressed erect antheræ. PISTILLUM, five or ten oblong, convex, erect germina, ending in the same number of very long, awl-shaped, revolute, permanent styles, and stigmas growing longitudinally. PERICARPium, five or ten oblong, compressed, acuminate capsules, connected by their inner side, and filled with numerous angular rough seeds.

There are about five species, all annuals, remarkable for some having five styles, and some ten.

1. NIGELLA *damascene*.

Damascened Five-styled Nigella.] Rises with an upright stem, branching a foot and half high; garnished with finely-multifid leaves, the segments long, very narrow, and numerous; and large flowers surrounded by a long leafy involucre; and hath five horn-like styles.

Varieties.] Common pale-blue-flowered—with white flowers—with double flowers of both kinds.

2. NIGELLA *hispanica*.

Spanish Ten-styled Blue Nigella.] Rises with an upright branchy stem, a foot and a half high; garnished with multifid leaves, having broader segments; and each branch and shoot terminated by one large blue flower, having ten styles of equal length with the corolla.

Variety.] With double flowers.

3. NIGELLA

3. *NIGELLA sativa*.

Cultivated Egyptian Five-styled White Nigella.] Rises with an erect, branchy stem, about a foot and a half high; shorter, multifid, somewhat-hairy leaves; and each branch terminated by one large white flower, having five styles succeeded by roundish prickly capsules.

Varieties.] Double-flowered—dwarf-stalked—sweet-scented.

4. *NIGELLA orientalis*.

Oriental Ten-styled Yellow Nigella.] Rises with an upright stem, branching a foot and a half high; long, finely-multifid leaves; and at the ends of the branches small yellow flowers, having ten styles, longer than the corolla.

5. *NIGELLA arvensis*.

Field, Five-styled, Blue, German Nigella.] Rises with a slender branchy stem, about a foot high; very finely-multifid leaves; and pale-blue naked flowers singly, having entire petals, and five styles; succeeded by large turbinated capsules.

All these five species are annual, rising from seed in spring, and totally perish in autumn, after having flowered and perfected their seeds.

They all flower here in July and August, the flowers are moderately large, of five oval plane petals, succeeded by several oblong compressed capsules, all united, each terminated by the permanent style like horns, generally bending different ways; and each capsule filled with numerous seeds, ripening in autumn.

The plants are all very hardy, and grow freely any where in the open compartments.

All the sorts may be employed in the pleasure-garden, as plants of variety and ornament, in the collection of hardy annuals; but the first two sorts, and varieties, are the most commonly known in the English gardens, and are generally the most ornamental in the size and beauty of their flowers: though all the sorts, both single and double-flowered varieties, may be preferred for general culture; all of which being disposed in patches, sowing the seeds at once where they are to remain to flower, they will exhibit a pretty variety in assemblage with other annuals.

Their Propagation, &c.

Their propagation is by seed in the open borders, &c. in March and April: or if some are sown in autumn, and one or two sowings performed in spring, the autumnal-sown plants will flower strong and earlier, and will be succeeded in bloom by the spring-sowings.

whereby the season of flowering will be greatly prolonged.

Sow the seed in patches about the borders, at once where you design the plants shall flower, for they rarely succeed by transplantation, covering it near half an inch deep; and when the plants are come up an inch or two high, thin them where too close, to three in each patch, and keep them clean from weeds is all the culture they require; and they will all flower at the proper season, and produce plenty of seed for future propagation.

As all the sorts perish totally in winter, a fresh supply must be raised annually from seed, as above.

NOLANA (Nolana.)

Consists of one species for our notice, a low, herbaceous, tender annual of trailing growth, producing small, but very delicate, monopetalous, bell-shaped, ornamental flowers.

Class and order *Pentandria Monogynia*.

Characters.] CALYX is monophyllous, turbinate-five-angled, and five-parted. COROLLA, monopetalous, bell-shaped, plicated, spreading, and double the size of the cup. STAMINA, five awl-shaped, erect filaments, and sagittate antheræ. PISTILLUM, a roundish, four-parted germen, cylindric style, and capitated stigma. PERICARPIUM, none; four or five roundish succulent seeds, lodged in the bottom of the calyx or inner base of the receptacle.

We know of but one species in our gardens, viz.

NOLANA prostrata.

Prostrate, or Trailing Nolana.] Hath a fibrous root, sending out several slender, prostrate stalks, garnished with small, deltoid-angulate, rough leaves; and from the sides of the branches, opposite to the leaves, come out the flowers of a fine blue colour, pencilled with dark streaks, and have light-blue antheræ.

This tender annual, originally a native of Peru, has been long in many of our principal gardens, associated among the tender tribe for the beauty of its flowers, appearing in June, July, or great part of the summer months.

It is raised from seed sown annually in spring in a moderate hot-bed with others of a similar quality, as African and French marigold, china-aster, &c. the plants inured by degrees to the full air in June; then planted, some into pots, others in the front of borders, &c. where they will flower abundantly in summer, and ripen seeds in autumn.

NURSERY, a most useful district of gardening, appropriated for the raising and nursing all sorts of trees, shrubs, and herbaceous plants

plants to a proper growth, for supplying and recruiting the different gardens, orchards, plantations, &c.

In the Nursery-garden are raised all the different sorts of fruit-trees, and fructiferous shrubs, by the methods directed for each sort under their proper genera, nursing and training them up to a proper size and growth for planting in the garden or orchard, where they are finally to remain to produce their fruit.

Likewise in the Nursery is raised the vast train of forest-trees, hardy ornamental trees, and shrubs in general, both deciduous and ever-greens of all those kinds, and training them up to a proper size for the purposes for which they are designed in the plantations and pleasure ground.

And in the Nursery may also be raised all the sorts of hardy herbaceous plants, both fibrous-rooted, bulbous, and tuberous-rooted kinds, for adorning the pleasure-garden, and to plant for medical use, &c.

All sorts of the above kinds may be readily raised together in the same Nursery in separate compartments.

A Nursery thus furnished with the different sorts of all kinds of trees, shrubs, and herbaceous plants, will prove an inexhaustible source of accommodation both for private and public use.

The raising or propagation of the numerous kinds is performed by various methods, as by seed, suckers, layers, cuttings, slips, offsets, parting the roots, grafting, budding, &c. each of which methods as directed under their proper heads, as also in the respective articles under their proper genera: and after being raised by either of the above methods, and stationed in Nursery-rows, they are to remain until they have acquired a proper growth for their respective uses, then to be transplanted into the garden, orchard, plantation, &c. where they are designed finally to remain, to effect the several purposes for which they are calculated, either for use, ornament, or variety; observing, that as a recruit of some or other of the various sorts will be required to be drawn off every year, to supply the different gardens and plantations, a fresh supply of young plants should also be raised accordingly every year in the Nursery, of most of the various kinds, so as to have this district always fully stocked with all kinds in several different degrees of growth; some in seed-beds, others transplanted in Nursery-rows; some one year, others two, three, or several years: all of which should be well attended to, both in private and public Nurseries, that there may be a sufficiency of plants of all sorts for furnishing

every different department of gardening as they shall be occasionally wanted.

In the public Nursery-gardens they have also convenient green-houses, glass-cases, and stoves, with their proper appendages, for raising the tender exotics from the warmer parts of the world; each of which departments are always stationed in the warmest and most sunny situation, having their front directly facing the south, to have all possible benefit from the sun's influence; and each principal department having its different appendages, as aforesaid, which are smaller departments of frame-work, sashed and glazed, either adjoining to the main ones, or detached; serving as seminaries or Nurseries for raising and nursing the various tender plants to a proper growth for furnishing the other larger conservatories.

Thus a Nursery-ground, furnishing all sorts of plants of different temperatures, will prove a most valuable department of gardening, and its various growths will afford the most agreeable source of variety at all seasons, which to many will appear as ornamental and desirable as the most elegant pleasure-ground or flower-garden.

Its Extent, Soil, Situation, &c.

With respect to the proper extent or dimensions of a Nursery, whether for private use, or for public supply, it must be according to the quantity of plants required, or the demand for sale: if for private use, from a quarter or half an acre to five or six, may be proper, which must be regulated according to the extent of garden-ground and plantations it is required to supply with the various sorts of plants; and if for a public Nursery, for any general cultivation, not less than three or four acres of land will be worth occupying as such, and from that to fifteen or twenty acres, or more, may be requisite, according to the demand, though some occupy forty or fifty acres in Nursery-ground.

In the neighbourhood of London, for eight or ten miles round, there are a great number of extensive public Nurseries, most beautifully furnished with a great variety of all sorts of trees, shrubs, and herbaceous plants, of many different degrees of growth, for supplying noblemen and gentlemen's gardens and plantations, for some hundreds of miles distant at home and abroad; as also all sorts of seeds. Most of which Nurseries are also furnished with proper green-houses, glass-cases, hot-houses, or stoves, &c. for the raising various kinds of curious tender exotics for public supply.

With regard to soil for a Nursery, the nature and quality of this, without all dispute, requires

requires our particular attention. The Nursery-men generally prefer a loamy soil of a moderately light temperament, if possible, such as in most of the Nursery-grounds around London: however, a Nursery may be of any fat moderately light land, that is fifteen or eighteen inches depth of good working staple, but if two or three spades deep it will be the greater advantage; and where there is scope of ground to chuse from, always prefer that where there is a good depth, and a naturally rich or fat soil, for the soil of a Nursery cannot be too good, notwithstanding what some advance to the contrary; for if the soil prove poor and lean, the plants raised thereon will be languid, weak, and stunted; and no remedy, how artful soever, will be able to rectify their constitution, especially all the tree-kinds: whereas those raised in a good mellow soil always assume a free growth, and advance with strength and vigour. It is not absolutely requisite, however, that the soil should be exceedingly rich, nor over carefully manured: a medium between the two extremes is best; such as any tolerably substantial garden-ground, or good mellow pasture land, having the sward trenched to the bottom, is excellent for the growth of trees; any similar eligible soil of corn-fields is also extremely proper; or any other good soil of the nature of common garden-earth is also very well adapted for a Nursery.

As to situation; if this is rather somewhat low than high, it will be the better, because it is naturally warmer, and more out of the power of cutting and boisterous winds than a higher situation; though if it happens where some parts of the ground is high and some low, it may be an advantage, the better to suit the nature of the different plants. It is also of singular advantage to have a Nursery-ground fully exposed to the sun and free air, and if possible, where there is the convenience of having water for the occasional watering of young seedlings, and newly transplanted plants.

And as to a Nursery for private use, with regard to its place of situation, respecting the other garden districts:—where there is room, it may either be entirely detached, or may be somewhat contiguous to the outer boundaries of the shrubbery plantations of the pleasure-ground, and so contrived as to lead insensibly into it by winding walks, so as to appear part of the garden.

Its Fences, Preparing and Laying-out the Ground.

A fence round the whole ground is necessary: this may either be a hedge and ditch, or a paling; the former is the cheapest, and in the end the most durable; though in some

places where hares and rabbits abound, paling fences at first are eligible, for preserving the Nursery from the depredations of those animals which often do great mischief to the young plants, by barking and cropping them: a good hedge-and-ditch fence, however, may be made very effectual against the inroads of both men and brutes; and the most eligible plants for this purpose is the haw-thorn; for the method of raising of which, and forming a proper hedge of them, see *CRATÆGUS Oxyacantha* and *HEDGES*: but a paling, or other similar close fence, either in general or part, would be extremely useful, against which to train young wall-trees to a proper growth for garden-wall plantations.

The ground must then be all regularly trenched one or two spades deep, according as the natural depth of the soil will admit, for by no means dig deeper than the natural good soil, being either one spade, one and a half, or two spades deep; observing the same general method as directed under the article *DIGGING and TRENCHING*.

Then, having trenched the ground, proceed to divide it by walks into quarters, and other compartments; a principal walk should lead directly through the middle or some principal part of the ground, which may be from five to eight or ten feet wide, according as it shall seem proper for use or ornament, having a broad border on each side: another walk should be carried all round next the outward boundary, four or five feet wide, leaving an eight or ten feet border next the fence all the way; then may divide the internal part by smaller cross walks, so as to form the whole into four, six, or eight principal divisions, which are commonly called quarters.

One or more of the divisions must be allotted for a seminary, i. e. for the reception of all sorts of seeds, for raising seedling plants to furnish the other parts; therefore divide this seminary-ground into four feet wide beds, with foot-wide alleys at least between bed and bed: in these beds should be sown seeds, &c. of all such trees, shrubs, and herbaceous plants as are raised from seed; and which seeds consist both of the various sorts of kernels and stones of fruit, to raise stocks for grafting and budding; seeds of forest trees, ornamental trees, shrubs, &c. and seeds of numerous herbaceous perennials, both of the fibrous-rooted and bulbous-rooted tribe; the sowing season is both spring and autumn, according to the nature of the different sorts, which is fully illustrated under their proper genera; and when the young tree and shrub seedling-plants so raised, are one or two years old, they are to be planted out in

Nursery-rows into the other principal division; but many kinds of herbaceous plants require to be pricked out from the seed-beds, when but from two to three or four months old, as directed for each under their own respective heads. On the other hand, most kinds of bulbous seedlings will not be fit for planting out in less than one or two years.

Another part of the Nursery-ground should be allotted for stools of various trees and shrubs, for the propagation by layers, by which vast numbers of plants of different kinds are propagated. These stools are strong plants of trees and shrubs, planted in rows three or four feet distance every way, and such of them as naturally rise with tall stems, are, after being planted one year, to be headed down near the ground, to force out many lower shoots conveniently situated for laying. See **LAYERS** and **STOOLS**.

And as to cuttings, suckers, slips, off-sets, &c. those of hardy trees, shrubs, and plants, may be planted in any convenient compartment, and in shady borders, &c. and for the more tender kinds, should allot some warm sheltered situation.

The other principal divisions, therefore, of the Nursery-ground, is for the reception of the various sorts of seedling plants from the above seminary-quarters; also for all others that are raised from suckers, layers, cuttings, &c. there to be planted in rows from one to two or three feet asunder, according to their natures of growth: observing to allow the tree and shrub-kinds treble the distance of herbaceous perennials. Of the tree and shrub kinds some are to be planted for stocks to graft and bud the select sorts of fruit-trees upon, and other choice plants, which are usually propagated by those methods; others are trained up entirely on their own roots without budding and grafting, as in most forest and other hardy tree kinds; as also almost all the sorts of shrubs; particulars of all which are exhibited, each under its proper genus. Here they are to remain to have two, three, or several years growth, according as they shall require for the several purposes for which they are designed in their future situations in the garden and plantations, &c. which is directed in their respective cultures.

In a complete Nursery it is also proper to allot some dry warm sheltered situation in the full sun, on which to have occasional hot-beds of dung or tan, in raising and forwarding many sorts of tender or curious exotics by seed, cuttings, suckers, slips, &c. and for which purposes of hot-bed, should be furnished with eligible frames and lights, hand-

glasses, garden-mats, &c. and other relative requisites.

The Methods and Seasons for Sowing, Planting, Transplanting, and Raising the various Plants of this Department.

With regard to the manner of performing the various methods of propagation for raising the numerous Nursery-plants, is fully exhibited also under the following heads, in the course of this work: *sowing seeds—layers—cuttings—suckers—slips—off-sets—parting-roots—grafting—inoculation.* And the sorts that are usually propagated by either of those methods, are pointed out under their several respective heads, with particular directions of the several ways each method is performed on the different kinds.

The season for performing the works of sowing, planting, &c. is different in different kinds, but autumn and spring are the principal seasons.

Some sorts require to be sown in autumn, others not till spring, which is particularly explained for the various sorts under the articles themselves.

And as to planting or transplanting, the principal season is from October until March, or even until April for tender kinds, especially many of the ever-green tribe; but most other hardy trees and shrubs may be transplanted any time in winter, in open mild weather, from October until March, as just observed; though generally, either the autumn season, from about the middle or latter end of October to the end of November, or in the spring, February and March, are the most eligible seasons for all principal planting: and for the tender kinds of ever-greens, &c. early in autumn, or not till settled weather in spring, is the proper time to remove these sorts.

But as to hardy herbaceous fibrous-rooted plants they may be transplanted almost any time in autumn or spring; even many sorts in summer, when planting them out from the seminary: observing, however, autumn (September and October) and spring (February and March) is the proper planting-season for older or larger plants; and which are also the only proper seasons for dividing or slipping the roots of all these kinds of plants for increase.

And for bulbous-rooted kinds, and all such tuberous roots whose leaves, like most of the bulbous tribe, decay in the summer, the proper season for planting or transplanting them is from May or June until the beginning or middle of August, when their flower-stalks decay, which in some sorts happens early, and some late, in the summer; but as soon as it happens in the different sorts, is the only proper

per time to remove all those kinds of plants when necessary, as also to separate their off-sets for increase; and which may either be planted again directly, or kept out of ground one, two, or several months, though it is proper to plant the principal part again in autumn, unless where any is to be retained for sale, or any particular occasion.

Succulent perennials may be transplanted almost any time from March or April until August or September, which is the best season for removing these kinds; and most kinds of succulent cuttings succeed best when planted in summer.

General Mode of arranging the Plants of this Department.

In the distribution of all the various sorts of plants in the Nursery, let each sort be separate: the fruit-trees should generally occupy spaces by themselves; the forest-trees, &c. should also be stationed together; all the shrub-kind should also be ranged in separate compartments; allot also a place for herbaceous perennials; a warm place should likewise be allotted the tender plants, and defended with yew or privet hedges, or a reed hedge, &c. in which compartments you may station all such plants that are a little tender whilst young, and require occasional shelter from frost, yet are not so tender as to require to be housed like green-house plants, &c. so that in such compartments there may also be frames of various sizes, either to be covered occasionally with glass-lights, or some with mats, to contain such of the more choice of the above tender kinds in pots, to be nursed up a year or two, or longer, with occasional shelter, till hardened gradually to bear the open air fully.

The arrangement of all the sorts in the open ground, must always be in lines or Nursery-rows, as we formerly observed, to stand till arrived at a proper growth for drawing off for the garden and plantations; placing the fruit-tree stocks, &c. for grafting and budding upon, in rows two feet asunder, if for dwarfs; but standards two feet and a half, and a foot and a half in the lines (see Stocks): though after being grafted and budded, they then commencing fruit-trees, &c. that if they are to stand to grow to any large size, they should be allowed the width of a yard between the rows. Forest-trees should also be placed in rows from two to three feet asunder, and half that distance in the rows; varying the distance both ways according to the time they are to stand: the shrub-kind should likewise be arranged in rows about two feet asunder, and fifteen or eighteen inches distant in each line; and as to herbaceous plants, they

should generally be disposed in four-feet-wide beds, or large borders, in rows, or distances from six to twelve or eighteen inches asunder, according to their nature of growth, and time they are to stand.

By the above arrangement of the various sorts of hardy trees, shrubs, and herbaceous plants, in rows at those small distances in the Nursery, a great number of plants are contained within a narrow compass, which is sufficient room, as they are only to remain a short time; and that by being thus stationed in a little compass, they are more readily kept under a proper regulation for the time they are to remain in this department.

But in the public Nurseries they often plant many kinds of seedling-trees and shrubs in much closer rows at first planting out, than the distances above prescribed, not only in order to husband the ground to the best advantage, but by standing closer, it encourages the stem to shoot more directly upward, and prevent them expanding themselves much any where but at top, as for instance, many sorts of ever-greens that are but of slow growth the first year or two, such as the pine-trees, firs, and several others; which the Nursery-gardeners often prick out from the seminary, first into four-feet-wide beds, in rows lengthways, six inches asunder; and after having one or two years growth here, transplant them in rows a foot asunder; and in a year or two after give them another, and final transplantation, in the Nursery, in rows two or three feet asunder, as observed above; and by these different transplantings, it will encourage the roots to branch out into many horizontal fibres, and prepare them better for final transplantation, which is the more particularly necessary in several of the pine and fir kinds, and several other ever-greens, as is more fully explained under their proper genera.

With respect to the different methods of planting the various sorts of Nursery-plants, after being raised either by seed, layers, cuttings, &c. it is performed in several ways to different sorts; some are pricked out by dibble, others are put in by the spade, either by trenches, sitting-in, trenching, or holing; and some are drilled in by a spade or hoe.

As to most of the tree and shrub-kind, sometimes the young seedling-trees and shrubs are pricked out from the seminary by dibble; sometimes they are put in by the spade in the following methods: first, having set a line to plant by, strike the spade into the ground with its back close to the line, and give another stroke at right angles with it; then set a plant into the crevice made at the second stroke.

bring it close up into the first made crevice even with the line, and press the mould close to it with the foot; then proceed to plant another in the same way, and so proceed till all is planted. A second method is for plants with rather larger roots: strike the spade down with its back close to the line, as aforesaid, and then with a spade cut out a narrow trench, close along the line, making the side next the line perfectly upright; then placing the plants upright against the back of the trench close to the line, at the proper distances, before mentioned; and as you go on, trim in the earth upon their roots: and when one row is thus planted, tread the earth gently all along close to the plants; and then proceed to plant another row. A second method of planting out small tree and shrub plants is, having set the line as above, then turning the spade edgeways to the line, cast out the earth of that spit, then a person being ready with plants, set one in the cavity close to the line, and directly taking another such spit, turn the earth in upon the roots of the plant, and then placing another plant into the second cut, cover its roots with the earth of a third spit, and so on to the end: but sometimes, when the roots are considerably larger, holes are made along by the line wide enough to receive the roots freely every way, so covering them in, as above, as you go on: observing always to press the earth gently with the foot close to the roots, and close about the stems, to settle the plants firmly in their proper position.

Herbaceous fibrous-rooted plants are, for the most part, planted with a dibble, except when the roots are large and spreading, or such as are removed with balls of earth; then they are more commonly planted by holing them in with a garden trowel, or small spade.

Bulbous and tuberous-rooted plants, such as lilies, tulips, anemones, ranunculuses, &c. are very commonly planted with a dibble, but many sorts may also be planted in drills drawn with a hoe, see DRILL-SOWING, &c. These sorts are also sometimes planted as follows: rake or trim the earth from off the top of the beds from about three to four or five inches deep, into the alleys, then place the roots in rows upon the surface, thrusting the bottom a little into the ground, and immediately cover them with the earth which was drawn off into the alleys for that purpose, spreading it evenly over every part, so as to bury all the roots an equal depth.

But as to the tender kinds of exotic plants that require occasional shelter whilst young, many of them should be potted, in order for

moving to a warm situation in winter, or some into frames, &c. to have occasional shelter from frost, by glassed or mats, as they shall require; hardening them, however, by degrees to bear the open air fully in the Nursery the year round.

And the most tender kinds that require the aid of a green-house and stove, must all be potted, and placed among the respective plants of those conservatories. See GREEN-HOUSE and STOVE PLANTS.

General Culture of the Plants of this Department.

With respect to the management of the various hardy Nursery-plants;—

Those designed as stocks for fruit-trees, should have their stems generally cleared from lateral shoots, so as to form a clean straight stem, but never to shorten the leading shoot, unless it is decayed, or becomes very crooked, in which case it may be proper to cut it down low in spring, and it will shoot out again; training the main shoot for a stem, with its top entire for the present, till grafted or budded; and as to the grafting and budding them, that work is fully directed under these articles, and their general method of training, whether for dwarfs or standards, is also particularly exhibited under those two heads, and in the respective genera of the various sorts.

But in the above Nursery culture of the fruit-tree kind, some sorts designed for principal wall-trees, such particularly as peaches, nectarines, apricots, &c. should, when of one year's growth from grafting and budding, be transplanted against some close fence in the Nursery, either a wall, paling, or reed-hedge, &c. and their first graft or bud-shoot headed down in the spring, to promote an emission of lower lateral shoots and branches, in order to be regularly trained to the fence in a spreading manner for two or three years' or more, or till wanted, whereby to form the head in a regular spreading growth for the intended purpose of garden wall-trees, which in the public Nurseries in particular, should always be ready in proper training to supply those who may wish to have their walls covered as soon as possible by means of such ready trained trees.

A similar training, both for wall and espalier-fruit-trees, may be practised to some principal sorts in the Nursery-rows in the open quarters of ground, by arranging their branches, in a spreading manner, to stakes placed for that purpose.

But for standard fruit-trees they should be trained with a clean single stem, five or six feet for full standards, by cutting off all lateral shoots

shoots arising below: half standards trained with a three or four feet stem, and dwarf standards in proportion by the same means, and as to the heads of the standards, it may be proper, in some, to have the first immediate shoots from the graft or bud when a year old, pruned short in spring, to procure several laterals, in order to form a fuller spread of branches, proceeding regularly together from near the summit of the stem, that the head may advance in a more regular branchy growth.

Forest trees, in general, should be encouraged to form straight clean single stems, by occasional trimming off the largest lateral branches, which will also promote the leading top-shoot in aspiring straight, and faster in height; always suffering that part of each tree to shoot at full length, that is not to top it, unless, however, where the stem divides into forks, to trim off the weakest, and leave the straightest and strongest shoot or branch, to shoot out at its proper length to form the aspiring top, as above.

The different sorts of shrubs may either be suffered to branch out in their own natural way, except just regulating very disorderly growths; or some may be trained with single clean stems, from about a foot to two or three high, according as you shall think proper with respect to the sorts or purposes for which you design them in the shrubbery; but many shrubs appear the most agreeable when permitted to shoot out laterally all the way, so as to be branchy or feathered to the bottom.

All the fruit-trees, as soon as grafted or budded, should each species have all its different varieties numbered by placing large flat-sided sticks at the ends of the rows, for which purpose many of the London Nurserymen use the spokes of old coach-wheels, or any thing about that size of any durable wood, painting or marking the numbers thereon, 1, 2, 3, &c. to different sticks, entering the numbers in the Nursery-book, with the name of the varieties to which the number-sticks are placed; whereby you can at all times readily have recourse to the sorts wanted.

The same method may be practised to any other trees, shrubs, or herbaceous plants, especially the varieties of particular species, when they are numerous, such as in many of the flowery-tribe, as auriculas, carnations, tulips, anemones, ranunculuses, and the like.

With respect to watering the Nursery-plants; this may be very requisite in dry hot weather in spring and summer, to seed-beds and tender seedling-plants, while young, and when first

planted out, till they have taken good root; also occasionally to new-layed layers, and newly-planted cuttings in dry warm weather; but as to hardy trees and shrubs of all sorts, if planted out at the proper time, that is, not too late in spring, no great regard need be paid to watering, for they will generally succeed very well without any: indeed, where there is but a few, you may, if you please, water them occasionally, if it proves a very dry spring in April and May; but where there are great plantations it would be an almost insupportable fatigue, and great expense; as in many public Nurseries, where they each winter or spring plant out fifty or sixty thousand trees and shrubs, and in some double those numbers.

Every winter or spring, the ground between the rows of all sorts of transplanted plants in the open Nursery-quarters must be digged; this is particularly necessary to all the tree and shrub-kinds that stand wide enough in rows to admit the spade between; which work is by the Nursery-men called *turning-in*; the most general season for which work is any time from October or November until March; but the sooner it is done the more advantageous it will prove to the plants. The ground is to be digged but one spade deep, proceeding row by row, turning the top of each spit clean to the bottom, that all weeds on the top may be buried a proper depth to rot: this work of *turning-in* is a most necessary annual operation, both to destroy weeds, and to increase the growth of the young Nursery-plants.

In summer be remarkably attentive to keep all sorts clean from weeds; the seedlings growing close in the seminary-beds must be hand-weeded; but among plants of all sorts that grow in rows wide enough to introduce an hoe, this will prove not only the most expeditious method of destroying weeds, but by loosening the top of the soil, it will prove good culture in promoting the growth of all kinds of plants: always perform this work of hoeing in dry weather, in due time before the weeds grow large, and you may soon go over a large space of ground, either with a common drawing-hoe, or occasionally with a scuffling hoe, as you shall find the most convenient. See HOE and HOEING.

According as any quarter or compartment of the Nursery-ground is cleared from plants, others must be substituted in their room from the seminary; but the ground should previously be trenched and lie some time fallow, to recruit or recover its former vigour; giving it also the addition of manure, if it shall seem proper; and after being trenched in ridges, and having the repose only of one winter, or summer,

summer, or a year at most, it will sufficiently recover its vegetative force, and may be planted afresh.

It will be of advantage to plant the ground with plants of a different kind from those which occupied it before.

The tender or exotic plants of all kinds that require shelter only from frost, whilst young, as we formerly mentioned, and by degrees become hardy enough to live in the open air; should, such of them as are seedlings in the open ground, have the beds arched over with hoops, or rods, at the approach of winter, in order to be sheltered with mats in severe weather; and those which are in pots, either seedlings or transplanted plants, should be removed in October in their pots to a warm sunny situation sheltered with hedges, &c. placing some close under the fences facing the sun, where they may have occasional covering of mats in frosty weather; others that are more tender may be placed in frames, to have occasional covering either of glass-lights or mats, &c. from frost; observing of all those sorts here alluded to, that they are gradually to be hardened to the open ground, and need only be covered in frosty weather; at all other times let them remain fully exposed, and by degrees, as they acquire age and strength, inure them to bear the open air fully; so as, when they arrive at from two or three to four or five years old, they may be turned out into the open ground. The sorts requiring this treatment, are always pointed out under their proper heads, in their respective genera.

The green-house kinds of all sorts, or such as require constant shelter in winter, are to be managed as directed under the article GREEN-HOUSE PLANTS.

And the hot-house or stove-plants, or such as require constant shelter all the year, together with the aid of artificial heat, are to be managed as exhibited under the article STOVE PLANTS.

NYCTANTHES, Arabian Jasmine.

This genus consists of shrubby, ever-green, very flowery exotics of the Indies, for the stove collection; rising with shrubby durable stems, branching ten or twelve feet high; adorned with heart-shaped, oval, and spear-shaped, entire leaves, and numerous monopetalous, hypocrateriform, eight-parted, white, very fragrant flowers in clusters at the sides and ends of the branches.

Class and order, *Diandria Monogynia*.

Characters.] CALYX is monophyllous, acutely eight-parted, and permanent. COROLLA is monopetalous, hypocrateriform, or saucer-shaped, with a cylindric tube, di-

vided above into eight plane spreading segments. STAMINA, two small subulate filaments, and acute erect antheræ. PISTILLUM, a roundish depressed germen, simple style, and two erect stigmas. PERICARPIUM, an emarginated bilocular capsule having a solitary seed.

The species are,

1. NYCTANTHES *Sambac*.

Sambac, or Common Arabian Jasmine.] Hath a shrubby, weak stem, branching, straggling, and numerous mounting upon support ten or twelve feet high, or more; heart-shaped obtuse leaves below, and oval acute ones above, about three inches long and one broad, placed by pairs opposite; and from the upper axillas and ends of the branches clusters of pure white, very fragrant flowers great part of the year.

Variety.] Double-flowered, or Grand Duke of Tuscany's Jasmine, most large and beautiful—striped flowered.

This species, &c. is also inserted in the genus *Jasminum* by mistake, to which its flowers are very similar, but larger.

2. NYCTANTHES *undulata*.

Undulate-leaved Malabar Jasmine.] Hath a shrubby stem, branching eight or ten feet high; having branches; oval cylindric-spear-shaped, undulate, or waved smooth leaves, by pairs opposite; and at the axillas small clusters of large snowy-white, sweet-scented flowers.

3. NYCTANTHES, *Arbor tristis*.

Arbor tristis, or Sorrowful-tree.] Hath a shrubby, tetragonous, or square stem, branching numerous twelve or fifteen feet high; oval, acute-pointed, opposite leaves, and at the axillas clusters of white, very fragrant flowers, opening at night, and often withering in the morning, or at the approach of the full sun.

From the circumstance of the flowers of this tree, in its native soil, opening in the evening, and fading at the approach of morning, assuming a withered, drooping appearance in the day-time, it obtained the name *Arbor tristis, or Sorrowful-tree*.

4. NYCTANTHES *hirsuta*.

Hairy Sorrowful-tree.] Hath a shrubby stem, branching twelve or fifteen feet high; oval, smooth, shining-green leaves, placed irregularly, having hairy foot-stalks; and at the axillas clusters of white flowers, on hairy pedunculi, opening on nights, and fade next morning.

These shrubs are beautiful ever-greens, and flower here in our stoves annually; are exceedingly floriferous, and make a fine appearance,

ance, generally in the hot summer months, and some great part of the year in succession: the flowers all monopetalous, tubulous below, eight-parted and spreading above, bearing a very near resemblance to those of the common white jasmine, but larger and more divided, and of a higher fragrance, which is somewhat like that of orange-flowers.

The plants are tender exotics from the hot parts of India, &c. and require a hot-house in this country; so must be kept always in pots of rich earth, and placed constantly in that department, except about a month or two in the heat of summer, when, if thought proper, they may be set abroad; being careful, however, to remove them into the stove again early in September.

Their Propagation, &c.

Their propagation is by layers and cuttings, also sometimes by grafting.

The layers and cuttings must be of the young shoots, and spring, or the early part of summer, is the proper season for performing the work, which is to be effected in the usual way: observing, that if the pots containing the layers and cuttings are plunged in the bark-bed, it will forward their rooting exceedingly; each plant is afterwards to be potted separately, and plunged also in the bark-bed in the stove.

The propagation by grafting is sometimes practised upon stocks of the common white Jasmine, in the usual method, in spring: observing not to suffer any shoots to grow from the stock below the graft; training the main shoot from the graft, a foot or two high to form a stem; then encourage it to branch out to form a head.

Let the plants have a due supply of water all the year; and if they grow luxuriant, prune them as you shall see convenient; and shift them into larger pots occasionally.

NYMPHÆA, (Nymphaea) Water-Lily.

The plants are herbaceous, very showery perennials of the aquatic tribe, consisting of three species, two of which are inhabitants of our rivers and brooks; but sometimes cultivated in canals, ponds, &c. of gardens, for ornament, and have a beautiful effect: they having large knotty roots, sending up very large roundish heart-shaped leaves on long footstalks, and float on the surface of the water; and between them very large polypetalous flowers, on very long pedunculi, and show themselves also just above the surface of the water, singularly curious and ornamental.

Class and order, *Polyandria Monogynia.*

Character.] CALYX, four large, coloured, permanent leaves. COROLLA, many pe-

tals (generally about fifteen) sitting on the germen, usually in more than a single series. STAMINA, numerous, short, crooked filaments, and oblong antheræ affixed to their sides. PISTILLUM, a large oval germen; no style, but an orbicular, plane target-shaped, close-fitting, crenated, permanent stigma. PERICARPIMUM, a large oval, fleshy, hardy, rude, multilocular bacca, crowned at top, and filled with many roundish seeds.

The most noted species are:

1. *NYMPHÆA lutea.*

Yellow Nymphaea.] Hath a large, knotty, spongy, deeply-striking root; very large, roundish-heart-shaped, flat-expanded, entire leaves; and large yellow flowers, having a pentaphyllous calyx, larger than the petals.

2. *NYMPHÆA alba.*

White Nymphaea.] Hath a large, knotty, spongy, deeply-penetrating root; large, roundish-heart-shaped, flat-expanded, entire leaves; and large, white, sweet-scented flowers, having a quadrifid calyx.

3. *NYMPHÆA Nolumbo.*

(*Nolumbo*)—or *Indian Water-Lily of Ceylon, &c.*] Hath a large, knotty, deeply-striking, fleshy root, producing large, round-peltated, or target-shaped leaves; perfectly entire and smooth, expanding flat on the surface of the water; and large flesh-coloured flowers, of numerous petals, disposed in two or more series.

The two first species flower in June and July; the flowers are very large and conspicuous, beautifully showing themselves on the surface of the water.

The plants are perennial in root, which strikes deep into the sand, gravel, or mud at the bottom of the water, from which arise their leaves and flowers annually, elevated to the top of the water, on long foot-stalks, where they float, and just appear on the surface; the leaves generally coming up in April or May, and the flowers in June and July; succeeded by their large oval pericarpiums, filled with black shining seeds, ripening in the end of August, or in September; when being discharged from their cells, they sink to the bottom of the water, where they germinate in spring following, and young plants soon appear at top; so that the plants thus multiplying each year, and the roots of each year's plants abiding and multiplying by off-sets, they soon spread over a large space of water.

Their Propagation.

The propagation of these plants in gardens is by seed cast into any piece of water where you intend they shall grow. To obtain the seeds, you must have recourse in autumn to the places where the plants grow naturally.

and

and watch the ripening of the seed-vessels, gather a quantity just as they begin to open, which cast into the water; the seeds will sink, and the plants will appear at top in spring after, and some of which will probably flower the ensuing summer, though it is generally the second year before they flower in perfection.

They being once thus raised, they will be of many years duration, and multiply greatly, so as to cover the whole surface of the water with their leaves and flowers in summer; so that only some particular pieces of water should be allotted for this purpose.

The third species of *Nymphæa* being a native of India, requires the protection of a green-house; it is propagated by seeds sown in a large tub, or cistern of water; having a foot or more earth in the bottom for the seeds to strike root into; so that the whole can be readily removed into shelter in autumn.

NYSSA, Tupelo Tree.

A curious aquatic tree of America, retained in our ornamental plantations and shrubberies, deciduous, and of moderate growth, adorned with simple leaves, of ornamental appearance, and polygamious apetalous flowers in clusters and singly in the different varieties.

Class and order, *Polygamia Diœcia*.

Characters.] *Males.* CALYX, a perianthium, divided into five spreading segments. COROLLA, none. STAMINA, ten awl-shaped filaments, shorter than the calyx, and didymous or twin-antheræ. *Hermaphrodites.* CALYX and COROLLA, the same as in the males. STAMINA, five awl-shaped filaments, with single antheræ. PISTILLUM, an oval germen under the receptacle, subulated, incurved style, longer than the stamina, and an acute stigma. PERICARPIUM, an oval drupaceous fruit, or seed-vessel, of one cell, containing an oval acute nut.

The species is,

NYSSA aquatica.

Aquatic or Water Tupelo-tree.] Rises with

an upright even stem; eighteen or twenty feet high, terminating in a branchy head, garnished with spear-shaped, thick, soft, light-green leaves, generally on long foot-stalks, and placed alternately; appearing very ornamental all summer, and continue their fine light-green colour till late in autumn.

Varieties.] Intire-leaved—ferrated leaved—multiflorous, or flowers in clusters—solitary flowered.

This curious aquatic tree is originally from North America, delights in a moist soil, which it affects in the place of its native growth, in somewhat watery situations; but it prospers in our plantations in any common moderately moist ground.

The different varieties are proper to introduce in shrubberies, &c. generally allot them a sheltered moist situation; they will grow freely, and effect an ornamental diversity.

The propagation of the different varieties is by seed, suckers, layers, cuttings; the seed is imported here from America, generally in the spring, and, being procured, should be sown as soon as possible, either in a sheltered moist bed in the full ground, or in large pots; or, as the seeds do not always vegetate the first year, they may be sown in pots; and plunged into some naturally moist ground, screening them from frost in winter: the spring following, plunge the pots in a hot-bed, which will then quickly vegetate the seeds, and the plants will soon rise, when allow them a tolerable share of free air; to which inure them by degrees, till autumn; then, in October or November, placed in a green-house or garden-frame, for the winter; and, in spring, when of one or two years growth, plant them off separately in small pots, giving shelter another winter or two, or longer, they may then be transplanted into the full ground, in a defended, moist situation.

The propagation by suckers, layers, and cuttings, may be practised in the spring or autumn, in the common methods.

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OCYUM, (*Basilicum*) Basil.

The plants are mostly herbaceous, tender aromatic annuals, of branchy growth, proper for culinary and medical uses, and for

adorning the pleasure garden; obtaining in stature, some half a yard, others little more than half a foot; closely garnished with oval and oblong simple leaves; and the stems and branches

branches terminated by spikes of small monopetalous ringent flowers.

Class and order, *Didynamia Gymnospermia*.

Characters.] CALYX is monophyllous, bilabiated and permanent, the upper lip bifid, and the under acutely four-parted. COROLLA is monopetalous, ringent, and inverted, with a short spreading tube, and with the rising lip broadest, cut into four obtuse parts; the other is long, narrow, and undivided. STAMINA, two long and two short declinated filaments, and half-moon-shaped antheræ. PISTILLUM, a four-parted germen, slender style, and bifid stigma. PERICARPIUM, none; four naked seeds lodged in the calyx.

There are seven or eight species, but the most noted species in our gardens are the three following: each of which comprises many varieties; all remarkable for their strong odorous scent, and are all of a tender quality, requiring to be raised and forwarded in a hot-bed.

1. OCYUM Bafilicum.

(*Bafilicum*)—or *Common Sweet Basil*.]

Rises with an upright, square, hairy stem, branching by pairs, from about ten inches to half a yard high; garnished with large, oval, smooth, opposite leaves; and the main stem and all the branches terminated by spikes of small whitish flowers, having ciliated calyxes.

Varieties of this.] Broad-leaved *Basilicum*—narrow-leaved—fringed-leaved—fringed purple-leaved—curled-leaved—studded-leaved—large purple-leaved—dark-green-leaved—tricolor-leaved—red-flowered—purple-flowered—long-spiked—short-spiked, &c.

These different varieties have a piercing aromatic scent, some like cloves, others like citron, and some like fennel; they are good for culinary uses, in soup, &c. also for medical purposes; and the plants are employed for embellishing the pleasure-garden.

2. OCYUM minimum.

Least Ocymum, commonly called *Bush Basil*.] Rises with a very short stem, branching all around from the bottom, about six or eight inches high, forming a round bushy head; small oval very entire leaves, by pairs opposite; and the branches terminated by whorls of very small whitish flowers.

Varieties.] With hoary leaves—dark-purple-leaved—variable-leaved.

This species and varieties are much cultivated about London, in pots to carry to market, for ornamenting balconies, windows, &c. in summer.

3. OCYUM tenuiflorum.

Small-flowered China Basil.] Rises with an upright, taper, purplish stem, branching a foot and a half high; oval-oblong, serrated

leaves; and the main stem and branches terminated each by three slender spikes of exceedingly small flowers, having heart-shaped, concave, reflexed bractæa.

Varieties.] With white flowers—purple flowers.

All these three species of *Ocymum*, and their respective varieties, are of the annual-tribe, rising from seed in spring, flower in June and July, and ripen seeds in September, and totally perish at the approach of winter; so that a fresh supply must be raised from seed annually in spring. See their *Propagation*.

The flowers are small ringent hermaphrodites, collected into slender spikes of but little appearance.

All the species and varieties are accounted the strongest aromatics in nature, and, for the general part, the odour is very agreeable; though to some persons it is rather too powerful.

They are all exotics from India and other distant warm countries, and in these parts require to be raised and forwarded in hot-beds, as above observed, from March or April until towards the latter end of May or beginning of June, according to the temperature of the season; then may be fully exposed for the remainder of the summer.

With respect to their particular merit for our gardens, the common sort *Ocymum Bafilicum*, and varieties, may be employed as culinary aromatics in the kitchen-garden; and some of all the three species, &c. as ornamental plants for the pleasure-ground, both in the open compartments, and some in pots, in order for adorning court-yards, and to place in room-windows for their sweet odour, particularly the *Bush-Basil*.

Their Propagation, &c.

The propagation of all the three species is by seed annually, in spring, in a hot-bed, and from which they are transplanted into the open ground, &c. in May or June.

March and beginning of April is the proper season for sowing them. Having a moderate hot-bed under a frame and glasses, earthed five or six inches depth of light mould; sow the seed a quarter of an inch deep; they will come up in a few days; observing to indulge them with fresh air daily, and occasional very moderate waterings; and when the plants are an inch or two high, prick some of them upon the same or another new hot-bed, three or four inches asunder; or plant some singly in small pots, and plunge them in the hot-bed, give water as soon as planted, together with occasional shading from the sun till fresh-rooted; continuing the admission of fresh air daily, and repetitions of light refreshments of water:

water: in May harden them by degrees to the full air; and about the middle or latter end of the month, or beginning of June, in warm moist weather, remove them into the open air, finally to remain, taking them up with balls about their roots, and plant some in the borders, others in larger pots, to move where occasionally wanted; give water directly, and at times, till they have taken fresh root, which they will soon effect, and arrive to their full growth in June and July, when they will flower, and ripen seeds in September.

To obtain more effectually some good seeds of those plants in this country, it is advisable to move some in their pots in August into a glass-case, or garden-frame, to be sheltered in cold weather, and from excessive wet; but admitting the free air in fine weather, and they will thus ripen seeds in tolerable plenty.

OCTANDRIA, the name of the eighth class in the botanic system: plants with hermaphrodite flowers, having eight stamina; and consists of four orders, according to the number of styles. See CLASSIS.

ÆNOTHERA, Tree-Primrose.

This genus of plants consists of hardy herbaceous biennials and perennials, and under-shrubby perennials; all of the flowery tribe, for the decoration of the pleasure-garden: rising with upright firm stems, from one foot to three or four high, in different sorts, garnished with largish oval and spear-shaped leaves; and from the axillas on every side large, quadripetalous, primrose-shaped, yellow flowers, of considerable appearance; from June or July until October.

Class and order, *Octandria Monogynia*.

Characters.] CALYX is monophyllous, long, tubular, divided at the brim into four acute reflexed segments, and is deciduous. COROLLA, tubulous below, of four heart-shaped, plane petals, inserted into the divisions of the calyx. STAMINA, eight awl-shaped, crooked filaments, terminated by oblong incumbent antheræ. PISTILLUM, a cylindric germen under the calyx, filiform style, and a thick, quadrifid, obtuse, reflexed stigma. PERICARPIUM, a cylindric, tetragonous, quadrilocular, quadrivalved capsule, containing many small angular seeds.

The most remarkable species of this genus in the English gardens are:

1. ÆNOTHERA biennis.

Biennial Common Tree-Primrose.] Hath a long, thick, deeply-striking root, crowned with many large, oval-spear-shaped, plane, spreading leaves; upright, thick, firm, rough, hairy stems, rising three or four feet high, garnished with long, narrow, lanceolate, close-

sitting leaves, irregularly; and at all the axillas, from the middle upwards, large bright-yellow flowers.

2. ÆNOTHERA ovalvis.

Ovalvis, Smooth, Biennial Tree-Primrose.] Hath upright, firm, somewhat hairy stems, rising a yard high; oblong, spear-shaped, pointed, plane, smooth leaves; and at the axillas large bright-yellow flowers.

3. ÆNOTHERA fruticosa.

Shrubby, Narrow-leaved, Perennial Tree-Primrose.] Hath long thick roots; upright, under-shrubby-like, red stems, two or three feet high; spear-shaped, slightly-indented leaves; and at the axillas pedunculated clusters of yellow flowers; succeeded by pedicellated, acute-angled capsules.

4. ÆNOTHERA pumila.

Low Perennial Tree-Primrose.] Hath fibrous roots, crowned with many oval-spear-shaped, close-sitting leaves; slender-herbaceous stems, ten or twelve inches long, garnished with spear-shaped, blunt, smooth leaves, having very short foot-stalks; and at the axillas small bright-yellow flowers; succeeded by acute-angled capsules.

5. ÆNOTHERA longiflora.

Long-flowered Tree-Primrose.] Rises with a simple, hairy-stem, garnished with oblong denticulated leaves, and long-tubed flowers, having the petals distant, and two-lobed.

All these plants flower very profusely in June and July, coming out almost half the length of the stalks from the axillas; and as the stalk advances in stature, new flowers are produced, succeeding those below; in which order the plants continue flowering from about Midsummer until October; each flower is moderately large and conspicuous, consisting of four plane petals, which with the calyx forms a very long tube below, and spreading above, generally expanding most towards the evening; and are succeeded by plenty of seed in autumn for propagation.

These plants are exotics originally from America, but are all very hardy, prosper in any common soil and situation, and have been long in the English gardens, especially the first three sorts, but the *Ænothera biennis* is the most commonly known.

The first and second species are biennial, and the third, fourth, and fifth are perennial in root.

They are proper to be employed as plants of ornament for embellishing the pleasure-garden; they may be placed any where, and will effect a very agreeable variety three or four months with their plentiful blow of flowers.

The biennial kinds must be raised annually from

from seed, for they mostly perish soon after they have flowered.

But the perennials, once raised, continue for years by the root.

Their Propagation.

The propagation of all the sorts is by seed, and the perennials also by parting the roots.

By Seed.—By this method both biennials and perennials may be raised plentifully in any bed or border of common earth. Sow the seed either in autumn or early in spring; the autumnal sowings will rise strong betimes in the spring, but may be sown successfully in either season. In May or June, when the plants are two or three inches high, thin them where too close; at the same time plant out a quantity in nursery-rows six inches asunder; give occasional weeding, and plenty of water in dry weather; and in autumn they may be taken up with balls of earth about their roots, and planted where they are finally to remain.

By Parting the roots.—The perennials in particular being abiding, and multiplying by off-sets of the roots, they may be propagated by dividing the roots into slips, in autumn or spring; each slip becomes a proper plant, producing flowers the following summer.

Or, however, if any of the biennial kinds afford young off-sets below, in autumn, &c. they may be slipped off, and planted as the others; or occasionally some old plants in the first year of flowering, having the stems cut down soon in Autumn, at the decaying of the flowers, it sometimes promoting a bottom growth, they continue a year or two longer in a flowering state.

OFF-SETS, a sort of suckers, or small young plants, issuing from the sides of the main roots of many sorts of perennials, both bulbous, tuberous, and fibrous-rooted kinds, by which vast numbers of the respective plants are propagated, as each Off-set becomes a proper plant, alike in every respect to the parent.

Off sets are applicable to the general propagation of all sorts of bulbous and tuberous-rooted perennials, such as tulips, anemones, &c. the Off-sets of which are small bulbs and tubers; and as most of the bulbous and tuberous-rooted tribe send forth plenty of Off-set roots from the sides of the main ones annually, it is a certain, easy, and expeditious method of propagating all these kinds of plants, and each Off-set commences a new plant, producing stalks, leaves, flowers, fruit, &c. exactly like those of the parent plant; so that having some roots of any particular approved species and varieties, you may increase them annually by the Off-sets, and which, after hav-

ing one or two years' growth, will flower, produce seed, and furnish a supply of Off-sets in their turn: all still continuing the same as the mother plant in every mode of growth.

Likewise, in the vast tribe of fibrous-rooted perennials, most sorts afford a progeny of Off-sets, less or more, for propagating and perpetuating their respective species and varieties, both principally in the flowery kind, &c. and in some esculents, but considerably more general in the former; and by which numerous sorts of our most beautiful flowering perennials are multiplied, some more abundantly, others more sparingly; and each Off-set becomes a distinct plant the same in its general growth, flowers, &c. as the parent.

So that Off-sets are not only an expeditious certain method of propagation, but by which we are sure of having the desired sorts, either species or any particular varieties, continued invariably the same.

Off-sets, in the article of propagation, have this particular advantage over seedlings, that those of the flowery kind will often flower in one year; whereas seedling plants of the bulbous kinds are frequently four, five, and sometimes six or seven years before they flower in perfection; so that seedlings are principally to gain new varieties; and the roots of which furnishing Off-sets, the varieties are increased.

As to the mode of separating Off-sets, it may be done in some sorts every year, in others once in two or three years, according to the sorts, and the increase of Off-sets the main roots shall afford; which is always explained in the culture of the respective sorts, under their proper genera.

The proper season for separating Off-sets is in the bulbous and many tuberous-rooted plants, chiefly summer and autumn, when they have done flowering, and the leaves decay; for at that period, the roots of these sorts having had their full growth for that season, they assume an inactive state of growth, not drawing any nourishment from the earth: they continuing at rest, however, but a few weeks, attention must be had to take the opportunity of that interval, before they put out new fibres; which is the only proper period for moving all the bulbous kinds in particular, both to separate the Off-sets, and for transplanting the main roots, or for taking them up for keeping for a month or two, or longer. See *BULBUS*. Observing therefore the proper time, and having taken up the roots, in dry weather if possible, let all the Off-sets be separated singly from the main bulb, &c. and plant the Off-sets in nursery-beds, in

rows six inches asunder, by dibble or in drills, two or three inches deep; and here let them remain a year or two, according to their size, to get strength; then transplant them, at the proper season, where they are to continue, managing them as other bulbous and tuberous-rooted plants. See *BULBUS*, *RADIX*, &c.

But with respect to Off-sets of fibrous-rooted perennials, you may either slip off the principal ones from the sides of the main root, as they stand in the ground, or the root may be wholly taken up, and parted into as many slips as there are Off-sets furnished with fibres. The proper season for this is autumn, when their stalks decay, or early in spring, before new ones begin to shoot forth; though some hardy sorts may be slipped any time in open weather from September or October, until February, March or April: and some sorts almost any time when they occur; planting them by dibble, the smaller Off-sets or slips in nursery-beds, in rows six or eight inches asunder, to have a year's growth; and the larger ones may be planted at once where they to remain, and they will flower the ensuing season.

Several sorts of under-shrubby perennials increase also by Off-sets at bottom; and the proper season for taking them off is autumn and spring; or in hardy kinds it might be done any time in open weather, from October until March; planting them in nursery-rows for a year or two, or till of proper size for the purposes for which they are designed.

Off-sets of succulent plants should generally be slipped off in summer; and previous to planting those of the tender kinds, should be laid on a dry shelf for some days, till the moisture at bottom is dried up; then planted in pots of dry soil, and managed according to their different temperatures. See *SUCCULENT PLANTS*. No Off-sets are ever to be expected from annual plants.

OLEA, Olive-tree.

This genus consists of three ever-green exotic-trees for the green-house collection; generally assuming a shrubby-like growth, by rising frequently with several stems from the bottom, branching laterally all the way; one sort obtaining in stature twenty or thirty feet high, the others but six or seven feet; garnished with spear-shaped and oval stiff leaves, and clusters of funnel-shaped flowers from the axillas; succeeded by that well-known oval fruit called olives, in great estimation abroad for making oil, and for pickling, &c. but in this country the plants are retained principally for variety, as the fruit rarely attains due perfection.

Class and order, *Diandria Monogynia*.

Characters.] *CALYX* is small, monophyllous, tubulous, quadridented, and deciduous. *COROLLA* is monopetalous, infundibuliform, with the top quadripartite and spreading. *STAMINA*, two short filaments, and erect antheræ. *PISTILLUM*, a roundish germen, short style, and thick bifid stigma. *PERICARPIUM*, a suboval, smooth, unilocular, drupaceous fruit, including an oblong-oval nut.

The species are,

1. *OLEA europæa*.

European Common Olive-tree.] Rises with upright solid stems, branching numerously on every side, twenty or thirty feet high; spear-shaped, stiff, opposite leaves, two or three inches long, and half an inch or more broad; and at the axillas small clusters of white flowers, succeeded by oval fruit.

Varieties.] Narrow-leaved—broad-leaved Spanish—short hard-leaved—shining-leaved African.

This species is the principal sort cultivated abroad for its fruit; the varieties of which are numerous, varying in size, colour, and quality.

It is a native of the southern warm parts of Europe, and is cultivated in great quantities in the south of France, Italy, and Portugal, for the fruit to make the Olive-oil, which is in so great repute, and is transported to all parts, to the great advantage of those countries where the trees grow in the open ground: the green fruit is also in much esteem for pickling, of which we may see plenty in the shops.

2. *OLEA capensis*.

Cape Box-leaved Olive.] Rises with shrubby stems, branching numerously from the bottom, six or seven feet high; small, oval, thick, stiff, shining leaves; and at the axillas small clusters of whitish flowers; succeeded by small fruit of inferior value.

3. *OLEA fragrans*.

Sweet-scented Chinese Olive.] Rises with shrubby branching stems, three or four feet high, garnished with serrated spear-shaped leaves, and clusters of small whitish sweet-scented flowers, which, it is supposed, are used by the Chinese, with some others, to give scent and flavour to the tea.

These plants, in this country, are cultivated principally for variety, and for which, a tree or two of each in a garden may be sufficient; especially as they must be kept principally in pots for moving to shelter of a green-house in winter; for they are too tender to prosper well in the open ground here; though sometimes they are planted against a warm south wall, and sheltered occasionally from frost

in

in winter, by mulching the roots, and matting their tops; whereby they may be preserved, and will sometimes produce fruit for pickling; a very severe winter, however, often kills or greatly injures their young branches; therefore let the principal part be potted in rich earth, and placed among the green-house shrubs, and managed as directed in the article GREEN-HOUSE PLANTS.

These trees are often sent over from Italy to the Italian warehouses in London, along with orange trees, &c. where pretty large plants may be purchased reasonably, which should be managed as directed for orange-trees that are imported from the same country. See CITRUS.

Their propagation here is commonly by layers.

The laying is performed on the young branches in spring; give plenty of water all summer and they will sometimes be rooted fit for potting off by autumn; but sometimes they require two summers to be rooted effectually: when, however, they are properly rooted, take them off early in autumn, and pot them separately, give water, and place them in some shady place till they have taken fresh root; and in October remove them into the green-house, &c.

Those you intend to plant in the open-ground, as before suggested, should be kept in pots, in order to have occasional shelter of a garden-frame two or three years, till they have acquired some size, and are hardened to the full air; then transplant them into a warm border against a south wall; mulch their roots in winter, and mat their tops in frosty weather.

OLDENLANDIA, consists of an annual stove-plant, garnished with spear-shaped leaves, and corymbose flowers.

Class and order, *Tetrandia Monogynia*.

Characters.] CALYX, a four-parted persistent cup. COROLLA, monopetalous, tube cylindric, and border four-parted, acute, and spreading. STAMINA, four filaments within the tube, and topped with small antheræ. PISTILLUM, a roundish germen below the flower, style single, and crowned with a bifid, obtuse stigma. PERICARPIUM, a roundish, twin capsule, with two cells, containing many small seeds.

There is but one species.

OLDENLANDIA *corymbosa*.

Corymbous-flowering Oldenlandia.] A low annual plant, with many branches, garnished with small linear-lanceolate leaves, placed opposite; the flower-stalk is a multiflorous peduncle, producing a corymbus of white flowers.

The propagation of this plant is by seeds sown early in the spring, on a hot-bed, and when come up, transplanted on another in small pots, and may be removed afterwards into the stove, where they will flower all the summer; or the seeds may be sown when ripe, and the plants retained in the stove during the winter, to produce an early bloom.

ONONIS, Rest-Harrow.

It consists of hardy herbaceous perennials and annuals, and some shrubby plants; several of the former are very troublesome weeds in the fields, and some of the latter are proper for ornamenting the pleasure-ground; most of the sorts grow erect from about one foot to two or three high; garnished some with simple, others with trifoliate leaves; and papilionaceous flowers.

Class and order, *Diadelphia Decandria*.

Characters.] CALYX is divided into five narrow arched segments, the lower ones bending under the carina. COROLLA is papilionaceous, the standard heart-shaped, and depressed on the sides, short oval wings, and a pointed carina. STAMINA, ten diadelphous filaments, and simple antheræ. PISTILLUM, an oblong hairy germen, simple style, and obtuse stigma. PERICARPIUM, a turgid, unilocular, bivalved pod, having kidney-shaped seeds.

There are many species, several of which are common weeds, often very troublesome in the fields, their roots spreading widely around, and are so tough and strong, as sometimes to retard the progress of the husbandman's harrow; whence originated the English name, Rest-harrow.

The most material species common to the gardens, are the following shrubby kinds:

1. ONONIS *fruticosa*.

Shrubby Purple Rest-harrow.] Rises with slender, shrubby, durable stems, branching numerously two or three feet high; spear-shaped, serrated, ternate leaves; and all the branches terminated by panicles of large red flowers, three on each pedunculi.

2. ONONIS *tridentata*.

Tridented Shrubby Rest-harrow.] Rises with shrubby, slender stems, branching half a yard high; narrow, fleshy, ternate leaves, tridented at the top; and the branches terminated by panicles of purple flowers, two on each pedunculi.

Both these shrubs flower very ornamentally in May or June, the flowers are papilionaceous or butterfly-shaped, large and conspicuous, and are succeeded by ripe seeds in autumn.

The first sort is very hardy, and proper for the shrubbery.

The

The second requires shelter from frost, so should generally be kept in pots, in order for moving to a green-house or garden-frame in winter.

Their propagation is by seed, sown in April in a warm border, half an inch deep; or if those of the second sort are sown in pots and plunged in a slender hot-bed, they will more certainly succeed; the plants will come up in May; give plenty of water all summer, and indulge the second sort with shelter in winter; in spring plant out both sorts; the first in nursery-rows a foot asunder, to remain a year or two, when they will be fit for the shrubbery; and the second plant in pots for moving to shelter in autumn.

OPHIOXYLON (*ophioxylon*.)

One shrubby, serpentinous climber of India for our stove collections, producing polygamious monœcious flowers.

Class and order, *Polygamia Monœcia*.

The species is,

OPHIOXYLON *serpentinum*.

Serpentinous Ceylon Ophioxylon.] Stem climbing; leaves spear-shaped, ternate, and quaternate.

This plant is propagated by layers, cuttings, and seed forwarded in a bark-bed, and requires to be always continued in the stove.

OPHRYS, Twyblade, Bee-flower, &c.

This genus is composed of herbaceous, bulbo-fibrous-rooted perennials, mostly inhabitants of our woods, pastures, meadows, and some hilly grounds, but frequently employed in the pleasure-garden for the singularity of their flowers; most of them are low plants, with erect annual stalks, from three or four inches to a foot high; some naked, and some foliated, and terminated by spikes of small pentapetalous nectariferous flowers, the nectarium frequently of singular shapes, resembling in some sorts the figures of men, and various sorts of insects, as bees, flies, &c.

Class and order, *Gynandria Diandria*.

Characters.] CALYX, a vague spatha, protruding a simple spadix of flowers, without any perianthiums. COROLLA, five oblong, equal, ascending petals, and a dependent long nectarium, keel-shaped behind. STAMINA, two very short gynandrous filaments, and erect antheræ. PISTILLUM, an oblong contorted germen below the flower, a style adhering to the inner border of the nectarium, and obsolete stigma. PERICARPUM, a trigonal, unilocular, trivalvular capsule, filled with numerous seeds like dust.

The English name *Twyblade*, is of ancient derivation, from some of the species being remarkable for having only two leaves.

There are many species, but the most noted are the following, which are admitted into some pleasure-gardens for variety.

1. OPHRYS *ovata*.

Oval-leaved Ophrys, or Common Twyblade.]

Hath a bulbo-tuberous, fibrated root, crowned by two oval, broad, obtuse, veined, opposite leaves; an erect, succulent, green stalk, six or eight inches high, naked above, and terminated by a loose spike of greenish flowers, having the lip of the nectarium bifid.

The flowers of this species resemble the figure of gnats.

2. OPHRYS *spiralis*.

Spiral Orchis, or Triple Ladies Traces.] Hath bulbo-tuberous, oblong, aggregated roots, crowned by a cluster of oval, pointed, ribbed leaves; erect simple stalks, half a foot high, terminated by long spikes of white, odoriferous flowers, hanging to one side, having the lip of the nectarium entire, and crenated.

3. OPHRYS *Nidus-avis*.

Bird's-nest Ophrys.] Hath a bulbous, fibrated, clustered root; upright, thick, succulent stalks, a foot high, sheathed by the leaves, and terminated by loose spikes of pale-brown flowers; having the lip of the nectarium bifid.

4. OPHRYS *anthropophora*.

Man-shaped Ophrys, or Man Orchis.] Hath a roundish bulbo-tuberous root, crowned with three or four oblong leaves; upright thick stalks, rising a foot and a half high, adorned with narrow leaves, and terminated by loose spikes of greenish flowers, representing the figure of a naked man; the lip of the nectarium linear tripartite, with the middle segment longest and bifid.

Variety] With brownish flowers tinged with green.

5. OPHRYS *insectifera*.

Insectiferous Ophrys, or Insect Orchis.] Hath two roundish bulbous roots, crowned with oblong leaves; erect leafy stalks, from six to ten or twelve inches high, terminated by spikes of insect-shaped greenish flowers, having the lip of the nectarium almost five-lobed.

This wonderful species exhibits flowers in different varieties, that represent singular figures of flies, bees, and other insects; and are of different colours in the varieties.

Varieties are.] Fly-shaped *Ophrys*—great fly *Ophrys*—large green fly *Ophrys*—blue fly *Ophrys*—yellow fly *Ophrys*—bee *Ophrys*—large bee *Ophrys*—black bee *Ophrys*—green-winged bee *Ophrys*—beetle *Ophrys*—spider *Ophrys*.

6. OPHRYS *Monorchis*.

(*Monorchis*.) or *Musky Ophrys*.] Hath a roundish bulbo-tuberous root, crowned with three

or four oblong leaves; an erect naked stalk, six inches high, terminated by a loose spike of yellowish, musky-scented flowers.

All these six species of *Ophrys* flower in summer, at different times in different sorts, from May until July; and in most of the sorts exhibit a singularly curious appearance.

The plants are all perennial in root, which are of the bulbo-tuberous, fleshy kind, from which the flower-stalks rise annually in the spring, and decay in autumn; at which period is the proper time for removing the roots from one place to another.

They all grow wild in England, &c. are residents of woods, bogs, marshy grounds, sterile pastures, chalky soils, and the like places, where they flourish and display their singular flowers in great abundance, from which places they are introduced into gardens for variety; and having procured some plants at the proper season, and planted them in soils and situations somewhat similar to that where they naturally grow, the roots will abide for several years, and flower annually.

They may be easily obtained from the places where they naturally grow.

The proper season for removing them is in summer, when the stalks decay; therefore repairing either to the places of their growth, when in full bloom, or to the nurseries, mark a quantity of the best plants with sticks; and when the stalks and leaves assume a decayed state, proceed to dig up the roots, and bring them into the garden and plant them directly.

It is proper to suit the situation and soil of the different sorts as near as possible; those of the woods place in shady moist borders, or in shrubbery quarters among trees; those of boggy or marshy ground, plant in the moistest parts of the garden; and those found on dry sterile plains or commons, should have a dry open exposure.

Having planted them, let them remain constantly undisturbed, unless particularly wanted to be removed from one place to another, for the less they are disturbed the better they will flower.

As to their propagation, it may be tried by seed in a shady border, as soon as it is ripe; likewise by off-sets from the root, though they multiply sparingly in gardens; however roots of some standing may be examined at the proper season, and any off-sets that occur, separated and planted directly in the proper places.

ORCHARD, a garden-department, con- signed entirely to the growth of standard fruit-trees, for furnishing a large supply of the most useful kinds of fruit.

In the Orchard you may have as standards

all the principal sorts of apple-trees, pears and plums, and all sorts of cherries; which four species are the capital Orchard-fruits: each of which comprise numerous valuable varieties; but to have a complete Orchard, may also have quinces, medlars, mulberries, service-trees, filberts, Spanish nuts, berberries; likewise walnuts and chefnuts; which two latter are more particularly applicable for the boundaries of large Orchards, in which they will screen the other trees from the insults of impetuous winds and cold blasts: all of which trees being arranged in rows from twenty to thirty feet distance, as hereafter directed.

But sometimes Orchards consist entirely of apple-trees, particularly in the cyder-making counties, where they are cultivated in very great quantities in large fields, and in hedge-rows, for the fruit to make cyder for public supply.

And sometimes whole Orchards of very considerable extent are entirely of cherry-trees; but in this case, it is when the fruit is designed for sale in some great city, as London, &c. for the supply of which city, great numbers of large Cherry-Orchards are in some of the adjacent counties, but more particularly in Kent, which is famous for very extensive Cherry-Orchards; many of which are entirely of that sort called Kentish Cherry, as being generally a great bearer; others are stored with all the principal sorts of cultivated cherries, from the earliest to the latest kinds. See *PRUNUS Cerasus*.

A general Orchard, however, composed of all the before-mentioned fruit-trees, should consist of a double or treble portion of apple-trees or more, because they are considerably the most useful fruit, and may be continued for use, in the different sorts, the year round.

The utility of a general Orchard, both for private use and for profit, stored with the various sorts of fruit-trees, must be very great, as well as afford infinite pleasure from the delightful appearance it makes from early spring till late in autumn: in spring the various trees in blossom are highly ornamental; in summer, the pleasure is heightened by observing the various fruits advancing to perfection; and as the season advances, the mature growth of the different sorts arriving to perfection in regular succession from May or June until the end of October, must afford exceeding delight, as well as great profit.

Of the proper Extent, Situation, and Soil, for this Department.

As to the proper extent of ground for an Orchard, this must be proportioned, in some measure, to the extent of land you have to work

work on, and the quantity of fruit required either for private use, or for public supply: so that an orchard may be from half an acre or less, to twenty acres or more extent.

With respect to the situation and aspect for an Orchard, we may observe very thriving Orchards both in low and high situations, and on declivities and plains, in various aspects or exposures, provided the natural soil is good: I should, however, avoid very low damp situations as much as the nature of the place will admit; for in very wet soils no fruit-trees will prosper, nor the fruit be fine; but a moderately low situation, free from too copious wet, may be more eligible than an elevated ground, as being less exposed to tempestuous winds; though a situation having a small declivity is very desirable, especially if its aspect incline towards the east, south-east, or southerly, which are rather more eligible than a westerly aspect; but a north aspect is the worst of all for an Orchard, unless particularly compensated by the peculiar temperament or good quality of the soil: I would, however, remark, for the advantage of those that are not accommodated with choice of situation and aspect, that they need not be under any great anxiety, provided, as above said, if the soil is but suitable; only observing, if possible, to abandon very low damp situations, for the reason before given.

And as for soil, any common field, land, pasture, or other ground that produces good crops of corn, grass, or kitchen-garden vegetables, is suitable for an Orchard; if it should prove of a loamy nature, it will be a particular advantage: any soil, however, of a good quality, not too light and dry, or too heavy, stubborn, or wet, but of a medium nature of a soft pliant temperature, not less than one spade deep of good staple, will be proper for this purpose.

Where, however, the soil is naturally defective, the defects must be rectified as well as possible, by the application of proper manures, and composts prepared as directed under those articles, and applied either to the whole ground, if but of moderate extent, or to the places where each tree is to stand, for a space of eight or ten feet circumference, working it up with the natural soil of the place.

This, however, in extensive Orchards, would be a very chargeable operation; therefore those who are at liberty to chuse, should have particular regard to the fixing upon a proper spot, where but little or no foreign aid is requisite.

Preparation of the Ground.

The preparation of the ground for the reception of the trees, is either by digging a ca-

pacious place for each tree, or a general trenching, &c. as may be thought necessary or convenient; if the latter is intended, it may be effected either by a regular trenching, if but a small or moderate extent of ground, or if very considerable, by deep ploughing, especially for several feet width for each row of trees; but trench-digging, one or two spades, as the soil will admit, is the most eligible, either wholly, or only for the present, in the places where the lines of trees are to stand, a space of six or eight feet wide, all the way in each row, especially if it be grass-ground, and intended to be kept in sward; or if any under-crops are designed to be raised, the ground may be wholly trenched at first; but as to this you may suit your convenience, observing in either case to trench the ground in the usual way to the depth of the natural soil; and if in grass, turn the sward clean to the bottom of each trench, which, when rotted, will prove an excellent manure.

In planting Orchards, however, on grass-ground, and a good soil, may only dig a pit for each tree, capacious enough for the reception of the roots, loosening the bottom well, without the labour of digging any other part of the ground: where the ground, however, is trenched either wholly, or some considerable width along the place of each row of trees, it will consequently prove of greater advantage in promoting their free growth.

The ground must be fenced securely against cattle, &c. either with a good ditch and hedge, or with a paling-fence, &c. as may be most convenient. See HEDGES.

Method of planting the Trees.

The best season for planting all the sorts of fruit-trees is autumn, soon after the fall of the leaf, from about the latter end of October until December; or indeed it might be performed any time in open weather from October until March.

All the sorts of fruit-trees proper for this department, if not furnished with them in your own nursery, may be had very reasonable at all the public nursery-grounds; observing to chuse them principally full standards, with straight clean stems, five or six feet high, especially the apples, pears, plums, cherries, and other tree kinds, each with a branchy well-formed head, of from two or three to four or five years growth; and let several varieties of each particular species be chosen, that ripen their fruit at different times, from the earliest to the latest, according to the nature of the different sorts, that there may be a sufficient supply of every sort regularly during their proper season; and of apples and pears in particular,

particular, chuse a much greater quantity of the autumnal and late-ripening kinds, than the early sorts; but most abundantly of apples: for the summer-ripening fruit is but of short duration, only proper for temporary service; but the later-ripening kinds keep sound some considerable time for autumnal use; and the latest sorts that ripen or acquire full growth in October, continue in perfection for various uses all winter, and several sorts until the season of apples comes again. See the list of the different sorts of fruit in this work, under their respective genera.

Having made choice of the proper sorts, and marked them, let them be taken up with the utmost care, so as to preserve all their roots as entire as possible; and when taken up, prune off any broken or bruised parts of the roots, shorten long stragglers, and just tip the ends of the principal roots in general with the knife, on the under side, with a kind of slope outward.

If the trees have been already headed, or so trained as to have branched out into regular shoots to form each a proper head, they must be planted with the said heads entire, only retrenching, or shortening any irregular or ill-placed shoot that takes an awkward direction, or grows across its neighbours, or such that run considerably longer than all the rest, &c. as observed under the respective articles in training them for standards; also in the article STANDARD-TREES.

The arrangement of the trees in the Orchard must be in rows, each kind separate, at distances according to the nature of growth of the different sorts; but for the larger growing kinds, such as apples, pears, plums, cherries, &c. they should stand from twenty-five to thirty or forty feet every way asunder, though twenty-five or thirty feet at most is a reasonable distance for all these kinds.

Each species and its varieties should generally be in rows by themselves, the better to suit their respective modes of growth: though for variety may have some rows of apples and pears arranged alternately; as also plums and cherries; and towards the boundaries may have ranges of lesser growth, as quinces, medlars, filberts, services, &c. and in the outer row of all may have walnut-trees, and some chestnuts, or principally the former, set pretty close to defend the other trees from violent winds.

According to the above distances proceed to stake out the ground, for making the holes for the reception of the trees; which if made to range every way, will have a very agreeable effect, and admit the currency of air, and the sun's influence more effectually.

But in planting very extensive Orchards, some divide the ground into large squares or quarters of different dimensions, with intervals of fifty feet width between: serving both as walks, and for admitting a greater currency of air: in different quarters planting different sorts of fruit, as apples in one, pears in another, and plums and cherries in others, &c. and thus it may be repeated to as many quarters, for each species and its varieties, as may be convenient.

As to the mode of planting the trees, it is the same as directed under their several articles, and the article PLANTING. A wide circular hole must be dug for each tree, capacious enough to receive all the roots freely every way without touching the sides, and of proportionable depth. When the holes are all ready, proceed to planting, one tree to each hole, a person holding the stem erect, whilst another trims in the earth, previously breaking it small; and cast it in equally about all the roots, frequently shaking the tree by the stem, gently up and down, to cause the mould to settle in close about all the smaller roots and fibres, and so as to raise the tree gradually up, that the crown of the roots may be but about three or four inches below the general surface; and when the hole is filled up, tread it gently, first round the outside, then near the stem of the tree; forming the surface a little hollow; and then if on the top of all is laid some inverted turf to the width of the holes, forming it with a sort of circular bank, three or four inches high, it will support the tree, and guard the roots from drying winds, and the summer's drought: observing that each tree stands perfectly upright, and that they range exactly in their proper rows.

If the orchard is much exposed to the winds, it may be proper to stake the new-planted trees to support them in their proper position, and secure them from being rocked to and fro by the wind, which would greatly retard their rooting afresh; placing one or two strong tall stakes to each tree; but, in larger trees, the most effectual method is to have three stakes to each, placed in a triangle, meeting at top near the head of the tree, wrapping a hay-band round that part of the stem, to prevent its being barked by the stakes or tying; then tie the stakes at top close to the tree with some proper bandage, bringing it close about the stem and stakes together, over the hay-wrapping, in a proper manner to secure the tree firmly in an erect posture.

The ground of the Orchard, between the rows of trees, is very commonly laid down in grass, as being the most convenient for ad-

mitting of coming readily at the trees at all times to gather the fruit: but if thought proper, it may be employed for some years either wholly, or in part, for the produce of kitchen vegetables, or for the growth of corn, turneps, potatoes, &c. being careful in digging or ploughing the ground for the reception of these crops, not to go too near to disturb the roots of the trees; likewise not to have any strong-growing plants within three feet of each side of the rows of young trees: however, after the trees are advanced in growth, and begin to bear any thing considerable, and where intended wholly as an Orchard, it may be more eligible to lay the ground down entirely in grass, as it will be then more in character of an orchard, and be more convenient for gathering the fruit, and doing any necessary work to the trees; but in any of these ways, every one may suit his inclination or convenience.

If, however, it is laid down in grass, no cattle should be turned in to graze at large, unless the stems of each tree is previously well secured with posts and railing, and watered with thorn-bushes, especially in young Orchards, otherwise they will bark the trees, to their very great injury, nor should large cattle be turned into Orchards, where the branches of the trees are yet low and within their reach.

General Culture.

With regard to the general culture of Orchard fruit-trees, observe for one thing, that as being standards, their heads should generally be permitted to branch out nearly in their own natural manner, with the branches at full length, without shortening, only on particular occasions, and they will gradually form themselves into large branchy heads, and all the branches soon assume a bearing state; very little pruning of any sort being required to standard fruit-trees, except in particular cases, as above hinted, of superfluous or very irregular growths; as for example, all suckers arising from the root must constantly be taken off close; likewise divest the stems of all side-branches coming out below the head; and all luxuriant shoots arising in the heart or middle of the tree, or in any part where they appear too much crowded, should be pruned off close: if any particular branch of the head should become of very long straggling growth, extending considerably beyond all the rest, it may be shortened as you shall see proper, down to some young shoot, or lower branch it supports, so as to preserve a little regularity; likewise any large branch that takes an irregular direction across the others,

or any other awkward growth, such may either be shortened down to any lower branch it supports, that is of a more regular growth, or entirely retrenched, as it may seem proper, whereby to continue some uniformity in the head; and if the head in general becomes at any time over-crowded with branches, thin out the worst and most irregular growers of the superfluity: all dead wood and cankered parts should also be cut off to the live wood.

But remarking, that, except in the above cases, the branches in general of standard fruit-trees, in every stage of growth, should be suffered to shoot forth, both in length, and to branch out laterally in their own way; for as most of the sorts first form their fruit-buds, or spurs, near the extremity of the branches or shoots, or the parts which were once the terminals, if pruning their ends was practised, it would not only be cutting off the parts where the fruit would have been first produced, but would force out a number of lateral useless shoots, and crowd the tree with superfluous or unnecessary wood, and greatly retard the branches from forming the above fruit-spurs or buds for bearing; and unless these are formed in plenty, none of the principal tree-kinds can ever produce any tolerable crops of fruit; but the trees being suffered to take their natural growth, according to the above rules, all the branches and shoots will gradually form fruit-spurs both laterally along their sides, and towards the extreme parts, as above intimated, at almost every eye or bud.

By the above hints it is obvious that standard fruit-trees require but very little culture in respect to pruning; and the less they are pruned, except in the before-mentioned cases, the better they will bear.

Besides, to attempt at any regular pruning of Orchard or other standard fruit-trees, would prove a very tedious as well as unnecessary work.

Though it should be remarked, that as sometimes Orchard fruit-trees will casually become very crowded in the head with considerable growth of superfluous wood or branches, forming a confused thicket, in which case, either in young or old growth, a regulating thinning should be performed, to cut out the most crowding, disorderly, and evidently most unserviceable and improper branches, so as that the principal general bearers may stand somewhat distant, and regular, as well as to admit the essential benefit of the sun and free air more effectually, and the fruit will always be larger and finer in proportion; or also where any trees appear of a cankerous nature in their branches, or any branches

branches discover a decaying worn-out state it is proper to cut out such parts accordingly, as it may seem necessary, both to promote, and preserve a more general healthful state and agreeable lively appearance in the other general branches, and to make room for these and others to advance in a more prosperous growth.

When necessary, however, to prune any of these trees occasionally in the above cases, observe that the proper season for that work is any time from the fall of the leaf until March. Likewise observe in performing that operation, that such branches as require retrenching should be cut off quite close either to their origin, if necessary, or close to any more convenient branch it may support, not leaving any stump, and make the cut as even and smooth as possible.

But dead wood may be cut out any time when discovered; or as it may be convenient.

Orchard-trees are sometimes greatly infested with moss growing all over their branches, but more particularly those trees which are situated in very damp soils; also often in old Orchards where the trees stand so close as to crowd one another so considerably as to exclude the free air and beneficial influence of the full sun; or sometimes occasioned by the general branches of the respective trees becoming so superabundant or too numerous, in a crowded confused thickety disorder to the exclusion of the said essentially requisite beneficial aids to vegetation; in which several cases, the trees commonly assume a stunted unkindly growth, producing but indifferent crops, and the fruit often small and ill-flavoured. The only remedy for this disaster, is to thin out some of the branches where thickest, to admit the sun and air more freely, and scrape the moss off from the remainder, with an instrument directed below; but where the trees thus infested stand very close to one another, some of them should be cut down to admit a larger portion of air, and benefit of the sun's heat and light; and for the same reason thin the branches of the remaining trees; then clear the branches in general from the grossest of the moss; for which purpose you should be provided with some iron scrapers hollowed on the edge, and of three different sizes to suit the different branches, having the edges a little blunted; and with these tools scrape off the moss from all the principal branches at least, and of as many of the smaller ones as your time will permit, for it is tedious work where there are many trees: after this, if the ground of the Orchard, either wholly or but ten or twelve feet width

along each row of the trees, is dug or ploughed, although not advised as absolutely necessary, would be of additional advantage, give new vigour to the roots, and which together with the thinning of the trees to admit the sun and air freely, and the principal branches being divested of the moss, you will find them shoot at top with fresh vigour, and the quantity, size, and quality of the fruit be greatly augmented in a year or two.

For farther remarks respecting the particular culture of each different species, and its varieties, cultivated as Orchard trees, see the several articles under their respective genera.

And with respect to the times of ripening of the different fruits, time and method of gathering the various kinds, and of preserving those of the keeping sorts, it is properly exhibited in all the different articles under their proper heads.

ORCHIS, (*Orchis*) Fool-stones.

The plants are hardy, herbaceous, bulbous-rooted, flowery perennials, mostly natives of our meadows, pastures, woods, and uncultivated places, and which, like the species of *Ophrys*, having great singularity in their flowers, are admitted into pleasure-gardens for variety; most of them have roots composed of two testiculated bulbs, sending up annually one or more flower-stalks, from about five or six inches to half a yard high; terminated by spikes of pentapetalous nectariferous flowers of various odd figures in different species, resembling sometimes that of a naked man, sometimes a butterfly, gnat, and other strange shapes.

Class and order, *Gynandria Diandria*.

Characters.] CALYX, a vague spatha, protruding a simple spadix of flowers, without perianthiums. COROLLA, five petals, three of them exterior and two interior, rise upward and meet; and a monophyllous nectarium between the divisions of the petals, having a short upper lip; the under large, broad, and spreading; with the tube nutant and horn-shaped. STAMINA, two short gynandrous filaments, and oval erect antheræ. PISTILLUM, an oblong contorted germen below the flower, very short style, and a compressed obtuse stigma. PERICARPIMUM, an oblong, three-keeled, trivalvate, unilocular capsule, filled with numerous seeds.

The roots of most of the species of this genus being composed of two oblong fleshy bulbs joined together, bearing an obvious resemblance to the testiculi of animals, it derives both its generic name, and the English appellation, Fool-stones, &c. Most of the species are celebrated provocatives, which restorative quality is chiefly possessed by the roots; of

which also, by a late discovery, may be prepared a powder for making soap, nearly resembling that from Turkey, the alimentary virtues of which are well known.

There are numerous species, but the most remarkable are the following:

1. *ORCHIS mascula*.

Male Fool-stones.] Hath a root composed of two undivided bulbous fleshy tubers, crowned with oblong, broad, spotted leaves; upright flower-stalks, a foot high, garnished with one or two narrow amplexicaule leaves, and terminated by a long spike of reddish-purple flowers, having the petals reflexed backward; a quadrilobed crenated lip to the nectarium, and an obtuse horn.

The flowers of this species possess a very agreeable odour.

It grows wild in meadows and pastures.

2. *ORCHIS Morio*.

Female Orchis.] Hath a double undivided bulbo-tuberous root, crowned with oblong, ribbed, spreading leaves; erect flower-stalks, eight or ten inches high, garnished with a few amplexicaule leaves, and terminated by a short loose spike of flowers, having connivent petals; a quadrid crenated lip to the nectarium, and an obtuse horn rising upward.

Varieties.] Purple-flowered—red-flowered—violet-coloured—flesh-coloured—and white-flowered.

It grows naturally in woods and rough places.

3. *ORCHIS militaris*.

Military, or Man Orchis.] Hath a double undivided bulbous fleshy root, crowned with oblong amplexicaule leaves; erect flower-stalks, eight or ten inches high, terminated by a loose spike of ash-coloured and reddish flowers, having confluent petals; a quinquefid, rough, spotted lip to the nectarium, and an obtuse horn.

The structure of the flowers exhibit the figure of a naked man; and are often of different colours in the same flower, as ash-colour, red, brown, and dark-striped.

It grows in chalky soils and pasture grounds.

4. *ORCHIS bifolia*.

Two-leaved Common Butterfly-Orchis.] Hath a double undivided bulbous root, crowned with usually two, or from two to four oblong leaves; upright flower-stalks, eight or ten inches high, garnished with a few small amplexicaule leaves, and terminated by a loose spike of butterfly-shaped white flowers, with spreading petals; a spear-shaped entire lip to the nectarium, and a very long horn.

This is a resident of rough pastures, and bushy places.

5. *ORCHIS latifolia*.

Broad-leaved Handed Orchis.] Hath a double, bulbous, sub-palmated, or almost hand-shaped, straight root; upright thick flower-stalks, ten or twelve inches high, garnished the whole length with long, broad, amplexicaule leaves, and terminated by a short close spike of red purple-spotted flowers, having a conical-shaped horn to the nectarium; a trilobate lip reflexed on the sides, and with bractæa longer than the flowers.

It grows naturally in meadows and pastures.

6. *ORCHIS maculata*.

Spotted, Handed Orchis.] Hath a bulbous, palmated root, with the divisions spreading wide asunder; upright, thick, spotted flower-stalks, a foot or more high, fully garnished with long, narrow, dark-spotted amplexicaule leaves, and terminated by a close spike of flowers, having the hinder part of the petals spreading; a plane, trifid, spotted lip to the nectarium, and the horn shorter than the germen.

Varieties.] Purple-flowered—deep purple—rose-coloured—and white-flowered.

They are residents of moist meadows and pastures.

7. *ORCHIS abortiva*.

Abortive Orchis, or purple Bird's-Nest.] Hath bulbous roots clustered together; upright, thick, purple stalks, a foot and a half high, sheathed with narrow purplish leaves, and terminated by a loose thyrse of purple flowers, having the lip of the nectarium oval and entire.

It grows wild in meadows and shady places.

8. *ORCHIS conopsea*.

Gnat Orchis.] Hath a bulbous palmated root, crowned with long narrow spotless leaves; upright stalks, a foot high, sheathed with short narrow leaves, and terminated by a long spike of red flowers, having two of the petals spreading; a trifid lipped nectarium, and a bristly horn longer than the germen.

It is a biennial inhabitant of meadows and upland pastures.

All these Orchises are very hardy plants, the first seven are perennials, the eighth is rather of a biennial nature, have mostly solid bulbous fleshy roots, or tubercles, sending forth fibres from the top and bottom; durable by the root, in the perennials, but annual in leaves and flower-stalks; most of them are natives of England, growing wild, some sorts in meadows, woods, and pastures; others in dry sterile uncultivated soils; but for the singularity and beauty of the flowers are introduced into many curious gardens to increase the

the variety in the herbaceous collection, and may be procured from the places where they grow spontaneously; which is in many parts of the kingdom: several of the sorts are also retained in the public nurseries for sale.

They flower in May, June, and July, but principally in June; their mode of flowering is universally in spikes, many flowers in each spike.

A few of these singular plants may be disposed in principal parts of the pleasure-garden, in any of the compartments where they may be the most conspicuous; they, however, are the most prosperous in a situation and soil somewhat similar to that where they naturally grow.

The season for removing them is in summer and autumn, after they have done flowering, when their leaves and stalks decay: mark this particularly, and it is advisable to plant them again as soon as possible after removal; planting them three inches deep; and let them remain undisturbed several years, for the less they are removed the stronger they will flower.

We formerly observed, that the roots of these plants were possessed of very nutritious virtues, particularly for making salep. By a late discovery communicated to the Royal Society, it appears that of the root of the *Orchis mascula*, with most of the other Orchis-roots of our own country, may be prepared a powder to resemble the *Salep* that comes from Turkey; the alimentary virtues of which, as before observed, are well-known, as well as its exorbitant high price, which confines it in a great degree only to persons of affluent circumstances; but as many of the species of *Orchis* are indigenous plants of Britain, growing spontaneously in most parts of the kingdom, and as they flourish in almost any dry barren soil, by a little culture, all ranks of people might in a short time be accommodated with this nutritious vegetable for making salep powder; and for encouraging its propagation the Society of Arts and Sciences in London have offered premiums.

Their propagation may be tried both by seed and by off-sets of the roots.

By seed.—This must be very carefully collected in the places where the plants grow naturally; and sow it directly in the garden, in a border of light earth, and rake it in with a light and even hand; and if it grows freely, the plants may either be thinned and remain where sown, or when a year or two old, may plant them out in rows a foot asunder.

By Roots.—As before observed, the roots

may be procured in plenty from the places of their growth, taking them up when their leaves decay in summer, and plant them directly where they are to remain, three inches deep: here they will probably increase by off-sets, like other bulbo-tuberous roots, which may be taken up every two or three years, at the proper season as above, in order to separate the off-sets, planting the whole again as soon as possible, placing the off-sets in beds by themselves.

When designed to cultivate these plants for use, the roots should be deposited in beds, in rows ten or twelve inches asunder, and the depth as above.

ORDO, an Order: the first sub-division of a class in the sexual arrangement of plants; in which each of the twenty-four classes is subdivided into Orders, or secondary divisions, founded principally on the number of styles or female organs, and some other striking part of the fructification of flowers; and the Orders are divided into genera, &c.

Each Order is distinguished by a proper name, according to the number of styles, &c. for example, when one style, it is termed *Monogynia*; two styles, *Digynia*; three, *Trigynia*; four, *Tetragynia*; five, *Pentagynia*; many styles, *Polygynia*, &c. which names of the Orders are subjoined to that of their respective classes, under that arrangement, as well as in all the different genera described in this work, immediately preceding the *Characters*. See the article CLASSIS.

The names of the Orders are often the same in different classes, because the same idea predominates in their institution. See CHARACTERS CLASSIS, and GENUS.

ORIGANUM, Origan, or Marjoram.

This genus furnishes some under-shrubby perennials, and an herbaceous annual; all fine aromatics, some for the kitchen-garden, pleasure-ground, and green-house; rising with upright branchy stems, from six or eight inches to two feet high, garnished with oval and roundish leaves, and small monopetalous ringent flowers collected into spikes and heads, at the axillas and tops of the stalks.

Class and order, *Didynamia Gymnospermia*.

Characters] CALYX, an involucre composed of oval, coloured leaves, placed imbrication, with unequal perianthiums. COROLLA, one ringent petal, with a cylindric compressed tube, and the upper lip plane and emarginated, the lower one trifid. STAMINA, two long and two short filaments, and simple anthers. PISTILLUM, a quadrifid germina, slender style and bifid stigma. PERICARPIMUM, none;

none ; four naked seeds lodged in the bosom of the calyx.

The principal species of our gardens are two hardy perennials, and an annual for the open ground, and five perennials for the green-house.

Hardy Perennial Kinds.

1. *ORIGANUM vulgare.*

Common Origany, or Wild Pot Marjoram.] Hath a fibry perennial root ; many upright, square, ligneous stems, branching half a yard or two feet high, closely garnished with small oval, almost close-fitting, opposite leaves, with smaller ones from the axillas ; and at the sides and ends of the branches, roundish, paniculated, conglomerated spikes of small pale-red flowers, having oval bractæa longer than the calyx.

Varieties.] Purple-flowered—white-flowered—variegated-leaved.

2. *ORIGANUM heracleoticum.*

Winter Sweet Marjoram.] Hath a fibrated perennial root ; upright, four-cornered, purplish stems, branching half a yard high, garnished with small oval, obtuse, hairy, opposite leaves, on short foot-stalks ; and at the axillas of the stems, long aggregate spikes of small white flowers, having the bractæa as long as the calyx.

Variety.] Variegated-leaved.

Both the above hardy perennial *Origanums* are finely-scented warm aromatics, excellent for culinary purposes, particularly for broths, soups, &c. they have likewise merit for medical uses, and for giving fragrance to ointments ; so that the plants are proper both for kitchen and physic-gardens, and may also be employed in the pleasure-ground as plants of variety.

Annual Kind.

3. *ORIGANUM Marjorana.*

(Marjorana)—or Annual Sweet Marjoram.] Hath a fibrous annual root ; upright branchy stems, rising a foot or fifteen inches high ; small, oval, obtuse, hoary whitish leaves ; and the stem and branches terminated by compact, downy spikes of small white flowers, in close, roundish heads.

This annual is an aromatic of the highest fragrance, is admirable for kitchen use, and is excellent for nosegays ; so is proper both for the kitchen and pleasure-garden, but more particularly the former.

It is often called knotted Marjoram, from the flowers growing in close knotted-like heads.

Green-house Kinds.

The following mostly assume an under-

shrubby growth ; frequently with abiding stalks, if they have shelter here in winter.

4. *ORIGANUM Dielamnus.*

(Dielamnus creticus)—Dittany of Crete—or Origany of Mount Ida.] Rises with slender, hairy, purple stalks, branching by pairs eight or ten inches high ; garnished with round thick leaves, the under ones woolly ; and the branches terminated by nodding spikes of purple flowers.

This species is a very strong aromatic.

5. *ORIGANUM sipyleum.*

Origanum of Mount Sipylus.] Rises with upright, four-cornered, smooth, purplish stalks, branching by pairs near two feet high ; oval smooth leaves ; and all the branches terminated by oblong nodding spikes of purplish flowers.

6. *ORIGANUM creticum.*

Cretan Origany, or Aggregated Marjoram.] Rises with upright, four-cornered stems, branching a foot and a half high ; oval, obtuse, hoary leaves ; and the stalk and branches terminated by long, aggregate, prismatic spikes of small white flowers, having membranous bractæa double the length of the calyx.

7. *ORIGANUM smyrnæum.*

Umbelliferous Origany of Smyrna.] Rises with upright, branchy, hairy stalks, a foot and a half high ; oval, acutely serrated leaves ; and umbellate-clustered spikes of white flowers.

8. *ORIGANUM ægyptiacum.*

Ægyptian Shrubby Marjoram.] Rises with a shrubby stem, branching a foot and a half high ; roundish, fleshy, hollowed, woolly leaves ; and the stalks and branches terminated by roundish, naked spikes of pale-red flowers.

All these eight species of *Origanum* flower in July and August ; the flowers are small, monopetalous, ringent, and collected into verticilli round the stalks ; succeeded by ripe seed in autumn ; though in this country the annual Majoram, and the five green-house sorts, seldom perfect seed well, unless the autumn proves remarkably fine and warm : in default, however, of seed, the propagation of all the perennial sorts, both hardy and green-house kinds, is easily effected by slips of the roots, &c. And the seed of the annual sort is imported plentifully from France or Italy, by the seed-dealers.

Most of the species are remarkable for their agreeable aromatic fragrance and quality.

The first three sorts particularly have great merit as culinary aromatics for the kitchen-garden,

garden, and may also be introduced into the pleasure-ground, in patches in the open borders to increase the variety, and for nosegays, &c. the variegated perennial Marjorams in particular have a pretty effect; they are all easily raised from seed in the open ground in spring, and the perennial sorts also by dividing the roots; all of which sorts, both perennials and annuals, when designed for the kitchen-garden, should generally be disposed in borders or beds, the perennials in rows a foot asunder, where they will abide for years; and the annual sort being always raised from seed annually, it may either remain where sown, or the young plants may be planted out in rows six or eight inches distance; and when designed to have any of the sorts in the pleasure-garden dispose them about the borders in patches.

But the last five species being exotics from warm countries, they require shelter here in winter, so must be potted and placed in the green-house collection, or may be preserved all winter in a common garden-frame, furnished with lights to put on in nights and cold weather.

Propagation, &c. of all the Sorts.

Their different methods of propagation are,—the hardy perennial species by seed and by slipping the roots; the annual sort only by seed annually; and the five green-house kinds principally by slips and cuttings.

Two Hardy Perennial Sorts.—Both these hardy perennials may be propagated by seed, by parting the roots and by cuttings.

By Seed.—This may be had at the seed-shops: sow it in spring, March or April, in any bed or border of light earth, and rake it in with a light hand; they will soon come up: when the seedlings are a few inches high, plant them out in moist weather, in rows ten or twelve inches distance, finally to remain, giving occasional waterings till fresh rooted.

By Parting the Roots.—Autumn is the best season, though it may also be performed successfully in spring. Having some large plants, slip or divide the roots into slips, each furnished with fibres; which plant in rows, as directed for the seedlings, giving occasional waterings, and they will readily grow, and become good bushy plants by autumn following: may plant slips or cuttings in summer.

Their general culture is the keeping them clean from weeds; and every autumn cut down all decayed stalks; loosen the earth between the plants; at the same time digging the alleys, spread a little of the earth over the surface of the beds.

When any are intended for the pleasure-garden, remove them in autumn or spring, with little balls of earth about their roots, and plant them where wanted.

Annual Sort.—This plant is raised by seed only: sow it annually in spring towards the latter end of March, or in April, on a warm dry border, and rake it in; or may be sown in shallow drills: the plants will soon come up, and may either remain where sown, thinning them to four or five inches distance; or, when two inches high, may be planted out in moist weather, in rows six inches asunder, giving a due supply of water till fresh-rooted, and they will soon cover the ground, and not need any farther culture.

When any are designed for the pleasure-garden, the seed may be sown in patches where you would have them remain to flower.

Green-house Kinds.—All these sorts are propagated by slips or cuttings of the young shoots in spring and summer. If you plant them early, let it be in pots, and plunge them in any hot-bed, they will readily take root; but if in summer, they may be planted either in pots, or in a shady border. In either mode of planting, give water directly, which repeat as occasion may require in moderate quantities; and if those that are planted in the open air, either in pots, or in the full ground, are covered down with hand-glasses, it will facilitate their rooting; but the glasses must be removed when the plants begin to shoot at top: the plants in either way will be rooted the same year; and towards autumn may be potted off separately into small pots, and afterwards managed as other hardy green-house exotics.

ORNITHOGALUM, Star of Bethlehem.

This genus comprises several herbaceous, bulbous-rooted, flowery perennials, for adorning the pleasure-garden, and some for the green-house collection; having all large bulbous roots, crowned mostly with long, narrow, carinated, and ensiform leaves, and upright naked flower-stalks annually, rising from half a foot to a yard high in different sorts, terminated in long, large spikes of hexapetalous, star-shaped, white flowers.

Class and order, *Hexandria Monogynia*.

Characters. **CALYX**, none. **COROLLA**, six spear-shaped petals, erect to the middle, and plane and spreading above, and are permanent. **STAMINA**, six erect filaments half the length of the corolla, and simple anthers. **PISTILLUM**, an angular germeo, awl-shaped permanent style, and an obtuse stigma.

PERI-

PERICARPIMUM, a roundish, angular, trivalvate, trilocular capsule, containing many roundish seeds.

Of this genus, there are cultivated in our gardens several hardy species for the open borders, and two tender kinds requiring shelter of a green-house, &c. in winter.

Hardy Kinds, for the Open Ground.

1. ORNITHOGALUM *pyramidale*.

Pyramidal, large-spiked, Portugal Star of Bethlehem.] Hath a very large, oval, bulbous root, crowned with long, narrow keel-shaped, dark-green leaves; amidst them an upright, firm, naked flower-stalk, two feet to near a yard high; terminating in a very large, long, pyramidal spike of numerous, ascending, white, starry flowers; appearing in June.

2. ORNITHOGALUM *pyreniacum*.

Pyrenean Green-flowered Star of Bethlehem.] Hath a large onion-like bulbous root, crowned with long, keel-shaped, spreading leaves; an upright, naked flower-stalk, half a yard or two feet high, terminated by a very long spike of yellowish-green flowers on long spreading pedunculi, which, as the fruit ripens, becomes gradually erect, nearly approaching the stalk; flowering in May.

The flowers of this species possess an agreeable sweet scent. The plant is a native of the Pyrenean mountains; also of England, in some meadows, and by way-sides.

3. ORNITHOGALUM *latifolium*.

Broad-leaved Arabian Star of Bethlehem, or Alexandrian Lily.] Hath a very large, roundish, bulbous root, crowned with broad, long, spear sword-shaped leaves, spreading on the ground; an upright, thick, strong, naked flower-stalk, two or three feet high, terminating in a long, loose spike of many large, starry, white flowers, on long pedunculi; appearing in June.

4. ORNITHOGALUM *arabicum*.

Arabian great-umbelled Star of Bethlehem, or Star of Alexandria.] With flowers in a large corymbose umbel.

5. ORNITHOGALUM *umbellatum*.

Umbelliferous Star of Bethlehem.] Hath a large, roundish, white, bulbous root, crowned with long, narrow, keel-shaped, white streaked, spreading leaves; an upright, naked flower-stalk, five or six inches high, terminated by taller pedunculi, sustaining a corymbose umbel of white flowers, having the outside striped with green; appearing in April and May.

It grows wild in England, &c. in some woods and meadows.

6. ORNITHOGALUM *luteum*.

Yellow Star of Bethlehem.] Hath a small, roundish, bulbous root, crowned with two or three narrow, keel-shaped leaves; an upright, two-leaved flower-stalk, six inches high, terminated by a simple umbel of yellow flowers; appearing in April.

It grows wild in England, &c. on the borders of uncultivated fields, meadows, and pastures.

7. ORNITHOGALUM *nutans*.

Nodding Star of Bethlehem—or Star of Naples.] Hath a large, compressed, bulbous root; long, narrow, keel-shaped, dark-green leaves; an upright naked flower-stalk, about a foot high, terminated by a loose spike of flowers hanging on one side, white within, and of a grayish-green without, and with a staminateous, campanulated nectarium; flowering in April and May.

8. ORNITHOGALUM *comosum*.

Tufted-leafy-spiked Star of Bethlehem.] Short racemous spikes, with floral leaves the length of the flowers.

9. ORNITHOGALUM *minimum*.

Least Yellow Star of Bethlehem.] With flower-stalks angled, two-leaved; and the peduncles branchy, umbel-flowering.

Of the above hardy *Ornithogalums*, the first four or five are the most ornamental, and most noted sorts in the English gardens; the others are also kept in many gardens for variety: most of the sorts are exceedingly hardy, and will prosper any where, though the *latifolium*, and *arabicum* are sometimes retained as green-house plants, or potted to have protection of a frame in winter.

Tender Kinds for the Green-house Collection.

10. ORNITHOGALUM *capense*.

Cape Ornithogalum.] Hath a large, irregular, tuberous, dark-brown root, crowned with heart-shaped-oval, ribbed leaves, elevated on foot-stalks; upright, slender, naked stalks, about a foot high, terminated by a loose spike of greenish-white flowers; appearing in October and November.

Variety.] With pale-blue flowers.

11. ORNITHOGALUM *aureum*.

Golden African Ornithogalum.] Hath a large, whitish root, crowned with three or four upright, oval, spear-shaped leaves; about half an inch wide, and three or four long, edged with white, and upright naked stalks, from eight to twelve inches high, terminated by a loose spike of bright orange-coloured flowers; appearing in January and February.

Both species are exotics from the Cape of Good Hope.

All these plants are perennial in root, but annual

annual in leaves and stalks, which in the fix hardy sorts rise annually in the spring, and flower in their proper season: the flowers consist universally of six petals that expand themselves at top like the figure of a star; and being numerous in each spike, some in a large pyramid, are very conspicuous, and in the tall sorts make a very ornamental appearance: succeeded in all the kinds by plenty of ripe seeds in autumn: this, however, is rarely wanted, for the plants propagate exceedingly by off-sets of the roots, which every second year, in summer when they have done flowering, and the leaves and stalks decay, may be taken up, and the off-sets separated for increase.

The hardy sorts are proper furniture for the pleasure-garden, placing the larger growing sorts in the most conspicuous parts, in assemblage with other bulbous flowers; planting the roots in general three or four inches deep, and they may remain unremoved two or three years, when the roots will be increased by off-sets into large bunches, each exhibiting a large cluster of flowers.

And if some roots of the *Ornithogalum pyramidale*, &c. are planted in large pots, one root in each, in order for moving occasionally to adorn any particular compartment, they, when in bloom, will have a fine effect.

The Cape *Ornithogalums* must be always kept in pots of light earth, for the convenience of moving them to the shelter of a greenhouse or garden-frames in winter.

The Propagation, &c. of all the Sorts.

The propagation of all the sorts is effected abundantly by off-sets of the roots.

The hardy sorts in particular multiply by off-sets in great plenty, if they stand two or three years, especially the smaller sorts; the larger kinds also, of some standing, throw out off-sets abundantly enough for a plentiful increase; and the best season for removing all the sorts in order to separate the off-sets is July and August, when their leaves and stalks decay; and the roots may either be planted again in August or September, or kept till October or November, &c. but remarking the autumnal-planted bulbs will flower much stronger than those not planted again till spring. Observe to plant the small off-sets in nursery-beds for a year, managing the whole as directed for other hardy bulbs. See BULBUS.

The Cape *Ornithogalums* are also propagated by slips or off-sets of the roots, which may be slipped when the leaves and stalks decay; planting each slip or off-set in a separate pot of good light earth; and place them to have

shelter from frost and excessive wet weather in winter, and in the full air in summer.

OROBUS, Bitter Vetch.

This genus consists of hardy, herbaceous, fibrous-rooted, very floriferous perennials for the embellishment of the pleasure-garden; rising with erect stems, from about one to two feet high, ornamented with winged leaves of from two to several pair of lobes; and at the axillas and top of the stalks, loose spikes and clusters of papilionaceous, purple and blue flowers of ornamental appearance.

Class and order, *Diadelphia Decandria*.

Characters.] CALYX is monophyllous, tubular, and five-parted at the top. COROLLA is papilionaceous, with a heart-shaped standard, two long connivent wings, a bifid, assurgent, acuminate keel, swollen at the base. STAMINA, ten diadelphous filaments, and oblong antheræ. PISTILLUM, a cylindric compressed germen, a bent style, and narrow downy stigma. PERICARPIUM, an oblongish, acute-unilocular pod, having many roundish seeds.

The plants of this genus are mostly natives of woods and commons in different parts of the world; but several of the sorts are retained in gardens for the beauty of their flowers.

The most material species are the following seven.

1. OROBUS *vernus*.

Vernal Orobis.] Hath strong fibrated roots; upright simple stalks, rising a foot high, garnished with pinnated leaves of two pair of oval lobes, attended by half-arrow-pointed, entire stipula; and at the axillas short spikes of flowers of different colours in the varieties; appearing in March.

Varieties.] Purple-flowered spring *Orobis*—deep blue-flowered—pale blue-flowered.

2. OROBUS *tuberosus*.

Tuberous-rooted Orobis, sometimes called Wood Pea.] Hath a tuberous, knotty, creeping root; upright, angular, simple stems, about a foot long; pinnated leaves, of one to three or four pair of elliptical and lanceolate lobes, attended by half-arrow-pointed stipula; and at the axillas long pedunculi, each having two, three, or four reddish flowers; appearing in April and May.

It is a resident of shady woods in England and other countries.

3. OROBUS *Lathyroides*.

Barbard Lathyrus.] Rises with upright branchy stems about a foot high; conjugated, almost close-fitting leaves, having indented stipula; and at the axillas short pedunculi.

each terminated by a short spike of bright blue flowers.

4. *OROBUS luteus*.

Yellow Siberian Orobus.] Rises with upright, unbranching stalks, a foot and a half high; pinnated leaves, of four or five pair of oval-oblong lobes, attended by broad lunated or moon-shaped stipula; and at the axillas short pedunculi supporting large yellow flowers; appearing in April.

5. *OROBUS sylvaticus*.

Wood Orobus.] Rises with decumbent, branching, hairy stalks, a foot and a half long; winged leaves of six or seven to twelve pair of lobes; and at the axillas close spikes of red and purple flowers; appearing early in June.

This grows naturally in woods in several parts of England.

6. *OROBUS niger*.

Black Orobus.] Rises with upright branchy stems, two feet high; pinnated leaves, of six pair of oval-oblong lobes; and at the axillas long pedunculi, each supporting several purple flowers; appearing in May.

7. *OROBUS pyrenaicus*.

Pyrenean Orobus.] Rises with upright branchy stems, a foot and a half high; pinnated leaves, of two pair of spear-shaped nervous lobes; and at the axillas long pedunculi, terminating in loose spikes of purple flowers; appearing in May.

All these seven species of *Orobus* have strong fibrated roots, which are perennial, but are annual in stalk; rising early in spring and decay in autumn.

They are all very hardy plants, and prosper in any common soil of a garden.

Most of the sorts are very floriferous, and the flowers conspicuous and ornamental for adorning the flower compartments; the flowers are universally of the papilionaceous or butterfly kind, consisting each of four irregular petals, i. e. a standard, two wings, and a keel, and are all succeeded by oblong, acute seed-pods, furnishing plenty of ripe seed in autumn; by which the plants may be propagated, abundantly, as also by parting the roots.

With respect to their merit in gardens, they may be employed in any of the compartments of the pleasure-ground as flowery plants: they will flourish any where and exhibit a pretty variety when in flower.

Their Propagation, &c.

Their propagation is by seed, and by parting the roots.

By Seed.—All the sorts furnish plenty: sow it in autumn, i. e. September, or beginning of October, or early in spring, in any

bed or border, and rake it in, and those of the autumn-sowing will readily come up in spring; but those of the spring-sowing do not come up so freely; as the plants advance, clear them from weeds, and give occasional waterings; and in June or July, when a few inches high, prick them out, in moist weather, in nursery-rows half a foot asunder, to remain to gain strength till October or November, then transplant them where they are to remain.

By parting the Roots.—Autumn, when their stalks decay, is the best time for this: having recourse to some large plants, divide the roots into slips, each furnished with fibres, and plant the largest at once where they are to remain; and the smallest may be planted in nursery-rows for a year.

OSIERS, a species of *Salix*, or Willow, usefully necessary to cultivate in every principal garden for the production of twigs or rods for tying and binding various articles.

The *Osiers*, although described in the different species under the genus *SALIX*, it may be proper here to remark, are those kind of *Salix* or Willows, under the above denomination, whose shoots are of a clean, even, moderately slender growth, most pliant and tough, to admit of bending, twisting, winding, tying, &c. without cracking or breaking asunder, and in which peculiar property are exceeding useful in many garden departments, in various occasions of tying, binding, &c. as for example, good pliant *Osiers* are proper for tying in the branches of espalier trees occasionally to the treillage, and sometimes in tying the stems of new-planted standard trees to stakes for support, and several other similar occasions; as likewise in the kitchen-garden are useful, in the small twigs, for tying up the leaves of early cabbages to forward their cabbaging; as also occasionally in tying up autumn and winter endive for blanching, and many other purposes; and in the market-gardens are of great use for binding their ware in bunches, in order for carrying to market, such as turneps, celery, coleworts, carrots, leeks, onions, horse-radish, &c. as practised by the London gardeners; also in nursery-grounds, are of much use, especially in the public nurseries, for binding or tying bundles of trees and shrubs, &c. for sending to a distance, and for many other purposes in the nursery department; and are particularly useful for occasionally mending or making garden-baskets, especially in places not conveniently situated near proper basket-makers: so that a small plat or hedge-row of *Osiers* would be very useful in most garden departments.

There-

Therefore, for the above occasions, in general gardens, or others of some considerable extent, nurseries, &c. should introduce a small plantation, less or more, of the best Osier kinds, on some low moist situation, near water if possible, or in a row along the sides of any conveniently adjoining rivulet, brook, pond, or watery ditch; planted in the spring, February, or March, in cuttings of young shoots cut down low, to within about six or eight inches of the ground, to form stools; they will quickly grow, rooting below, and shooting strongly at top, and furnish a production of rods and twigs the same year for cutting at the proper season for the afore-mentioned purposes; and will continue producing a similar crop for cutting annually, a quantity of which should always be cut in winter, or early in spring, tied in bundles, and they will continue good for the above uses many months; and when dry, being thrown into water, it will render them supple and pliant. See SALIX.

For the above occasions there are different sorts of Osiers, such as the yellow, green, purple, Dutch Osier, wire Osier, &c. and some others, as explained under the article SALIX.

OSTEOSPERMUM, Hard-seed, commonly called Hard-seeded *Chrysanthemum*.

This genus furnishes shrubby exotics for the green-house collection, rising with shrubby durable stems, branching several feet high, garnished with oval and spear-shaped leaves, and the branches terminated by yellow compound flowers.

Class and order, *Syngenesia Polygamia Necessaria*.

Characters.] CALYX, a compound flower, having a simple, hemispherical, many-parted cup. COROLLA, a compound radiated flower, of many small florets, being funnel-shaped, males in the disk or middle, and flat tongue-shaped females in the radius. STAMINA, in the males, five very short filaments, and cylindric antheræ. PISTILLUM, in the females, a globular germen, slender style, and an emarginated stigma. PERICARPIUM, none; in each female floret a single seed, as hard as bone.

The plants of this genus are mostly natives of Africa, and require shelter of a green-house here in winter.

The species of most note, are

1. OSTEOSPERMUM *moniliferum*.

Moniliferous African Osteospermum.] Hath a shrubby stem, branching six or eight feet high, having a smooth gray bark; oval, serrated, thick, hoary, alternate leaves, on decurrent foot-stalks; and the branches terminated by clusters of yellow flowers.

2. OSTEOSPERMUM *pisiferum*.

Pisiferous Cape Osteospermum.] Hath a shrubby stem, branching seven or eight feet high, having soft woolly branches; spear-shaped, pointed, serrated, smooth leaves, on very short, bordered foot-stalks; and the branches terminated by clusters of yellow flowers.

3. OSTEOSPERMUM *spinosum*.

Spinous African Osteospermum.] Hath a low shrubby stem, branching three or four feet high, armed with branchy spines; oblong, narrow, clammy leaves, placed irregularly; and the branches terminated by yellow flowers singly.

4. OSTEOSPERMUM *polygaloides*.

Polygaloid Ethiopian Osteospermum.] Hath a shrubby stem, branching four or five feet high; spear-shaped, entire, smooth, decurrent leaves, placed almost imbricatum; and the branches terminated by yellow flowers singly.

5. OSTEOSPERMUM *cæruleum*.

Blue-flowering African Osteospermum.] Hath a shrubby stem branching three or four feet high, winged leaves with pinnæ dentated, and branches terminated by sky-blue flowers.

All these *Osteospermums* are durable in root, stem, and branches, retaining their leaves most part of the year: the first sort is that which is the most common in the English gardens. They flower in summer; the flowers are universally compound and radiated; rarely succeeded by good seeds in England.

The plants must always be kept in pots for moving to shelter of a green-house in winter, and managed as myrtles and other green-house shrubs.

Their propagation is by cuttings any time in summer. Chuse the young shoots, which plant in pots, several in each, giving water and occasional shade, for a month or six weeks, when they will be rooted; and before winter should be potted off separately, and placed among the other green-house exotics.

OSYRIS, Poet's Cassia. Of this genus is one low shrubby species of France and Italy, retained in our shrubby collections; a resident of stony, rocky, and sandy places, requiring a similar situation in its garden culture.

Class and order, *Diæcia Triandria*.

Characters.] Male, CALYX, monophyllous turbinated, and cut into three segments. COROLLA, none. STAMINA, three very short filaments, and small roundish antheræ. Female, the calyx and corolla, as the male. PISTILLUM, a roundish turbinated germen, under the calyx, short single style, with a stigma divided into three spreading segments. PERICARPIUM, a globular, umbilicated, unilocular berry, containing the seed, which is a globular

lar officulum, filling the pericarpium, and as hard as a stone.

Species is,

OSYRIS alba.

[*White Osyris*, or *Poet's Cassia*.] A low shrubby stem, branching two feet high, adorned with long, narrow, acute-pointed, bright-green leaves; and small whitish yellow, or yellowish-green flowers, succeeded by middle-sized, roundish berries, ripening of a bright-red colour: flowering in June.

This small shrubby exotic is retained in our gardens for variety, and for the beauty of its fruit; is generally propagated by sowing the berries in autumn as soon as ripe, in some gravelly, stony, or similar situation, on the side of some rising ground, which may either be in the places where intended the plants are to remain, as the most successful, or in a nursery-bed for transplanting; and as the seeds often remain two years before they vegetate, keep the places clear from weeds, during that interval, till the plants appear, and afterwards as occasion requires.

OTHONNA, African Ragwort.

The plants of this genus are shrubby and under-shrubby ever-green exotics of Africa, for the green-house, rising from about two to four or five feet high, ornamented with pinnatifid and entire spear-shaped leaves, and the branches terminated by compound radiated yellow flowers.

Class and order, *Syngenesia Polygamia Necessaria*.

Characters.] CALYX, a compound radiated flower, having a single monophyllous cup, divided into eight or twelve parts. COROLLA, a compound radiated flower, of numerous small florets, the middle or disk composed of many tubular male florets, and the ray of eight or twelve flat, tongue-shaped, tridented, female florets. STAMINA, in the male florets, five short filaments, and long cylindric antheræ. PISTILLUM, in the females, an oblong germen, slender style, and a simple bifid stigma, large and reflexed. PERICARPIMUM, none; each female floret is succeeded by one oblong seed, crowned with down, lodged in the permanent calyx.

The most noted species are,

1. OTHONNA *pectinata*.

[*Pectinated-leaved Othonna*.] Hath a shrubby stem, branching numerously two or three feet high, the branches covered with a hoary down; oblong, pinnatifid, hoary, white leaves being cut pinnatifid-wise almost to the midrib, into many narrow parallel segments, arranged in a pectinated manner, or resembling the teeth of a comb; and at the axillas and

ends of the branches long pedunculi, terminated by large yellow flowers, with spreading rays.

2. OTHONNA *abrotanifolia*.

[*Abrotanum-leaved Othonna*.] Hath a low, shrubby, jointed stem, branching about two feet high; thick, finely multifid-pinnated, southernwood-like leaves; and the branches terminated by yellow flowers.

3. OTHONNA *coronopifolia*.

[*Coronopus-leaved Othonna*.] Hath a shrubby stem, branching four or five feet high; spear-shaped, narrow lower leaves, the upper ones sinuated and indented; and the branches terminated by umbellate clusters of yellow flowers.

4. OTHONNA *cheirifolia*.

[*Cheiri-leaved creeping African Ragwort*.] Under-shrubby creeping rooting stalks, and spear-shaped trinervous entire leaves.

5. OTHONNA *bulbosa*.

[*Bulbous African Ragwort*.] With herbaceous-like and shrubby stalks; oblongish, wedge-shaped, naked, petiolated leaves; and long peduncles, sustaining each one flower.

Varieties.] Egg-oval leaved—spear-shaped leaved—spear-elliptic leaved—linear-leaved—radical-pinnated-leaved—shrubby, with spear-pointed leaves.

These shrubs flower in summer and autumn: the flowers are in general compound and radiated, continuing in succession two or three months, but are rarely succeeded by good seed in our gardens.

They are proper furniture for the green-house collection, and being tender must always be kept in pots for moving to shelter in winter; they will have a very pretty effect in this collection, both by their mode of growth, leaves, and flowers: managing them generally as directed for other shrubby exotics of the green-house. See GREEN-HOUSE PLANTS.

Their propagation is by slips and cuttings of the young shoots, planted any time in summer, before the latter end of July, either in pots, or in a bed or border, watered and shaded occasionally from the sun, till rooted, which they will effect the same season; or if they are covered close with hand-glasses and shaded, it will facilitate their rooting: early in autumn pot them separately, and manage them as other green-house shrubs.

OXALIS, Wood-sorrel.

This genus furnishes several perennial herbaceous plants, some hardy for the flower-borders, and others for the green-house collection; producing large five-parted flowers.

Class and Order, *Decandria Pentagynia*.

Characters.] CALYX, an acute, very short five-parted cup. COROLLA, five-parted, cohering by their claws, erect, obtuse, and emarginated.

ginated. STAMINA, ten capillary filaments, topped with roundish furrowed antheræ. PISTILLUM, a five-angled germen, with five slender styles and blunt stigmata. PERICARPIUM, a five-cornered capsule, with five cells containing roundish seeds.

The most material species are,

Hardy kinds.

1. *Oxalis acetosella.*

Common Wood-sorrel.] Hath scaly jointed roots; from the crown of which arise ternate leaves, composed of three heart-shaped pilose folioles on long slender footstalks; the flowers come out on long footstalks, each supporting a large white flower.

Variety.] With a purple flower.

2. *Oxalis stricta.*

Erect American Wood-sorrel.] Hath an erect herbaceous stalk, eight or nine inches high; the leaves are composed of three lobes, and the flowers come out in an umbel upon long slender footstalks.

The first species is a native of England, and will thrive in any shady place; and, if the seeds of both sorts are sown in any shady situation, plenty of plants will arise for a supply without much trouble.

Tender Green-house kinds.

3. *Oxalis purpurea.*

Purple Wood-Sorrel.] Hath a roundish bulbous root; the leaves are ternate, composed of pilous heart-shaped folioles, standing on long footstalks; from between the leaves arise the footstalks, each supporting a large purple flower.

4. *Oxalis caprina.*

Goat's-foot Wood-Sorrel.] Hath a bulbous root, with smooth ternate leaves on slender footstalks; the flowers are yellow and large, growing in umbels on long footstalks.

5. *Oxalis versicolor.*

Various-striped flowered Wood-Sorrel.] Hath a brown bulbous root, with an erect hairy stalk supporting ternate leaves, composed each of three linear stiff folioles indented at their ends, and on slender footstalks; the flowers are supported by slender peduncles, each terminated by a pale-coloured flower, striped on the back edge of the petals with a lively red, and when the flower is not expanded, give it a very elegant appearance.

6. *Oxalis incarnata.*

Flesh-coloured Oxalis.] The stalk somewhat branchy, bulb-bearing trifoliate leaves in whorls, having heart-shaped lobes, and peduncles with purplish-whitish flowers.

7. *Oxalis flava.*

Yellow Wood-Sorrel.] With leaves trifoliate, the lobes divided in two, and footstalks having one yellow flower.

Propagation.] The last five species are increased by off-sets from their bulbous roots (which are produced in tolerable plenty) at the time when the leaves are decayed, planting two or three off-sets in a separate pot of good light mould, and plant them in the greenhouse, or under a frame of glass during the winter.

P.

P Æ O

PÆONIA, Peony.

This genus furnishes large herbaceous flowery perennials, mostly of the tuberous-rooted kind; having roots composed of large fleshy tubers, sending up strong annual stalks, from one or two to three feet high, garnished with large, many-lobed, spreading leaves, and terminated by very large, pentapetalous, polyandrious flowers.

Class and order, *Polyandria Digynia.*

Characters.] CALYX, five roundish, concave, reflexed, equal leaves. COROLLA, five large, roundish, concave, spreading petals.

P Æ O

STAMINA, numerous short capillary filaments, and large, oblong, quadrangular, erect antheræ. PISTILLUM, two or three downy germina, no styles, but oblong, compressed, obtuse, coloured stigmas. PERICARPIUM, two or three oval-oblong, spreading, reflexed, downy, univalvular, unilocular capsules, having many oval seeds.

There are only two species common to our gardens; one of which, however, common Peony, admits of many elegant varieties, with both single and double flowers; but the doubles being remarkably large, and the petals multiplied

multiplied in many series to the very centre, are considerably more beautiful and estimable than the singles, which have only five petals, according to their characteristic description; but the petals are innumerable in the double varieties, forming a fine full flower, much larger than the biggest double rose.

The species are,

1. *PÆONIA officinalis*.

Common Officinal Peony.] Hath a large root, composed of many thick fleshy tubers, hanging by strings to the main head, upright, round, robust, smooth stalks, branching half a yard or two feet high, or more; garnished with very large, many-lobed leaves, composed of oblong-oval folioles, spreading widely all around, and the stalk and branches terminated by large deep-red flowers singly, having numerous stamina, with yellow antheræ; succeeding to so many capsules, opening longitudinally, and discover their seed, gradually ripening to a dark-purple, or blackish colour. Flowering in May and June.

Of this species there are two noted varieties, called Male Peony, and Female Peony; each of which comprehending also some varieties, viz.

Male Peony.] Hath lobated, dark-green leaves, having large oval folioles cut on the sides, and very large, single, red flowers, succeeded by capsules remarkable for turning backward, opening and displaying their red inside, together with the numerous seeds in a singularly agreeable manner, appearing very ornamental after the flower is past.

Female Peony.]—Hath unequally lobated pale-green leaves, with narrow lobes, more frequently cut on the edges, and smaller deep purple flowers.

Of these two principal Varieties are the following,] Double red-flowered—double deep-red-flowered—double purple-flowered—double rose-coloured—double white-flowered—double black-flowered—Portugal deep-red sweet-scented Peony—Constantinople large blood-red Peony—dwarf white Peony.

All these sorts, considered as flowery plants, are very ornamental in their flowers, particularly the doubles.

The plants have also great merit for medical uses.

2. *PÆONIA tenuifolia*.

Small Narrow-leaved Peony.] Hath a thick, fleshy, creeping root; upright unbranching stalks, rising a foot and a half high; smallish multipartite leaves, having the lobes divided into a multitude of narrow segments, and the stalks terminated by red flowers placed singly.

Both these species of *Pæonia*, and all the varieties, are perennial in root, but annual in stalk and leaves; rising in spring, form large bushy plants, having the flowers erect in the midst of them; and wholly die gradually to the ground at the approach of winter.

They flower in May and June, continuing in beauty a month or six weeks: the flowers are very large in the first species and varieties; and in their single or characteristic state, in all the sorts, consist of five large roundish petals; but in the doubles the petals are multiplied in many series inward to the centre, forming very large full flowers, which in most of the sorts are succeeded by plenty of ripe seed in autumn, by which the plants may be raised in the common ground in great abundance, as well as by off-sets of the roots. See their *Propagation*.

All the sorts are hardy plants that will flourish in any common soil of a garden in almost any situation, either in open exposures, or under shade of trees, &c. and will abide by the roots a great number of years, flower annually, and increase exceedingly by off-sets for propagation.

They are proper ornaments as flowery plants, for large borders and other compartments, and may be had at all the public nurseries. Observing that the best season for removing them is in autumn, when their stalks and leaves are decayed; planting one here and there in different parts, placing them with the crown of the root a little within the surface of the earth, and at a yard at least distance from other plants, for they extend themselves widely every way, assuming a large bushy growth; which, together with their conspicuous large flowers, exhibit a fine appearance, and are often planted at the termination corners of large borders adjoining principal walls, displaying a bushy growth in their foliage and flowers.

After the flowers are gone, the capsules opening lengthways, discover their coloured seeds very ornamentally, especially that called the Male Peony and varieties; and to forward this, may slit the capsules open on the inside at the proper valve, whereby they will expand much sooner, and display their beautiful red seed.

The plants may be suffered to remain several years unremoved, till the roots are increased into very large bunches, and may then be taken up, when the stalks decay, in autumn, divided and replanted, in their allotted places, as above.

Their Propagation, &c.

Their propagation is effected most commonly

monly by dividing the roots; but they may also be raised abundantly from seed.

By dividing the Roots.—The roots multiply fast by off-sets; and the best time for removing and separating them is August and September. When the stalks are decayed, then the whole root may be taken up and divided, each slip or off-set having at least one eye or bud at its crown, will make a proper plant. I would not, however, advise dividing them into very small slips, unless when as great an increase as possible is wanted: in which case they may be divided as small as may be, provided each set is crowned with one or more buds; and in either case it is advisable they be all planted again soon after; for although these roots, if removed at the proper time as above, may upon occasion be kept out of the ground some time, yet when planted again soon after their removal, they will flower much stronger; observing, you may plant the larger off-sets at once where they are to remain; and the smaller ones in nursery-beds to stand a year or two to gain strength, then transplanted into their places of final destination.

By Seed.—All the single-flowered kinds in particular produce plenty, and from which both single and double-flowered plants are obtained. Autumn, soon after the seed is ripe, is a very successful season for sowing; though it may also be performed in spring, and may be sown in any bed or border of light earth, either by broad-cast, and raked in, or in shallow drills, six inches asunder, covering the seeds half an inch deep: they will readily come up in April or May; keep them clean from weeds, and give moderate waterings in dry weather; and as it is proper they should remain two seasons in the seed-bed, it is advisable in autumn to spread an inch depth of light earth over the surface of the bed: the next year, in September, transplant them where they are to remain.

PANAX, Genseng.

This genus comprises herbaceous and shrubby perennials, of China and Tartary, much celebrated as valuable medicinals, by the natives of those countries, as a sovereign remedy for all disorders; retained in our gardens for variety; some hardy for the open borders, and one tender for the stove; all of low growth, garnished with quinate, trifoliate and ternate leaves; and terminated by umbels and loose spikes or bunches of pentapetalous florets.

Class and order, *Polygamia Diœcia*.

Characters.] *Hermaphrodite*. CALYX, the flowers in a close equal umbel, having an in-

volucrum, composed of several awl-shaped; permanent leaves, and a small proper cup. COROLLA, the general flower uniform, the florets formed each of five oblong, recurved petals. STAMINA, five filaments, and single antheræ. PISTILLUM, a roundish germen, under the corolla, two styles, with simple stigmas. PERICARPIUM, a heart-shaped, umbilicated, bilocular berry with two seeds, *Male*. CALYX, a single, round umbel, with an involucrum, composed of several spear-shaped, sessile folioles, and a turbinated, entire, coloured perianthium or cup. COROLLA, five oblong, narrow, obtuse, reflexed petals, attached to the cup. STAMINA, five filiform filaments, with simple antheræ.

Of this genus, three species are retained in our gardens; viz.

Two hardy herbaceous Perennials.

1. PANAX *quinquefolia*.

Five-leaved Genseng.] Hath a taper, fleshy root, brownish without, yellow within, from which rises an upright, reddish stalk, about a foot high, dividing above into three or four branches, garnished with quinate, high-green leaves of five spear-shaped, serrated, hairy folioles; and flowers terminating the branches in an umbel, appearing in June, succeeded by ripe seeds in August.

2. PANAX *trifoliata*.

Three-leaved Genseng.] Hath a small, taper, fleshy root, trifoliate leaves, deeply cut on the edges; and footstalks, supporting terminal bunches of small greenish flowers.

Tender Shrubby kind for the Stove.

3. PANAX *aculeata*.

Prickly Shrubby Genseng.] Rises with a shrubby stem, dividing into branches, armed with recurved prickles, at the base and top of the petiole; garnished with ternate, or trifoliate-leaves, and flowers produced in bunches, near the extremities of the branches.

The first and second species are hardy, herbaceous perennials cultivated in our gardens for variety, and occasionally as medicinal plants, being of great estimation in China as a universal medicine, the roots being the useful parts, are of an agreeable, bitter flavour, and when chewed, diffuses an agreeable warmth over the whole body, and is affirmed to be a sovereign restorative, and great strengthener: they are propagated in our gardens by sowing the seeds in the spring, in a moderate hot-bed: and when the plants are come up two or three inches in growth, transplant them into a bed or border of light good earth, to remain.

The third species is a tender shrubby plant, requiring

requiring a constant residence in the stove: it is propagated by layers and cuttings in the summer months.

PANCRATIUM (*Pancratium Lily*) Sea Daffodil.

This genus consists of large bulbous-rooted, herbaceous, flowery perennials, of very ornamental appearance for the pleasure-ground and stove collection, having very large bulbous roots, crowned with long leaves, some very narrow, others broad; and upright robust flower-stalks, from one to two or three feet high, terminated by a large spatha, or sheath, protruding some many, others but one or two, hexapetalous, lilaceous, white flowers, of great beauty and fragrance.

Class and order, *Hexandria Monogynia*.

Characters.] **CALYX**, an oblong spatha, opening on one side, protrudes many flowers, and withers. **COROLLA**, six spear-shaped petals, and in the middle a monopetalous, funnel-shaped nectarium, ten or twelve-parted, and spreading at top. **STAMINA**, six awl-shaped filaments inserted into the brim of the nectarium, and oblong incumbent antheræ. **PISTILLUM**, an obtuse trigonal germen under the corolla, long filiform style, and an obtuse stigma. **PERICARPIUM**, a roundish, trigonous, trilocular capsule, having many globular seeds.

Of this genus there are two hardy species for the pleasure garden, and five tender kinds for the stove.

Hardy Kinds.

1. **PANCRATIUM** *maritimum*.

Common Sea Daffodil.] Hath a very large, oblong, bulbous, dark-coated root, crowned with tongue-shaped leaves a foot long, encompassed at bottom with a sort of sheath; amidst them an upright, robust, naked flower-stalk, a foot and a half high, surmounted by a multiflorous spatha, protruding several large white flowers, having plane petals. Flowering in the latter end of August or in September.

It grows naturally on the sea-coast of France and Spain.

2. **PANCRATIUM** *illyricum*.

Illyrian Multiflorous Pancratium.] Hath a large, oval, bulbous, dark-coated root, crowned with sword-shaped leaves, a foot and a half long, and two inches broad; an upright, thick, succulent, naked flower stalk, near two feet high, terminated by a multiflorous spatha, protruding six or eight white flowers, having the stamina longer than the nectarium. Flowering in June and July.

Both these hardy *Pancratiums* prosper in the open ground, but must have a warm dry si-

tuation, and a light soil, and sheltered occasionally from severe frost, where they will abide for many years by the root, renewing their leaves and flower-stalks annually, and increase freely by off-sets.

Tender Kinds for the Hot-House.

These sorts being tender exotics from the warm parts of the Indies, in this country must be kept in pots, in order for being placed always in the hot-house, where they will exhibit their beautiful fragrant flowers at different times of the year.

3. **PANCRATIUM** *zeylanicum*.

Ceylon Uniflorous Pancratium.] Hath a large oval, bulbous root, crowned with narrow erect leaves, a foot long; an upright, firm, naked flower-stalk, fifteen or eighteen inches high, terminated by a uniflorous spatha, protruding one large white flower, having reflexed petals.

4. **PANCRATIUM** *mexicanum*.

Mexican Biflorous Pancratium.] Hath a large bulbous root, crowned with furrowed leaves, a foot long, and two or three inches broad; an upright naked flower stalk, about a foot high, terminated by a biflorous spatha, protruding two large white fragrant flowers.

5. **PANCRATIUM** *caribbæum*.

Caribbæan Multiflorous Pancratium.] Hath a very large bulbous root, crowned with spear-shaped, moderately-broad, longitudinally-ribbed leaves; an upright, thick, firm, naked flower-stalk, two feet high, or more, terminated by a multiflorous spatha, protruding many very large, white fragrant flowers.

6. **PANCRATIUM** *amboinense*.

Amboyna Broad-leaved Multiflorous Pancratium.] Hath a large, oval, white bulbous root, crowned with oval, nervous, or deeply ribbed leaves, seven or eight inches long, and five or six broad, growing on short foot-stalks; and an upright, thick, naked flower-stalk, near two feet high, terminated by a multiflorous spatha, protruding many large white flowers.

Variety.] With broad, oval, acuminate leaves, and very fragrant flowers.

7. **PANCRATIUM** *carolinianum*.

Carolina Multiflorous Pancratium.] Hath a roundish, bulbous root, crowned with very narrow leaves, a foot long; and an upright, robust, naked flower-stalk, eight or nine inches high, terminated by multiflorous spatha, protruding several flowers, having the stamina as long as the nectarium.

All these plants are perennial in root, but annual in stalk, which always decay soon after the flower is past.

Their season of flowering is different: the two

two hardy sorts flower here pretty constantly at the times mentioned in their description; and as to the tender kinds, they often exhibit their flowers in our stoves in the middle of winter, sometimes in spring, summer, and autumn; and sometimes they flower two or three times a year, so that one or other of them exhibit flowers at almost all seasons. The flowers of all the sorts consist each of six petals, and a monophyllous nectarium in the centre, all are very ornamental, and most of them exceedingly fragrant; but rarely any of the sorts, except the *Pancratium illyricum*, furnish ripe seeds in these parts.

They all increase in tolerable plenty in root by off-sets for propagation.

All the sorts have great elegance in their flowers, and most of them are enriched with a delightful fragrance, and demand our attention for culture in the pleasure-garden and stove.

The two hardy sorts are proper for the pleasure-garden, but should have a warm dry situation, and light soil: the season for planting them is autumn, that is, the roots being taken up when their leaves decay, should be planted again soon after; placing them three or four inches deep, and they will flower the year following; suffering the roots to remain unremoved two or three years; when they will be increased by off-sets, and should be taken up and separated. See their *Propagation*.

Observe, in severe frosts it will be proper to cover the ground over the roots with litter, to protect them.

The five tender species must be planted in large pots, and placed in the hot-house: the season for planting and transplanting them is when their leaves decay; observe this, and plant one root in each pot, which plunge in the bark-bed of the stove, where let them always remain; and here they will flower strong at their usual seasons, and multiply exceedingly by off-sets.

Propagation of all the Sorts.

All the sorts are propagated by off-sets of the root, like other bulbs, which may be separated every second or third year, or according as they multiply; the proper time for which is when their leaves decay; planting the off-sets of the hardy sorts in nursery-beds for a year, then transplanted where they are to remain; and those of the tender kinds plant in separate pots, plunging them in the bark-bed. Those of all the sorts will flower, some probably the first season, but all in good perfection the second year, and in their turn furnish a proper supply of off-sets for increase.

PANDANUS, Screw Pine.

Consists of a curious stove exotic of herbaceous, perennial growth, rising with numerous, long, pointed leaves, and dicecious apetalous flowers.

Class and order, *Diœcia Monandria*.

Characters.] CALYX, male and female flowers on separate plants, the male consisting of alternate sessile spathæ, with erect, oblong, pointed, sessile antheræ, inserted on the ramifications of the thyrsæ; the female consists of four connivent terminal spathæ, with globose spadix, containing a number of fructifications. There is no corolla. The PISTILLUM contains a number of five-angled, sessile germina. Style, none; but two marginated, heart-shaped stigmas. PERICARPIUM, a large, globose, compound fruit with oval solitary seeds.

There is only one species, viz.

PANDANUS *odoratissimus*.

Sweet-Scented Pandanus, or Screw Pine.]

Hath a fibry, thick, perennial root, crowned by many pointed, serrated leaves, four or five feet along, arising from the root, growing in a screw-like manner towards the top, where they become more erect; the whole plant is like the ananas, but larger, and makes a most noble appearance: it has not produced flowers in England: but as these are not conspicuous, the beauty of the plant consists in its large spreading foliage.

It is a native of the East Indies, and is propagated by seeds brought from thence: these must be sown in pots, and plunged in the hot-bed, and kept constantly in the bark-bed in the stove.

PANICULA, Panicle; a mode of flowering, in which the common flower-stalk branches into several smaller, dispersed along its sides; and these smaller ones are again variously sub-divided into others; each division supporting flowers and fruit, hanging loosely: such as a head of oats, and many other plants.

A Panicle is of two sorts, diffuse, and coarctate.

A diffuse Panicle (*Panicula diffusa*) is when the partial flower-stalks, or pedicles, diverge, and the fructifications hang loose, so as to form in the whole a spreading loose panicle.

A coarctate Panicle (*Panicula coarctata*) is when the pedicles approach pretty close together, so as to form a narrow straight panicle.

PAPAYER, Poppy.

The plants of this genus are hardy, herbaceous, fibrous-rooted, flowery plants; principally annuals and perennials, for ornament in gardens, and for medicinal use; rising with upright stalks, from one to three feet high,

garnished with large, deeply-jagged, and pinnatifid leaves, and terminated by large tetrapetalous polyandrous flowers.

Class and order, *Polyandria Monogynia*.

Characters.] CALYX is oval, and composed of two oval, concave, indented leaves, that soon fall off. COROLLA, four large, roundish, plane, spreading petals. STAMINA, numerous shortish filaments, and oblong, compressed, erect antheræ. PISTILLUM, a large roundish germen, no style, but the germen crowned by a target-shaped, plane, radiated stigma. PERICARPIUM, a very large, roundish, or oval, unilocular capsule, crowned with the plane stigma, opening under it in several places, and is filled with numerous very small seeds.

There are eight or nine species, and of which four only have claim to attention as garden plants; two annuals, and two perennials: the two former of which comprise many varieties in respect to the size, various colourings, variegations, and doubleness of their flowers, some of which are very beautiful, though all of them rather of a disagreeable scent, and of short duration: the plants, however, are designed by nature for excellent purposes in medicine; and both the annual and perennial kinds may be employed to increase variety in the pleasure-garden; they are all very hardy and prosper any where.

Annual Kinds.

1. PAPAVER *somniferum*.

Somniferous common Garden Poppy.] Rises with an upright smooth stalk, dividing and branching a yard or more high, garnished with large, deeply-jagged, amplexicaule smooth leaves, and terminated by large, spreading, dark-purple, and other coloured flowers in the varieties, having smooth cups and capsules. Flowering in June and July.

The varieties of this species are numerous; many of which have great beauty, both in their amazing size, doubleness, and colourings.

Varieties of this are,] White-flowered officinal Poppy, or Maw-seed—white-seeded officinal Poppy double purple-flowered—double red-flowered—double white-flowered—double variegated purple-and-white-flowered—double variegated red-and-white flowered—double red-and-white spotted-flowered, or carnation Poppy—double curled-flowered—double fringed-flowered—double feather-flowered—and also with single flowers of each sort.

Observe that as there are both single and double flowers of all the above varieties, the singles having only four petals, have no merit as garden flowers; but the double kinds being

very large, and the petals numerous, forming a handsome full flower, exhibit a good variety in a garden: the flowers, however, are but of very short duration, and in general of a disagreeable scent.

Most of the varieties of this species are of a somniferous nature, i. e. causing sleep: hence it is termed PAPAVER *somniferum*.

The white officinal Poppy, a variety of this species, is the principal medicinal sort; it often grows five or six feet high, having large flowers, both singles and doubles, succeeded by very large heads, or capsules, as big as oranges, filled with very numerous seeds (about 8000); and the heads are greatly used in medicine; of which is made the *diacodium* of the shops; likewise from the heads is extracted the *opium* in Turkey; and any part of the plant boiled in water, and sweetened with sugar, causes sleep, but should be used with caution, because too large a quantity brings on death. The seed is also good in fevers and inflammatory disorders; so that this variety in particular is propagated in great plenty for supplying the shops.

All the varieties are raised commonly from seed in the open ground.

2. PAPAVER *Rhæas*.

Wild, or Dwarf Corn Poppy.] Rises with an upright, hairy, multiflorous stalk, branching a foot and a half high, garnished with long, pinnatifid, deeply-cut, hairy leaves, and the stalk terminated by many red and other coloured flowers in the varieties; succeeded by globular smooth capsules. Flowering in June.

This species is the wild red Poppy of the corn fields, but being improved by garden-culture, many varieties of the flowers of different beautiful colours, and exceeding doubleness, have been obtained.

Varieties are,] Double red-flowered—double purple-flowered—double white-flowered—double variegated flowered, or dwarf carnation Poppy, of many fine-coloured varieties—and with single flowers of all the above colours and variegations.

Of the above varieties of this species, the double kinds only merit attention as flower-plants; the variegated sorts in particular are very beautiful; but all the flowers of the varieties, like those of the somniferous kinds, are but of short duration.

Perennial Kinds, with durable Roots, but annual Stalks.

3. PAPAVER *cambrium*.

Cambrian, or Welch Poppy.] Hath a perennial root, crowned with pinnated, cut leaves; upright, smooth, multiflorous stalks, a foot and

and a half high, garnished with small pinnated leaves, and terminated by many large yellow flowers; succeeded by oblong, smooth capsules. Flowering in June.

It grows spontaneously in Wales, and some other parts of Britain.

4. *PAPAYER orientale.*

Oriental Scarlet Poppy.] Hath a large, thick, perennial root, crowned with long, pinnated, sawed leaves; upright, rough, uniflorous stalks, terminated each by one large, deep-red flower; succeeded by oval, smooth capsules. Flowering in May.

Variety.] With double flowers.

All these species of *Papaver* flower principally in June and July, except the oriental kind, which commonly flowers in May: the flowers of all the sorts are large, particularly the annuals, and in their single state consist each of four large, roundish petals; but the double flowers are composed of numerous petals, in several degrees of luxuriance in different varieties, and in all the sorts are succeeded by very large roundish capsules, filled with numerous very small seeds, ripening in autumn.

As to their merit as garden-plants and propagation, observe as follow:

Annual sorts.—Both these sorts furnishing many varieties with ornamental flowers, the doubles of which in particular make a pretty appearance in the compartments of the pleasure-garden, when disposed here and there in patches, so that we should procure seed of the finest doubles only, which may be sown in autumn or spring, at once where the plants are to remain, in patches as above, covering it near a quarter of an inch deep; and when the plants are come up an inch or two high, thin them where too thick, to three or four in each patch; here they will flower abundantly; observing, when the flowers appear, to cut out all such plants whose flowers are of bad colours, and all singles and half doubles; leaving only the fine full double flowers: thus, by preserving only the best flowers, the blow will be ornamental; and will ripen plenty of seed, which, if permitted to scatter, numbers of plants will rise naturally.

The flowers, however, of all these annuals are but of a short continuance, which in very hot weather, are often but of one day's duration, but are succeeded by others on the same plant; the large doubles having numerous petals, they, by falling daily, cause a littering appearance.

When designed to cultivate the somniferous kinds for use, may sow the seed in any open ground, in drills a foot asunder, or by broadcast and rake them in; and when the plants are

three inches high, hoe them out to a foot distance, there to stand to perfect their seeds.

Perennial Sorts.—Both these sorts are employed to form variety in large gardens; they may be placed any where, and plants of both sorts may be procured at the nurseries in autumn or spring, planting them directly where they are to remain.

These two sorts may be propagated by seed, and by parting the roots.

By seed.—Sow it in autumn, or early in spring, in any bed or border, and rake it in; when the plants are three or four inches high, plant them out in nursery-rows to remain till autumn, then transplant them where they are finally to remain, and will flower in summer following.

By Roots.—In autumn, or early in spring, you may slip the roots, preserving fibres to each slip, which planted, become proper plants, and will flower the following season.

PAPER FRAMES, a slight open or skeleton Frame-work of thin slips of wood, covered with oiled paper pasted thereon, and are very useful on several horticultural occasions, principally in summer.

They are a sort of temporary Frames, beneficial in some particular uses, principally in the early and general summer months, or occasionally from the advanced part of spring (April) till the end of August or September, both in defending some late hot-beds, and sometimes in particular natural ground beds of curious tender plants, seeds, cuttings, &c. and which being formed as above, in light, open Frame-work of wood, either in a ridged form manner, with two sloping sides, longways, or arch-fashion, in dimension five to ten feet long, three to four wide, and two to three feet perpendicular height; the wood-work is covered with large sheets of strong white paper pasted on securely, and this, when dry, brushed over regularly with linseed oil, whereby to resist and shoot off the falling wet of rains and dews, and to render it more pellucid to admit the rays of light, and heat of the sun in a proper degree; and is thus, when perfectly dry, ready for placing over the beds, as above, for the purposes required; in which the paper continues durable generally only one season; but the Frame-work will last several years, and may be fresh papered annually.

These kind of temporary Frames are useful on some occasions, in late hot-beds made in April and May, such particularly in some of the hand-glass crops of melons, and occasionally those of cucumbers, but is more generally used in the former, which after having advanced in growth, to fill and extend beyond

the compass of the hand-glasses, in the end of May, or in June, the glasses being then entirely removed away, the Paper-Frames are placed over the bed, covering it therewith wholly in width and length, the runners of the plants being trained out regular along the surface, and the paper of the frames being previously oiled, as before observed, thereby rendered proof against wet, and transparent, or so pellucid as to admit the rays of light, and heat of the sun, are continued constantly over the plants, which are thereby protected from external injuries, of inclement weather, either cold, or excessive rains, winds, &c. likewise from the too powerful heat of the sun, as the paper both admits the light and heat thereof, beneficially, to the prosperous growth of the plants and fruit, and at the same time affords a peculiar agreeable shade from its immediate scorching rays; and by which protection, and the necessary culture of giving fresh air, occasional watering, and covering over the frame with mats, in bad weather, and casual cold nights, the fruit generally sets plentifully, and ripens in good perfection. See *Cucumis Melo*.

Also occasionally for late hot-bed cucumbers, in want of garden-frames, or hand-glasses for that purpose, the above Paper-frames may be wholly used instead thereof, to place over late hot-beds, made the middle or latter end of April and in May, and either seed or young cucumber plants being put in, may place the said Paper-Frames over the bed at once, finally to remain, and with proper care in giving occasional air, water, and covering over the frames with mats in cold nights, and very hard rains, &c. as observed of the melons, may raise cucumbers to cut in tolerable plenty and perfection in May or June and July, though by this same means I have cut very good fruit in May, and the plants continued in production two or three months, till those sown in the full ground in May, or beginning of June, the season for sowing the natural crops, arrived to full bearing in August.

These said Paper-Frames might also be employed occasionally, in default of others, in the culture of raising most of the less hardy or tenderer annuals which are arranged in the second class under the article *Annual Plants*; both in sowing them in hot-beds and warm borders of natural earth, in April, &c. to forward the plants for transplanting into borders, beds, and pots, in the middle or latter end of May and in June.

Likewise Paper-Frames may be used advantageously in pricking-out many sorts of small tender seedling plants in the hot summer months, which will both defend them from casual unfavourable night air, heavy rains, &c.

and afford a fine growing shade from the hot rays of the mid-day sun.

The same kind of Frames would be beneficial in raising many sorts of tender exotics from small cuttings and slips in summer; both of the woody kinds, herbaceous and succulents, either planted in hot-beds, or some sorts in the natural earth, as the different kinds may require, and being covered close with the said Paper-Frames, they exclude the outward air, admit the light and influence of the sun in a proper degree, and at the same time, as before observed, gives a peculiar kindly shade to the cuttings most beneficially from its immediate scorching heat, so as in the whole they will more freely emit roots in the earth, and shoots above in proportion, which should, in their advancing growth, have fresh air admitted, less or more, according to the temperature of the respective plants.

Thus from the foregoing intimations respecting Paper-Frames, it may be observed, they are adapted to be employed on several useful occasions; and their construction is simple, easy and cheap, so as every one may readily make them according as wanted.

In their construction, they may either be formed ridge shaped, like the roof of an house, or archways, like the tilt or cover of a waggon, each of the length, width, and height before suggested; framed of thin slips of deal, and lath, or, if the arched form, with broad hoops; though those made ridge-form, with two sloping sides, longitudinally, five to ten feet, according to the length intended, are rather the most eligible; in either of these forms the Frames are constructed in an open manner, having the ribs or spars twelve inches asunder, first forming a bottom frame, rather stronger than the other parts, and of the proper length and width, as above, with a ridge-piece supported at a proper height, extending longways the middle, then narrow side rafters, arranged from the bottom to the ridge rail at top, a foot distance, as above observed, both for the advantage of pasting the paper regularly, and to admit a proper degree of light between them, through the paper; but generally observing, if long frames, of ten feet, it would be proper to have one or two pannels on one side, eighteen inches or two feet width, to open outward with hinges, convenient for admitting air, and performing other occasional culture; and, the whole being thus formed in the wood work, it is then proper to extend lines of packthread cross-ways the ribs, going round each, level or even with the upper surface of the frame, continuing two or three rows a foot asunder, from the lower part

part upward, drawing other lines, crossing and intersecting these first at the same distance, regularly between the ribs of the frame-work, which arrangement of the lines, is of essential service for the more effectual support of the paper when pasted on the Frame, and strengthen it against the power of winds and heavy rains; and this completes the formation of the frame ready for papering.

The paper for this purpose should be of the larger strong printing or demy kind; which, previously to pasting on the frame, should be moderately damped with water, that it may not sink in hollows after being fixed; and as soon as thus prepared, proceed to paste it on, sheet and sheet, in a regular manner; one large sheet and a half, or two at most, will generally range from bottom to top, or commonly contrive to have whole ones along the ridge-rail above, extending lengthways and across, placed convenient, to join regularly with the other sheets below, pasting the whole in the most regular and secure manner to the rails, ribs, and packthread; and, if, at the intersections of the latter, a small square or round bit of the same paper is pasted on the inside to the main sheets over that part of the pack-thread, it will give it additional strength against rain and wind.

After the Paper is thus pasted on, and is perfectly dry, then it must be oiled over with linseed oil, either raw or boiled: the latter I think is rather apt to harden the paper, more liable to crack or break; having, however, the oil, and a soft and clean painter's brush, dipping this in the oil moderately, and with which lightly brush the outside of the paper all over, equally in every part; which done, place the frame in some dry covered shed, to remain till the whole is thoroughly dry, and then it may be used, when wanted, in any of the different occasions before intimated.

As to general utility, and methods of using these oiled Paper-Frames, it is principally as intimated in the foregoing observations, and as occasionally advised in different particular parts of this work, such as in melons, cucumbers, &c.

PAPILIONACEUS *Flos*; a butterfly-shaped flower, such as all the pea-bloom kinds. See **COROLIA** *Papilionacea*.

A Papilionaceous, or butterfly-shaped flower, consists of four or five very irregular petals, and from their figure and position, bear an obvious resemblance in most of the genera, to a butterfly expanding its wings for flight; exemplified in all the sorts of pea, bean, kidney-bean, laburnum, &c.

The different petals of a Papilionaceous

flower are characterised by distinct names; the upper one commonly the largest, and standing erect, is termed the standard, (*vexillum*); the two side petals the wings, (*alæ*); and the lowermost, which is generally concave, and united and divided at bottom, is called the keel, (*carina*), from its resemblance to the keel of a boat; is sometimes of one petal, and sometimes two united.

Plants of the Papilionaceous tribe consist both of herbaceous plants and trees; and are of the class *Diadelphia*, two brotherhoods. See **CLASSIS**.

Some Papilionaceous flowers are of various sizes in different plants; some have very large petals, others middling, and others very small; and some are furnished with the standard only, as in the genus *Amorpha*; and in some the different petals are so situated as to form the appearance of a regular flower, whereby the Papilionaceous, or butterfly-shape, is not very conspicuous; far the greater part, however, have all the proper petals representing the above form.

All the Papilionaceous flowers are hermaphrodite, and have five to ten united stamina, but mostly ten, and generally *Diadelphous*, or of two sets; one set is composed of nine stamina in one crooked body, terminated by nine antheræ; and the second set consists of one filament only, lying along the clift of the large bundle; sometimes separate, or totally distinct, and sometimes pretty closely attached: in the midst is a slender crooked style, crowned by a downy stigma; succeeded by that sort of seed-pod termed legum (*legumen*) such as the pea, bean, kidney-bean, &c. being oblong, more or less compressed, with two valves, and one, two, or more *loculi*, or cells, containing a few seeds of different shapes and magnitudes in different genera, all fastened along one suture, or seam only, alternately to both sides. See **LEGUMEN** and **PERICARPIUM**.

Papilionaceous-flowered plants are very numerous, and consist both of herbaceous plants and trees, as aforesaid: of the former many are trailing or climbing plants, with long weak stalks, and being as it were helpless of themselves, indulgent nature has either provided them with tendrils to climb and fasten themselves to the neighbouring trees and bushes, as in all the sorts of peas; or their stalks are endued with a faculty of twining themselves around the bodies in their neighbourhood for the purpose of support; the climbing sorts of kidney-bean furnish examples; and as to the tree and shrub kinds of this tribe, they obtain in stature, from one yard to sixty or seventy feet. Most of the sorts,

sorts, both of the herbaceous and the shrub and tree kinds, are garnished with alternate leaves of different forms, being either simple, fingered, or winged, but most commonly of this last form, having the lobes entire, and sometimes placed in pairs, as in *lathyrus*, but most commonly the winged leaf is terminated by an odd lobe; and the winged or pinnated leaves of this order, have generally a daily, or periodical motion, depending upon the progress of the sun in his diurnal course. See *MOTUS*.

The principal plants of this tribe are the following, consisting of herbaceous plants and trees.

Amorpha, bastard indigo—*anthyllis*, lady's finger—*ebenus*, ebony of Crete—*erythrina*, coral-tree—*genista*, single-seeded broom—*lupinus*, lupine—*ononis*, rest harrow—*spartium*, common broom—*ulex*, furz or whins—*aschynomene*, bastard sensitive plant—*colutea*, bladder-sena—*coronilla*, jointed-podded *colutea*—*cytissus*, laburnum, base-trefoil, &c.—*glycine*, Carolina kidney-bean-tree—*glycyrrhiza*, liquorice—*hedyсарum*, French honey-suckle—*lathyrus*, everlasting-pea—*lotus*, bird's-foot trefoil—*medicago*, moon and snail trefoil—*orobus*, bitter vetch—*phaseolus*, kidney-bean—*pisum*, pea—*robinia*, false acacia—*scorpiurus*, caterpillar-plant—*trifolium*, trefoil—*vicia*, vetch and garden-bean—*astragalus*, liquorice-vetch, goat's-thorn—*piscida*, Jamaica dog-wood-tree.

Several of the plants of this tribe, or family, furnish food both for men and quadrupeds: the chief esculent sorts for the kitchen-garden are pea, bean, and kidney-bean; the seed of which are the eatable parts, also the young seed-pods of all the kidney-bean kinds.

Many of them are also useful plants for ornamenting gardens, and for many excellent medicinal uses; also many of them are valuable in various trades.

But the particular description of the different genera of this order, together with their uses and general culture, is fully illustrated each under its proper head.

PAPPUS; Down of flowers, or a sort of feathery crown, which adheres to many kinds of seeds, exemplified in lettuce, dandelion, sow-thistle, groundsel, &c.

Many of the Pappose plants produce compound flowers, and their seeds are furnished with a *Pappus* adhering to the top of each, so as to resemble a shuttle-cock, and naturally framed for flying, for the purpose of dissemination or spreading about the seed, and for being transported by the wind to very considerable distances from its parent; an admir-

able contrivance of nature to sow her productions; and thus render common to different soils and territories individuals of the same species, which without such precaution might have been confined to one.

The *Pappus* is either simple, like hairs, *Pappus pilosus*, as in swallow-wort, groundsel, golden-rod, &c. or branched, or compound in a feathered-like manner, *Pappus plumosus*, as in dandelion, hemp-agrimony, scorzonera, and valerian: in some plants the *Pappus* adheres close to the seed, *Pappus sessilis*, as in hawkweed; and in some it is elevated upon a pedicle, or stipes, *Pappus stipitatus*, as in lettuce, dandelion, bastard-hawkweed; and the foot-stalks, or threads upon which it is raised, have obtained the name *stipes*. See *STIPES*.

Of this tribe of Pappose plants are many of our most cumbersome weeds, the seeds of which by the means of the *Pappus* are disseminated widely about our gardens and fields, particularly groundsel, thistle, sow-thistle, and dandelion; therefore the utmost care is requisite to destroy all these kind of weeds before they perfect seeds.

PARASITUS Planta, Parasitic Plants; plants that are produced upon the trunk or branches of other plants, and, in some, will not grow in the ground, such as mistletoe, and numbers of the mosses, and fungus tribe.

The manner in which Parasitic Plants attach themselves to others is not uniform: some, such as the mistletoe, mosses and funguses, are produced originally upon the plant on which they are found growing; the former of which grows upon the branches of large trees, principally from the under side of the branches, extending their roots under the bark, and branch out into a large spreading head, which generally grows downward, in a hanging position; and is nourished wholly at the expense of the tree upon which it grows; but the mosses are often dispersed all over the surface of the stem and branches; and the funguses grow sometimes on the upper roots of old trees, and sometimes upon their trunk or stem.

Other Parasitic Plants arise from the ground, and the stem attaches itself to the first plant it encounters, and strikes root therein; after which the first root dies, and the plant continues to live and nourish itself upon the plant on which it is fixed.

There are other sorts of Parasitical Plants, which rooting first in the ground, their stems attach themselves to the bodies of trees in their neighbourhood, planting their roots into the bark, as they ascend; continuing, however,

ever, their ground-root, and draw their principal nourishment from the soil, exemplified in the *hedera*, or ivy-tree.

PARKINSONIA. This genus consists of an exotic, ornamental flowering tree of the Indies for the stove, garnished with very small leaves, and long bunches of pentapetalous, odoriferous flowers.

Class and order, *Decandria Monogynia*.

Characters.] **CALYX**, a monophyllous cup, divided at the border into five spear-shaped, reflexed, coloured segments. **COROLLA**, five unguiculate spreading petals, four of which are oval, and the lower one kidney-shaped, with a very long erect claw. **STAMINA**, ten subulate filaments, with oblong incumbent antheræ. **PISTILLUM**, a long round declining germen, no style, but an obtuse stigma. **PERICARPIUM**, a very long roundish pod, with swelling joints, each containing an oblong seed.

We know but one species, viz.

PARKINSONIA, *aculeata*.

Prickly Parkinsonia.] With minute leaves, and long slender spikes of yellow flowers.

This tree is a native of the West Indies, where it rises to twenty feet high, or more, but with us it is kept in the stoves for the most agreeable perfume, and beauty of its blossoms.

It is propagated by seeds sown in pots of light rich earth, early in the spring, plunging the pots in a hot-bed, when they will soon come up, and when about two or three inches high, should be carefully taken up and transplanted singly in pots and replunged in the tan or hot-bed, observing to shade them till they have taken fresh root, but they must afterwards be hardened to the open air before winter, when they should be removed to the stove, placing them where there is the least heat.

PARTERRE. a spacious level plot of ground in the pleasure garden, divided into many little partitions, or compartments, of different figures and dimensions; by means of edgings or lines of dwarf-box, or by verges of grass turf, and tracks of sand, fine gravel, &c.

These Parterre works were in great estimation in ancient gardening, and were commonly situated directly in the front of the house, generally the whole width of the front, or sometimes more, and extended proportionably in length; and when the intermixture of the figures are artfully disposed, they strike the eye very agreeably, and afford an ornamental prospect at all times of the year.

The general figure of a Parterre is an oblong, or long square, about as long again as

broad: chusing generally a level open spot on some conspicuous part; and in the distribution, there is first a long bed or border of earth, carried all round for a boundary; and the internal space within this border, is traced out into various little partitions, or inclosures artfully disposed into different figures corresponding with one another, such as long squares, triangles, circles, various scroll-works, flourishes of embroidery, and many other devices, according to fancy; all of which figures are formed either by lines of dwarf-box, with intervening alleys and tracks of turf, sand, fine gravel, small shells, &c. or are formed sometimes entirely of verges of fine turf, disposed into wide or narrow compartments, as the figure may require; and sometimes they consist of box-edgings, and tracks of turf together: the partitions or beds of earth formed by the tracks of box and turf compartments, &c. are planted with some choice flowers; but no large plants to hide the figure of the Parterre; for the regularity of this in the artful distribution of the different figures, is intended as a decoration to the whole place long after the season of the flowers is past.

But many prefer a Parterre composed entirely of turf and beds of earth, perfectly even, without any other figure than the long square, forming a border of earth all round, within which is compartments of grass, and beds or borders of earth of different dimensions:

Sometimes Parterres, by means of box-edgings, are formed into labyrinths or mazes; and some are made to represent coats of arms with the proper supporters. All crowded designs, however, and such figures as are too much compound, are to be considered as so many labyrinths, in which the eye is lost; and therefore improper to be employed for any general plan.

But Parterres in general are now become in disrepute in England, their regularity being thought too stiff and formal, their figures often of a trifling appearance, and their making and keeping in proper order attended with considerable trouble and expense, so that they are almost banished the English gardens; substituting, in their stead, spacious grass lawns and rural shrubberies.

However, a little Parterre-work for the sake of variety, might still be admitted, though not immediately in the front of the house, as heretofore in ancient gardening. A spacious lawn, bounded with a rural shrubbery, is the most eligible for that situation; but a plain Parterre of a moderate extent, either formed with lines of box, or with turf, might

might be introduced in some of the more internal parts, and distributed into plain compartments, or beds of earth for flowers, so as to answer the purpose of a flower-garden for the most curious sorts; it will have an agreeable effect in forming a contrast to the more rural scenes.

PARTING ROOTS, an expeditious mode of propagation, for the increase of great numbers of fibrous-rooted perennials in particular.

Great numbers of the herbaceous, fibrous, and tuberous-rooted perennial tribe often increase by the root into large clusters or bunches, composed of numerous small slips or off-sets, particularly many of our flowery perennials, such as campanula, perennial sunflower, golden-rod, perennial asters, polianthus, and daisy, balm, mint, burnet, cives, and penny-royal, with innumerable other sorts; which from one small slip or off-set of the root often multiply in a season or two into a large cluster of such off-sets, and these clusters of roots being parted into several separate slips, with root-fibres at their bottom, and one or more buds at top, each commences a distinct plant; so that by thus Parting the Roots you may instantly multiply one plant into many, each of which becomes alike in growth and general habit to the original, and will all flower the ensuing season in their due course; and in their turns detach from their sides all around, a due supply of off-sets for farther propagation.

The sorts of plants that are usually increased by this mode of propagation are principally numerous sorts of our flowery perennials, many medicinal plants, and several of our kitchen-garden herbs, all which, in the different sorts, are always mentioned in their respective genera under the head *Propagation*, &c.

The best general season for Parting Roots is in autumn, after they have done flowering, and their stalks decay, which is done in August, September, and October, and the detached off-sets being planted directly, they will take good root before winter; though, in many hardy sorts, Parting the Roots may be performed almost any time, in open weather, from September till March; and some of the tender kinds succeed best in spring; or may be performed to almost any sorts, hardy and tender, in that season: observing, however, in Parting Roots in the spring, it should be done before they begin to shoot forth their stalks, or advance, considerably in their spring shoots, according to their nature of growth, &c.

With respect to the method of Parting

Roots, there is nothing more easy: when any plant you design to increase, has multiplied by its roots into a cluster of off-sets, the whole may either be taken up entirely, and the root parted into as many slips as are furnished with fibres, &c. or, on particular occasions, a quantity of slips may be detached from the sides all around as the parent plant stands in the ground: in either method, the work of Parting or slipping the Roots may in many sorts be effected easily with the hand; and in many others the assistance of a knife, &c. is often necessary in separating them properly; observing that when you want to make as great an increase as possible, you may part the root into as many slips as may be convenient, provided each is furnished with some fibre or root-part, and crowned with one or more buds or eyes for forming shoots at top; but in the flowery tribe, when the detached off-sets are wanted for flowering as strong as possible the ensuing season, they should not be parted very small, but into middling-sized slips, where practicable, which being planted in the proper places will flower in tolerable perfection the following season.

The slips should generally be planted directly by dibble; the very small slips plant in nursery-beds to stand till next autumn, to acquire strength; then may be transplanted with balls into the places where they are to remain; and the larger slips may be planted as soon as parted, at once where they are to continue.

This method of propagation may, if thought necessary, be practised to many sorts annually, as numbers of the herbaceous perennials multiply in one season into large bunches, as aforesaid, so as they may be increased at pleasure in great quantities.

PASSERINA, Sparrow-wort.

The plants of this genus are shrubby exotic ever-greens of Africa, &c. for the greenhouse collection, rising with woody, downy, white, durable stalks, from about half a yard to six or eight feet high; garnished with small fleshy leaves, and small monopetalous, tubular, four-parted flowers.

Class and order, *Ostendria Monogynia*.

Characters.] **CALYX**, none. **COROLLA** is monopetalous, with a slender tube, swelling below, and divided above into four spreading parts. **STAMINA**, eight bristly filaments placed in the tube, and nearly oval erect antheræ. **PISTILLUM**, an oval germen, slender style, and capitated hispid stigma. **PERICARPIUM** is oval, leathery, and unilocular, inclosing one oval, pointed seed.

1. *PASSERINA filiformis*.

Filiform-

Filiform-leaved Passerina.] Hath a shrubby stem, branching laterally five or six feet high, covered with a white mealy down; filiform, or very narrow convex leaves, closely imbricated four ways, and at the top of the shoots small white flowers.

This is the principal sort in the English gardens; it is a pretty ever-green, appearing beautiful at all seasons of the year.

2. *PASSERINA hirsuta.*

Hairy or shaggy Passerina.] Hath a shrubby, downy, shaggy stalk, branching diffusely six or seven feet high, covered with a soft mealy down; thick, short, fleshy, imbricated leaves, smooth without, and downy within, and small white flowers.

3. *PASSERINA ciliata.*

Ciliated leaved Passerina.] Hath a shrubby stalk, branching laterally five or six feet high; the branches naked below, but garnished at top with spear-shaped, erect, ciliated leaves, and small white flowers.

4. *PASSERINA uniflora.*

Uniflorous Passerina.] Hath a low shrubby stalk, branching out low into many smooth spreading branches, a foot and a half high; very narrow leaves placed opposite; and purple flowers singly at the termination of the branches.

5. *PASSERINA sericea.*

Silky Passerina.] A hairy stalk, ovate, tomentous, silky leaves, and quaternate flowers.

6. *PASSERINA capitata.*

Capituted-flowered Passerina.] With spear-shaped-linear, smooth leaves, and flowers produced in heads.

7. *PASSERINA laevigata.*

Polished smooth-leaved Passerina.] With ovate, acute, plane, smooth leaves; and obtuse flowers.

These exotics flower here in June and July: the flowers are small, and not very conspicuous, and are rarely succeeded by seeds in England.

The plants in this country must be always kept in pots of good earth, and placed in the green-house collection, in order for having shelter in winter, managing them like myrtles and other hardier green-house shrubs.

The propagation of all the sorts is performed by layers and cuttings in spring or summer, giving frequent waterings, and occasional shade every day to the cuttings till rooted; and by the end of September both layers and cuttings will be fit to pot off separately.

PASSIFLORA, Passion-flower.

This genus of plants consists of celebrated shrubby and herbaceous floriferous climbers

for the pleasure garden, green-house, and stove; rising mostly with long, slender, cirrhus-climbing stems, ascending by tendrils many feet high; ornamented some with palmated many-lobed leaves, others are bilobed, trilobed, multilobed, &c. and some with entire leaves; and at the axillas large pentapetalous, nectariferous, spreading flowers, of singularly curious structure and beauty.

Class and order, *Gynandria Pentandria.*

Characters.] *CALYX* is five-lobed, plane, and coloured. *COROLLA*, five large, half-spear-shaped, plane, obtuse petals, the size and figure of the calyx, and a nectarium within the petals, formed of many fibres or rays, in a sort of triple coronet round the gynandrious style, or central column; the exterior ones longest, and the upper ones drawing in narrow above. *STAMINA*, five awl-shaped gynandrous filaments, they being attached to a sort of pillar, crowned by the germen, and are placed at its base, spread out every way, and terminated by oblong incumbent antheræ. *PISTILLUM*, a roundish germen elevated upon an erect pillar or column, and the germen supporting three spreading styles, crowned each with a capitated stigma. *PERICARPIUM*, an oval, fleshy, baccaceous, unilocular fruit, placed on a pedicle; and many oval seeds.

There are thirty or more different species, but scarce one third of that number common to the English gardens; all of which are natives of foreign warm countries, in different parts of the world; and only one of them is hardy enough to succeed well here in the open ground; the others requiring shelter of a green-house and stove, but mostly of the latter.

Hardy Kind for the full Ground.

There is only one hardy species, a shrubby climbing exotic from the Brazils, which will prosper here in the full ground, planted against a warm south wall, where it will produce flowers and fruit annually; the flowers have singular beauty; but the fruit is only for variety as it grows, and for its seed for propagation.

1. *PASSIFLORA cœrulea.*

Blue-rayed Common Palmated Passion flower.]

Hath long, slender, shrubby, cirrhus-climbing, purplish-green stalks, branchy and ascending upon support by their claspsers thirty or forty-feet high; having at each joint one large palmated leaf, of five long folioles, expanding like an open hand, accompanied at the same joint by a long twining cirrhus, or clasper; and at the axillas large spreading flowers, with whitish-green petals, and a

blue radiated nectarium, succeeded by a large, oval, yellowish fruit.

It flowers from July until October; the flowers are very large, conspicuous, and their composition is exceedingly curious and beautiful.

The general structure of the singular flowers of this plant is, they come out at the axillas on pedunculi about three inches long, which they terminate; each flower having, close under the calyx, a three-lobed involucre-like appendage, a five-lobed calyx, and a five-petalous corolla, the size, figure, and colour of the calyx, &c. the petals arranging alternately with the calycinal lobes: the whole, including the involucre, calyx, and corolla, make just thirteen lobes and petals, all expanded flat; and within the corolla is the nectarium composed of a multitude of thread-like fibres, of a blue and purple colour, disposed in circular rays round the column of the fructification: the outer ray is the longest, flat and spreading on the petals; the inner is short, erect, and narrowing towards the centre; in the middle is an erect, cylindric, club-shaped column, or pillar, crowned with the roundish germen, having at its base five horizontal spreading filaments, crowned with incumbent yellow antheræ, that move about every way; and from the side of the germen arise three slender spreading styles, terminated by headed stigmas; the germen afterwards gradually becomes a large, oval, fleshy fruit, ripening to a yellowish colour.

These wonderful flowers are only of one day's duration, generally opening about eleven or twelve o'clock, and frequently in hot sunny weather burst open with elasticity, and continue fully expanded all that day, and the next they gradually close, assuming a decayed like appearance, and never open any more; the evening puts a period to their existence, but are succeeded by new ones daily on the same plant.

This plant and flowers are held in great veneration in some foreign catholic countries, where the religious make the leaves, tendrils, and different parts of the flower to represent the instruments of our blessed Saviour's passion; hence the name *Passiflora*.

Green-house Kinds.

There are two herbaceous species, exotics of Italy, Virginia and other parts of America, that will prosper here in the open air, sometimes the year round, in a warm situation; but are always subject to injury from severe frost; therefore it is proper to keep them principally in pots, in order to move to shelter of a green-house in winter.

Both the sorts have abiding roots; but the stalks generally decay here in winter, and are renewed again in spring.

2. *PASSIFLORA incarnata.*

Flesh-coloured Italian Passion-flower.] Hath a strong perennial root; slender, herbaceous, cirrrose-climbing stalks, rising upon support four or five feet high; leaves composed of three sawed lobes, each leaf attended by a twining tendril; and at the axillas long slender pedunculi, terminated each by one whitish flower, having a greenish calyx, and a reddish or purple radiated nectarium, surrounding the column of the fructification, and succeeded by a large, round, fleshy fruit, ripening to a beautiful orange colour.

The flowers of this species are also very beautiful, though of short duration, opening in the morning, and night puts a period to their beauty; but are succeeded by a daily supply of new ones.

The fruit of this sort is also very ornamental, as ripening to a fine reddish-orange colour; but these rarely attain perfection here, unless the plants are placed in the stove; therefore, when there is such accommodation, it highly merits that indulgence, where it will exhibit both flowers and green and ripe fruit, all at the same time, in a beautiful manner. Remarking, however, it will flower in the open air freely in summer, but not perfect its fruit, so as to appear so ornamental, as with the assistance of a stove.

3. *PASSIFLORA lutea.*

Yellow Virginian Passion-flower.] Hath a creeping perennial root; weak, slender, herbaceous, cirrrose-climbing stalks, rising upon support three or four feet high; heart-shaped, three-lobed, smooth leaves, having three equal, obtuse, entire lobes; each leaf attended by a twining clasper; and shortish pedunculi sustaining small yellowish flowers.

Some of both these species should always be retained in pots for removing them under shelter of a green-house or garden-frame in winter, to have protection from frost; and some may be planted in a dry warm situation against a south wall, where they will live through our moderate winters, but are liable to suffer in severe frosts, unless they are covered.

Stove Kinds.

The *Passifloras* of this temperature are exotics of South America and other hot parts of the world, and require the shelter of a stove here, and of which the following are the principal sorts in our gardens; some of them have undivided leaves, others are bilobate, and trilobate, &c.

4. *PASSIFLORA serratifolia*.

Sawed-leaved Surinam Passion-flower.] Hath slender, angular stalks, climbing by the tendrils several feet high; undivided, oblong-lanceolate leaves, serrated on the edges, accompanied by twining cirrhi; and axillary reddish-green flowers.

5. *PASSIFLORA laurifolia*.

Laurus-leaved Passion-flower.] Hath long, tough, rough, branchy, cirrhose-climbing stalks, rising by support twenty or thirty feet high; undivided, ovate, thick, entire leaves, on biglandulous foot-stalks; and axillary snowy-white flowers, striped or spotted with red, blue, and yellow, and with violet-coloured rays, a yellow column, purple styles, and indented involucre.

6. *PASSIFLORA vespertilio*.

Bat's-wing Passion-flower.] Hath slender, striated, branchy stalks; large, bilobate or two-lobed leaves, the base roundish and glandular, the lobes acute, widely divaricated like a bat's wings, and dotted underneath; and axillary flowers, having white petals and rays.

The leaves of this species have a singular appearance, the two lobes being expanded six or seven inches wide, resembling the wings of a bat upon flight; hence the name *Vespertilio*.

7. *PASSIFLORA rubra*.

Red Passion-flower.] Hath roundish or angular stalks; bilobate, heart-shaped acuminate leaves; and red flowers, succeeded by an hexagonal scarlet fruit.

8. *PASSIFLORA maliformis*.

Apple-fruited Passion-flower.] Hath long, thick, triangular, cirrhose-climbing stems, rising by support fifteen or twenty feet high; undivided, large, oblong-heart-shaped, entire leaves, on biglandular or two-eared foot-stalks; and long axillary peduncles, sustaining large, white-petaled flowers, having reddish entire involucre, and purplish rays, succeeded by large maliform, or apple-shaped yellow fruit.

9. *PASSIFLORA holosericea*.

Velvety, or Silky-leaved Passion-flower.] Hath long, slender, downy stalks, climbing by support twenty feet high; three-lobed halberd-shaped, downy, soft, silky leaves, having each side of the base indented and reflexed; and axillary white flowers, with purple and yellow rays.

10. *PASSIFLORA multiflora*.

Multiflorous Passion-flower.] Hath long, slender, cirrhose-climbing stalks, rising by support twenty feet high; undivided, oblong, entire leaves; and many flowers growing

in clusters, having white petals and purple rays; succeeded by smallish, egg-shaped, yellow fruit.

11. *PASSIFLORA quadrangularis*.

Quadrangular-stalked Passion-flower. Hath long, four-cornered, membranous stalks, climbing many feet high; undivided, almost heart-shaped, entire leaves, on foot-stalks having six glands; and large white and purple flowers.

12. *PASSIFLORA suberosa*.

Cork-barked Passion-flower.] Hath slender stalks, climbing fifteen or twenty feet high, having a whitish, fungous, cracked bark, like the cork-tree; three-lobed, target-shaped leaves; and small whitish-green flowers.

13. *PASSIFLORA alata*.

Winged-stalked Passion-flower.] Hath long quadrangular membranaceous stalks, climbing many feet high, undivided heart-shaped leaves on foot-stalk, having four glands, and at the axillas large flowers, with scarlet petals, and erect nectarium chequered with purple.

14. *PASSIFLORA Murucuja*.

(Murucuja) or Moon-shaped-leaved Passiflora.] Leaves two-lobed, obtuse; the base undivided; and monophyllous nectariums.

15. *PASSIFLORA digitata*.

Digitated-hand-shaped Passiflora.] With palmated, serrated leaves.

16. *PASSIFLORA rotundifolia*.

Round-leaved Passion-flower.] With leaves almost three-lobed, obtuse, roundish.

17. *PASSIFLORA minima*.

Leafy, or small-flowered Passiflora.] Leaves three-lobed, with the lobes lanceolate entire, and the intermediate lobe produced.

All these species of *Passiflora* flower here in summer, beginning commonly in July, and continue in succession for two or three months; for although the flowers of all the sorts are scarcely of more than one day's duration, they are succeeded by new ones daily; for as the shoots advance, fresh flowers arise at the joints; in all the sorts they consist each of a five-lobed calyx, and a corolla of five petals, and circular rays in the centre, surrounding the column of the fructification (see the *Characters*); and many of the sorts are succeeded by fruit in our gardens, which in all the sorts is of an oval form, some of the size of large plums and middling apples, and some not larger than gooseberries.

All the above seventeen species here enumerated are of the cirrhose-climbing kind, i. e. climbing by means of their twining cirrhi, or claspers, that catch hold of any adjacent support. See CLIMBING PLANTS.

As all the species are natives of warm countries, in these parts they are mostly of a tender quality, except the first sort, which succeeds very well in the full ground, in a warm situation; only their young branches are sometimes killed in very severe winters; but plenty of new ones generally rise again in spring following: the second and third sorts, however, are tender, and must, for the most part, have shelter in winter: all the others, denominated stove kinds, must always be retained in that repository.

The first species, *Passiflora cærulea*, being the hardiest, is considerably the most common sort in our gardens; is superior both as a climber, and in the beauty of its flowers: as a climber it demands our particular notice, for it may be trained to the top of the highest walls, even if thirty or forty feet high, and will often shoot fifteen or twenty feet in one season, producing from the joints, as they advance, a plentiful succession of their extraordinary flowers for three months; therefore this fine climber highly merits a place in every garden, and may be easily raised from seed, layers, and cuttings (see its *Propagation*), or may be purchased reasonable at all the nurseries. The season for transplanting it is early in autumn, or in February or March.

It should generally be planted against some high warm south wall, in order for training its branches; for they must be supported, otherwise they will trail on the ground, or entangle with one another, so that its stems and branches must be constantly nailed up to the wall five or six inches asunder; and according as they shoot during summer, train in most of the shoots for flowering, and principally at full length for the present, or according as it may be convenient to extend them more or less, suffering them to remain so all the winter; and in spring the whole may be pruned, cutting out all dead shoots that have been killed by the frost; and where the branches or shoots are too much crowded, thin out all the weakest and worst placed; leaving a due supply of the strongest shoots at proper distances in every part from bottom to top; and let each of those be shortened to about a yard, or four or five feet long, according to their strength, both to confine them within proper compass, if necessary, and promote their throwing out strong shoots for the ensuing summer's bloom; for the flowers are produced always upon the shoots of the year.

As in severe winters their branches, if not protected, are sometimes killed, it is advisable at such times, whilst the plants are young in particular, to grant them shelter of mats du-

ring the inclement season, and protect their roots with dry litter laid over the ground: observing, however, to uncover their branches as soon as the frost breaks: this covering, however, is only necessary in very severe frosts.

The two green-house sorts should generally be potted, to move to shelter in winter, either of a green-house or deep garden-frame: some plants of each sort may also be planted in the full ground, in a warm border, to take their chance; observing to cover the ground over their roots in severe weather; and in the different orders of planting, place stakes for the support of their climbing growth, and on which to train their stems and branches in summer.

All the stove kinds must constantly be kept in pots, placed always in the stove, and for the most part plunged in the bark-bed; placing strong stakes for the purpose of training the branches; managing them as other stove-plants of a similar nature. See STOVE-PLANTS.

Propagation of all the Sorts.

The propagation of all these species of *Passiflora* is by seed, by layers, and by cuttings; under the following heads, hardy kind, green-house kinds, and stove kinds.

Hardy Kind.—This sort, common Passion-flower, is raised in the three following ways. First by Seed. In March sow the seed in large pots, half an inch deep, and either plunge them in a warm border, and as the weather becomes warm move them to the shade; or if, as soon as the seed is sown, the pots are plunged in a hot-bed, it will forward the germination of the seed, and the plants will rise sooner; which harden gradually to the open air till October; then place them under a garden-frame for the winter, to have shelter from frosts, and in spring plant them in pots, or some in the nursery, and in a year or two they may be transplanted where they are to remain, against some warm south wall. 2. By Layers. In spring lay down some of the branches in the common way; they will readily emit roots, and make proper plants by autumn; when, or rather in spring following, transplant them either in pots, nursery rows, or where they are to remain. 3. By Cuttings. In February or March cut off a quantity of strong young shoots, in length from about eight to ten or twelve inches, plant them in any bed or border of common earth, giving frequent watering in dry weather, and when sunny and hot, if in a situation exposed to the sun, a moderate shade of mats will be of much advantage; and they will emit roots at bottom, and shoots at top, and become good plants by autumn, allowing them occasional shelter of mats, &c. during

during the winter's frost; and in spring plant them out.

If a quantity of these cuttings are planted close, and covered down with hand-glasses, it will forward their rooting; observing, however, when they begin to shoot at top, to remove the glasses.

Green-house Kinds.—Both the sorts, by seed, layers, and parting the roots. 1. By Seed. This is commonly obtained from America; sow it in pots in March or April, and plunge them in a hot-bed to raise the plants, which inure to the open air in summer, and give them shelter of a green-house or frame in winter, and in spring plant some out in pots, and place them among the green-house plants; and others may be planted in the full ground, under a warm fence, to take their chance. 2. By Layers. In summer lay some young shoots, they will readily grow, and become good plants for potting off in autumn. 3. By parting the Roots. In spring, before they begin to shoot, is the proper time; the second sort in particular multiplies exceedingly by its creeping roots; which divide into slips, and plant them in a bed of rich earth till autumn, when some should be transplanted into pots for occasional shelter in winter.

Stove Kinds.—All these sorts by seed, layers, and cuttings.

By Seed. This is procured chiefly from abroad; sow it in spring in pots, plunge them in a hot-bed, or in a stove bark-bed; the plants will soon appear, which, when three inches high, prick out in separate small pots, give water, and plunge them again in the hot-bed, giving occasional shade till rooted; as they advance in growth, shift them into larger pots, and retain them constantly in the stove.

By Layers.—In spring, or beginning of summer, lay the young branches; they will readily grow, and be fit to pot off separately in autumn.

By Cuttings.—In spring or summer, plant some cuttings of the young shoots in pots, plunge them in the bark-bed, give water frequently; most of them will take root, and be fit to pot off singly in autumn.

PASTINACA, Parsnep.

The principal of this genus is that well-known herbaceous esculent, *Garden Parsnep*, a biennial of high estimation for its large eatable root, valuable for winter and spring service, crowned with large pinnated leaves, and when it shoots for seed, runs up with a large branchy stem terminated by umbelliferous flowers.

Class and order, Pentandria Digynia.

Characters.] CALYX, a multiple umbel-

lated flower, destitute of an involucre, and with scarcely visible cups to the florets. COROLLA, a uniform umbel of many small florets, composed each of five spear-shaped involute petals. STAMINA, five hair-like filaments, and roundish antheræ. PISTILLUM, a small germen under each floret, two reflexed styles, and obtuse stigmas. PERICARPIUM, none; a plane, compressed, elliptical, two-parted fruit, having two elliptic seeds, surrounded with a border.

There are only two species of this genus, the principal of which for our purpose is the common parsnep, viz.

1. *PASTINACA sativa.*

Cultivated, or Garden Parsnep.] Hath a large, long, fleshy root, penetrating perpendicularly into the ground, half a yard or two feet in length, three or four inches or more thick at top, tapering gradually to the lower end; crowned with very large singly-pinnated leaves; and when it shoots for seed, rises with an upright, strong, channeled, hairy stalk, branching four or five feet high, having all the branches terminated by large yellow umbels of flowers.

2. *PASTINACA opoponax.*

Opoponax, or Italian Gum Parsnep.] With large, decomposed, pinnated leaves, and very tall flower-stems.

Of these two species, the first is the principal sort for kitchen garden culture; the second is only sometimes introduced in large collections for variety and medicine; but as to the first species, garden Parsnep, it is a profitable and nourishing root for the service of a family in autumn, winter, and spring, being excellent to boil for sauce to salt-beef, pork, bacon, and salt-fish, and is a biennial plant, raised from seed in spring, shoots up only leaves the first summer, and the roots attain full perfection for use the same year in autumn and winter; and in the spring after, shoot up into stalk for flower and seed, and having ripened seed, totally perish; so that a fresh supply must be raised annually.

The Garden Parsnep is an exceeding fine esculent root, though, by reason of its peculiar sweet relish, it is not in general estimation; it, however, is a very wholesome and nourishing root, to many very palatable, and is very profitable for family service, and goes off well in the markets.

The principal season of parsneps is from October or November until the spring; for they are seldom good till they have attained their full growth, determinable by their leaves beginning to turn yellow and decay in autumn; and they will continue in great perfection

fection until March or April; then they begin to shoot up into stalk for seed, when they become hard, sticky, and unfit for eating.

Its Propagation and Culture.

The propagation of this esculent root is by seed annually in the open quarters of the kitchen garden. February and March is the proper season for sowing; observing to procure fresh seed; for if more than one year old, it will not grow.

I should advise the main crop of Parsneps to be sown alone, and not mixed with other crops, such as onions, leeks, or carrots, as often practised; for there is nothing gained by this; it rather causes confusion, and more trouble in the culture; but by sowing them separate, their culture can be better attended to, and the crop will attain greater perfection.

Chuse for this crop a spot of the best light, rich, deep soil, in one of the most open airy quarters, which should be trenched one full spade deep at least, or if two the better, provided the depth of good staple admit, that the roots may have a due depth of loose soil to run down straight to their full length: observing, that if the ground is previously trenched up in rough ridges in winter, especially if any ways stiff or wet, and thus lie exposed some time to the sun and air, it will improve its temperament greatly for this purpose; then at sowing time level it down, in dry weather, for the reception of the seed, breaking all large clods, and leave an even surface, but not rake it till after the seed is sown, which should generally be performed whilst the ground is fresh stirred, or at least before the surface becomes too dry, so as, in raking, the clods will readily fall under the rake to bury the seed regularly.

Sow the seed by broad-cast thinly, either all over the surface, or the ground may be divided into four-feet-wide beds, as shall be convenient, though for large quantities the former is the most eligible practice; as soon as the sowing is done, if light ground, tread down the seeds evenly, and finish with an even good raking, to cover all the seeds equally, and smooth the surface: in about three weeks the seeds will germinate, and the plants will soon appear above ground; when, having advanced a little in growth, they should be thinned and weeded, as directed below.

When the plants are two or three inches high, proceed to thin them to regular distances, and clean them from weeds; which works may be done either by hand or small-hoeing; but the latter is preferable for the benefit of the crop, and considerably the most expeditious method: it should generally be

performed by a three or four-inch hoe. Chuse dry weather, and cut out the plants to about ten or twelve inches distance, for they should have large room, cutting up all weeds as you proceed; after this, no more culture will be required till the future progress of the weeds renders another hoeing necessary; and probably another repetition may also be required, till the plants are in full leaf, when they will cover the ground, and bid defiance to any farther interruption from weeds, and will not require any farther attention till autumn, when the roots will become fit for use.

In October the roots will be arrived nearly at full growth; when the leaves begin to turn yellow and decay, is a certain sign of maturity, and may then begin to dig up some of them for use, according as they are wanted.

These roots may either remain in the ground all winter, and be taken up according as they are wanted; or a principal quantity may be dug up in November, and their tops pared off close, then buried all winter in sand, in some shed or other dry place, to be ready at all times for use, as directed for carrots; which may be practicable enough for moderate supplies; but may also leave some in the ground for spring service, till January or the beginning of February, just before they begin to shoot, then dig them up and lay them in sand; and by taking them up at this time, it will retard their effort for shooting, so as they will continue in tolerable perfection until the latter end of April.

Saving Seeds of this Plant.

To have parsneps always in due perfection, great care is necessary to save seed only from some of the finest roots.

Therefore in autumn or November select a quantity of the large, long, straight roots, trim off their leaves, and plant them in rows three feet asunder, two distant in the lines, and about an inch deep over their top; thus they will shoot up strong in spring for flowering, and will ripen seed in the latter end of August, or early in September; when, in dry days, cut off the umbels of seed, and spread them upon mats to dry and harden, then thrash out the seeds, and put them up in bags for sowing next spring.

PEDICELLUS, Pedicle, a partial flower-stalk, or proper stalk of any single flower of an aggregate or cluster of flowers; the main flower-stalk, which proceeds immediately from the plant, and supports one, two, or many flowers, is termed the *Pedunculus*, or common foot-stalk of the flowers; and all the lesser stalks detached from the sides or any part of this, are botanically styled *Pedicellus*. See **PEDUNCULUS**.

PEDUNCULUS, Peduncle, the main foot-stalk of a flower, or head of flowers, bearing the fructification only, and not the leaves.

The Peduncle is often divided or branched into others, and each of the divisions is termed a *Pedicellus*, or little flower-stalk; so that the principal foot-stalk of any head or cluster of flowers is styled the common flower-stalk or *Peduncle*; each of the lesser foot-stalks issuing from it is the partial stalk, or pedicle, of any single flower in the aggregate, head, or cluster of flowers, supported by the main foot-stalk, or Peduncle; thus the *Pedicellus* is always distinguishable from the main flower-stalk or *Pedunculus*. See **PEDICELLUS**.

The Pedunculi, or main flower-stalks, are also distinguished by different epithets, according to the place of the plant from which they proceed, as the root, stem, branch, axillas, termination, &c. viz.

Pedunculus radicalis, radical, or root flower-stalk, rising immediately from the root.

Pedunculus caulinus, cauline, or stem flower-stalk; when it proceeds from the stem.

Pedunculus rameus, ramous, or branch flower-stalk; when it proceeds from the branches.

Pedunculus axillaris, axillary, or arm-pit flower-stalk; when it proceeds from the axilla, i. e. comes out at the angles between the leaf and stem, or branch, or between the branch and stem. See **AXILLA**.

Pedunculus terminalis, terminal flower-stalk; when it proceeds from the termination or end of the stem or branch.

Pedunculus solitarius, solitary Peduncle; when it grows singly, or only one in the same place. Remarking that a solitary Peduncle may support many flowers; but a solitary flower implies also a single or solitary flower-stalk.

Pedunculi sparsi, sparsed, or scattered flower-stalks; when they grow many together, scattered without any order.

Lastly, the Peduncle bears other different epithets, both from the number of flowers on each, and from the different modes in which the flowers are borne and connected on the Peduncle, &c.

To express the number of flowers on each Peduncle, they are called *uniflorous*, when they bear but one flower; *biflorous*, when two flowers; *triflorous*, when three flowers; and *multiflorous*, when many flowers.

And to express the different principal modes of bearing the flowers, they are termed either *capitulum*, i. e. little head, or compact round cluster; *spica*, the spike; *corymbus*, a corymbus; *umbella*, an umbel; *panicula*, the panicle; *thyrsus*, the thyrsus; *racemus*, a cluster; *verticillus*, the verticil, or whorled-spike. See each under its respective head.

To the above modes of flowering may also

be added, *aggregatus*, the aggregate; *amentaceus*, the amentum; and *spadiceus*, the spadix. See **AGGREGATUS**, **AMENTACEUS**, and **SPADICEUS**.

PELARGONIUM, African Geranium.

This genus (formerly *Geranium*) furnishes for the green-house many species of fine shrubby and under-shrubby evergreens, and some herbaceous perennials, mostly admired for their fragrance and ornamental flowering in long succession in summer and autumn; were all heretofore conjoined with the common geraniums; but as the species of both have of late years become very numerous, and as most of this African family, now under the present genus *Pelargonium*, are of the shrubby tribe, with the calyx or flower-cup, corolla, and number of prolific stamina, differing somewhat materially from the other geraniums, modern botanists thought it expedient to separate and arrange them under distinct genera; of which this is the most considerable both in the number of species and respective merit, as principal ornamental garden plants of the tender exotic tribe, rising mostly with low dividing stems of a very branchy free growth, two or three to five or six feet high, adorned with roundish, oval, spear and heart-shaped leaves, and many pentapetalous irregular flowers, in umbellate bunches at the sides and termination of the branches in summer and autumn, conspicuous and beautiful; succeeded by ripe seed.

Class and order *Monadelphia Heptandria*.

Characters.] **CALYX**, monophyllous at the base, and divided in five parts above. **COROLLA**, five irregular oval or heart-shaped petals. **STAMINA**, seven fertile, or in the whole, ten unequal filaments, three of which are castrated, the other seven topped with oblong versatile antheræ. **PISTILLUM**, a five-cornered rostrated germen, style awl-shaped, longer than the stamina, permanent, and crowned with five reflexed stigmata. **PERICARPIUM**, a long rostrated spiral, bearded capsule of five cells, containing oval-oblong seeds.

The principal species are, viz.

Shrubby with woody stalks.

1. **PELARGONIUM betulinum**.

Birch-leaved Geranium.] Geranium with a woody stalk branching four or five feet high; oblong-oval, plane, unequally sawed leaves, and large reddish umbelliferous flowers from the sides of the branches.

2. **PELARGONIUM acetosum**.

Sorrel-tasted Geranium.] Geranium with a woody stalk branching five or six feet high; oval, fleshy, smooth leaves, and bluish-coloured red-striped flowers, by threes and fours in an umbel.

Vari.

Variety.] With scarlet flowers.

3. PELARGONIUM *lanceolatum*.

Spear-shaped Geranium.] Geranium with an erect stalk branching two or three feet high; glaucous, spear-shaped, entire leaves, and single white flowers, the two upper petals spotted with red, on long foot-stalks from the sides of the branches.

Shrubby, with the stalk fleshy.

4. PELARGONIUM *carnosum*.

Fleshy-stalked Geranium.] Geranium with a very thick, fleshy, jointed stalk, branching two or three feet high; pinnatifid, laciniated, thinly-placed leaves, and whitish flowers at the top of the branches.

5. PELARGONIUM *gibbosum*.

Gibbous or gouty-stalked-Geranium, with columbine leaves.] Geranium with a fleshy stalk, gibbous or swelling at the joints, branching three or four feet high; doubly pinnatifid, fleshy, smooth, opposite leaves, and dark-purple flowers at the upper part of the branches.

6. PELARGONIUM *vitifolium*.

Vine-leaved, balm-scented Geranium.] Geranium with an erect stalk, branching five or six feet high, ascending, heart-shaped, lobate, downy leaves, and pale-blue flowers, in close bunches, on long foot-stalks, from the axillas of the branches.

7. PELARGONIUM *fulgidum*.

Fulgid or Flaming-red Geranium.] Geranium with a fleshy stalk, branching a foot or two high, garnished with divided, three-parted, smooth, light-green leaves, pinnatifid at their edges, having the middle lacinia largest, and flame-coloured scarlet flowers in twin umbels, from the sides of the branches.

8. PELARGONIUM *zonale*.

Zone-marked or horse-shoe Geranium.] Geranium with a shrubby stem, branching four or five feet high, garnished with roundish, heart-shaped, indented leaves, marked with a purple zonal circle, going quite round, in form of a horse-shoe; and from the upper parts of the branches, close umbels of reddish-purple flowers, on very long foot-stalks.

Varieties.] Common green leaved—variegated leaved, very beautiful—silver-striped—gold-striped—silver-edged—red-flowered—purple-flowered—scarlet-flowered.

9. PELARGONIUM *capitatum*.

Capitated rose-scented Geranium.] Geranium with a fleshy diffused stalk, branching irregularly four or five feet high, unequally trilobed, waved, hairy leaves, and purplish-blue flowers, in a capitated corymbus at the ends of the branches.

10. PELARGONIUM *inquinans*.

Scarlet Geranium.] Geranium with a shrubby stem, branching uprightly six or eight feet

high, garnished with orbicular, kidney-shaped, thick, bright-green leaves, hairy underneath; and many bright-scarlet flowers growing in an umbel.

11. PELARGONIUM *papilionaceum*.

Butterfly Geranium.] Geranium with a shrubby stalk branching five or six feet high, with roundish, angulated, heart-shaped leaves, upon long foot-stalks; and papilionaceous-shaped, finely variegated flowers in loose umbels at the ends of the branches.

12. PELARGONIUM *cuculatum*.

Hood-leaved Geranium.] Geranium with a shrubby stalk, branching seven or eight feet high, reniform, indented, nervous leaves, hollow in the middle, like a hood, and purplish-blue flowers in large loose umbels at the top of the branches.

Variety.] With angular-hooded leaves.

13. PELARGONIUM *glutinosum*.

Clammy Geranium.] Geranium with a shrubby stalk, branching four or five feet high, halberd-shaped, cordate, angular, clammy leaves, darkly stained in the middle with purple; the flowers are of a reddish purple, with a white streak in the middle of the two upper petals; they grow in a small umbel, near the tops of the branches.

14. PELARGONIUM *tetragonum*.

Square-stalked Geranium.] Geranium with a fleshy quadrangular stalk, branching two or three feet high; the leaves are few in number, coming out singly from each joint, variegated with a yellowish red round the border; the flowers come out in pairs from the joints of the branches, and consist of four unequal petals; the two upper ones are large, flesh-coloured, and streaked with red, rising upwards, and the lower ones small and declining.

15. PELARGONIUM *radula*.

Rasp-leaved Geranium.] Geranium with a tree-like, fleshy stem, branching eight or nine feet high, linear, multifid, rough leaves, with revolute borders, flesh-coloured flowers marked with red spots, and striped on the upper petals, three or four growing together on the tops of the branches.

16. PELARGONIUM *bicolor*.

Two-coloured Geranium.] Geranium with fleshy stalks, branching four or six feet high; ternate, dentated, waved leaves, downy underneath; and flowers of a dark purple, edged with white, growing in an umbel on long foot-stalks from the tops of the branches.

17. PELARGONIUM *tricolor*.

Three-coloured Geranium.] Geranium with a short fleshy stalk, dividing into several branches rising about a foot high, garnished with trilobate, dentated, hairy leaves, on long foot-stalks:

stalks, the flowers come out from the ends of the branches, and are each composed of five ovate petals; the two superior ones are of a most beautiful red, having their bases nearly black, the three lower ones are white, hence the name of tricolor.

This plant produces its beautiful flowers in constant succession the greatest part of the summer in great profusion.

All these shrubby Pelargoniums are beautiful evergreens, being furnished with leaves all the year, and most of them floriferous in summer; several sorts continue a succession of flowers most of the summer months even until winter; the shoots of most of them are somewhat succulent, and of an herbaceous nature the first year of their growth, but become more woody as they advance in age; their leaves are mostly of an orbicular roundish figure, though some sorts are divided into lobes, and are from about two to four inches broad, and mostly footstalked, the flowers are quinquepetalous; and separately, are rather small, but being generally produced in clusters, are very conspicuous and ornamental.

They being all natives of Africa, are of a tender quality, and in their culture here must always be retained in pots, for moving to the shelter of a greenhouse, &c. in winter; where they should have as much free air as possible in open weather, and stationed towards the front next the windows.

Propagation.

By seeds, and cuttings of the branches; though as they all grow very freely by cuttings, they are most commonly propagated by that method, either in the natural ground, or by aid of a hot-bed, to bring them forward.

By Seed.—In April the seed may be sown either on a bed of light rich earth a quarter of an inch deep, or in pots or boxes in the same soil, and the plants will come up in six weeks: but to forward their growth as much as possible, to be strong before winter, it is more advisable to sow in a hot-bed; that is, in March or April, sow in pots, plunge them, and cover with glasses; when the plants are two inches high, prick them into separate pots, which if plunged also into a hot-bed, will greatly forward these seedlings, giving them occasional watering and shade till rooted, and afterward harden them by degrees to the full air.

By Cuttings.—These may be planted in the full ground in May, June or July; or, to have them more forward, some may be planted in pots in March or April, and plunged in a hot-bed: in either case take off the cuttings, for planting, with a knife from about four or five to eight or ten inches long, trimming off the leaves from

the lower parts of each cutting; observing, if the top is very soft and herbaceous, it may be shortened down to the firmer part; but when robust and woody, leave it entire. They may be planted either in the full ground in a shady border, if in summer, or in pots placed in the shade, or in pots plunged in a hot-bed as before observed. In either mode of planting, put the cuttings two parts out of three into the ground, give a little water directly, and repeat it occasionally; and the cuttings will soon emit roots at bottom and shoots at top, and be fit to transplant into separate pots in two or three months.

With respect to their general culture and management, observe as follows. They prosper in any light rich earth, but grow the most luxuriant in a moderate loamy soil, though in a light mould, as they shoot more moderate, they are more profuse in flowers.

These plants, as before noticed, must be always retained in pots for moving to shelter in winter, and into the open air in summer: therefore, about the middle or latter end of May, place them in the open air till October, observing to give them frequent waterings in dry weather; which, in a very hot dry time, will be requisite almost every day. Towards the end of October remove them into the greenhouse, there to remain until May, placing them rather toward the front next the windows, in order to have as much free air as possible; otherwise they will be apt to draw up weak, and sometimes the young shoots will mould and rot off, especially if they are much crowded; during their residence here give moderate watering once a week, or ten or twelve days, as may appear necessary, and as the spring and warm weather advances give more in proportion, but let it be always in moderation while they remain in the greenhouse, especially the fleshy, or more succulent kinds, which are apt to take a mouldiness and rot with redundant moisture or very damp air; with respect to fresh air, they of course will have it in common with the other exotics of the same department (see *green-house plants*;) also observe to keep all decayed leaves constantly picked off.

These plants being very fast growers, should be shifted every year at least into larger pots; the proper season for which is in April or May, being careful to remove them with the balls of earth about their roots, paring off the outside matted fibres, and clear off some of the old earth all around, and so pot them again directly into fresh mould, filling up around the ball, and about an inch in depth over its top with the same new soil.

*Herbaceous Kinds.*18. PELARGONIUM *alchimilloides*.

Ladies' mantle-leaved Geranium.] Geranium with herbaceous trailing stalks, a foot and a half long, roundish, palmated, hairy leaves, the edges cut into many parts, and whitish flowers growing three or four on each foot-stalk.

Varieties.] With a dark circle in the middle of the leaves—and with bluish flowers.

19. PELARGONIUM *odoratissimum*.

Sweet-scented Geranium.] Geranium with an herbaceous, short, fleshy stalk, dividing into several short branchy heads, garnished with heart-shaped, soft, downy leaves, strongly scented, and many small white flowers by fours and fives, appearing most part of the summer.

20. PELARGONIUM *grossularoides*.

Gosseberry-leaved Geranium.] Geranium with herbaceous, prostrate, very smooth stalks, branching a foot and a half long, small roundish, heart-shaped, crenated leaves, and reddish flowers on short footstalks from the sides of the branches.

21. PELARGONIUM *triste*.

Night-smelling Geranium.] Geranium with a thick tuberous root, crowned with villous, lacinated, prostrate leaves, and among them arise bifid, naked flower-stalks, terminated by bunches of yellowish, dark-spotted flowers, smelling sweet in the evening.

22. PELARGONIUM *lobatum*.

Vine-leaved Geranium.] Geranium with a large, roundish, fleshy root, crowned with lobate, hairy, crenated leaves, and between them naked flower-stalks a foot high, terminated by umbellate clusters of red, and, in some sorts, white flowers.

Varieties.] With pinnatifid leaves—with lacinated leaves.

23. PELARGONIUM *rapaceum*.

Caraway-leaved, or variable Geranium.] With a fibrous root, crowned with compound, lacinated, villous leaves, and between them flower-stalks, terminated by compound umbels of flowers, which in the different sorts are red, crimson, purple, white, &c.

Varieties of this are,

Auriculated, variable Geranium—long-leaved Geranium—fleshy-leaved Geranium.

24. PELARGONIUM *pinnatum*.

Pinnated Geranium.] Geranium with a fibrous root, crowned with pinnated leaves, with oval, roundish lobes, hairy on their under-side, the flower-stalks terminated by umbels of flowers of different colours.

All these tender herbaceous Pelargoniums being natives of Africa, as observed of the shrubby kinds, must always be kept in pots

to move to shelter in winter: they grow freely in any light rich garden earth, and may be kept either in a green-house, or garden frame, and sheltered with glass lights: the tuberous rooted kinds are remarkably fine scented in the night, hence are denominated *Geranium noctivolens*, or night-smelling Geranium. They may be propagated by seed sown in the spring in pots of light earth, and placed in a hot-bed, as directed for the shrubby sorts; they may also be increased by parting their roots in August or September.

PENDULUS *Flos*, a Pendulous flower; such as hangs downward in a loose dangling manner.

PENSTEMON, Bastard Asarum.

Consists of two hardy, herbaceous, flowering plants of a moderate growth, garnished with lanceolate leaves and spikes of ringent, purple flowers of ornamental appearance.

Class and order, *Didynamia angiospermia*.

Characters.] CALYX, a five-parted monophyllous cup. COROLLA, monopetalous, bilabiated, and ventricose. STAMINA, four, slender filaments spreading at top, two of which are shorter, with bifid antheræ. PISTILLUM, an oval germen, slender style, deflected at top, crowned with a truncated stigma. PERICARPIUM, an oval, pointed, compressed capsule with two cells, containing many subglobose seeds.

We know but of two species.

1. PENSTEMON *pubescens*.

Hairy Penstemon.] Rises with herbaceous, upright, branching, hairy stalks, a foot and a half high, adorned with spear-shaped, pointed leaves placed opposite; their base embracing the stalks; and short loose spikes of purple flowers from the forks of the branches.

Varieties.] With broad leaves—with narrow leaves.

2. PENSTEMON *laevigata*.

Smooth Penstemon.] Rises with smooth branching stalks, garnished at bottom with petiolated, oval, acuminate, entire leaves, the upper ones spear-shaped, dentated, embracing the stalks; and spikes of violet-coloured flowers, with spreading corollæ.

The flowers of these species and varieties are of the ringent or gaping kind, many upon each spike, and appear from September to November: as these plants seldom continue longer than two years, some should be raised annually.

Their propagation is by seeds sown in autumn, when ripe: the plants readily rise the ensuing spring, and may be planted out in May or June into the borders of the pleasure-ground, &c.

PEN-

PENTANDRIA, the name of the fifth class, which consists of plants with hermaphrodite flowers, having five stamina, and comprises six orders, derived from the number of styles. See **CLASSIS**.

PENTAPETALI, Pentapetalous, or of five petals; flowers that have five petals. See **COROLLA**.

PENTAPETES, Indian Vervain Mallow.

This genus furnishes, for our observation, two tender Indian exotics for the stove, consisting of a beautiful floriferous annual of upright, tall growth, and a shrubby ornamental-flowering evergreen; garnished in the different species, with hastate-lanceolate, and ovate leaves, and pentapetalous scarlet and white flowers.

Class and order, *Monadelphia Dodecandria*.

Characters.] **CALYX**, double; the inner three-leaved, and the outer monophyllous, five-parted, lanceolate, and pointed. **COROLLA**, five roundish spreading petals. **STAMINA**, twelve or more tender filaments, five of which are castrated; they are united below and topped with erect arrow-shaped antheræ. **PISTILLUM**, an oval germen, slender style, and stigma slightly indented. **PERICARPIUM**, a membranaceous, subglobose, pointed capsule of five cells, each containing an oval pointed seed.

The species are,

1. **PENTAPETES phænicea**.

Scarlet flowered Pentapetes.] Rises with an upright stem three or four feet high, garnished with hastate, spear-shaped leaves, serrated on their edges, on long footstalks, and placed alternate: the flowers come out on short slender footstalks from the axillæ of the leaves, and are of a rich scarlet colour: they are succeeded by membranaceous capsules containing the seeds.

These plants being natives of India, will not succeed in this climate without the aid of the stove; of which the first species is the most noted, for its most beautiful scarlet flowers, in long succession in summer and autumn.

The propagation is by seeds sown on a hot-bed in the spring, and when up two or three inches high, must be transplanted in single pots, and forwarded by the heat of the hot-bed, and afterward shifted into larger-sized pots and placed in the stove, where they will exhibit their flowers from June till autumn, the same year in the first sort; the other, when of some advanced growth.

2. **PENTAPETES suberifolia**.

Cork-tree-leaved shrubby Indian Pentapetes.] Rises with a shrubby stem, garnished with ovate repand-angulate leaves, and white flowers.

PERENNIS *Planta*, a Perennial, or everlasting plant; a plant that is perpetuated by the roots; that is, whether the leaves and stalks decay annually in winter, or always remain, provided the roots are of several years' duration, it is still a Perennial plant.

All plants, therefore, with abiding roots, both of the herbaceous tribe in general, and of the shrub and tree kinds, are Perennials; though, in the general acceptance of the word Perennial, it is most commonly applied to herbaceous vegetables with durable roots, more especially those of the flowery kind, which among gardeners are commonly called simply Perennials, particularly the fibrous-rooted tribe; but it is equally applicable to fibrous, tuberous, and bulbous-rooted plants, whose roots are of several years' duration: likewise all shrubs and trees of every denomination, as having abiding roots, are Perennial plants.

Perennial plants consist both of deciduous and ever-green kinds; those that cast their leaves, &c. in winter are termed deciduous Perennials, and those which retain their leaves, ever-greens.

Of the herbaceous Perennials, however, both of the fibrous-rooted tribe, tuberous and bulbous-rooted kinds, far the greater part have annual stalks, rising in spring and decaying in winter; and a great many lose their leaves entirely also in that season, such as the Perennial sun-flower, asters, and numerous other sorts; and many sorts retain their leaves all the year, but not their stalks; exemplified in the auricula, polyanthus, some *campanulas*, pinks, carnations, and many others.

Great numbers of the herbaceous Perennials multiply exceedingly by off-sets of the root, by which they are propagated in great abundance. See **OFF-SETS**, &c.

All the tree and shrub Perennials are durable both in root, stem, and branch; but all renew their leaves annually, even the ever-green kinds, although they are in leaf the year round, yet they put forth new leaves every year, to which the old ones gradually give place.—See **DECIDUOUS** and **EVER-GREEN TREES**, &c. For a list of herbaceous Perennials, see **BULBUS** and **RADIX PERENNIS**.

PERIANTHIUM, flower-cup, or the most common species of calyx, placed immediately under the corolla, containing it as in a cup. See **CALYX**.

Many flowers, however, are destitute of a *Perianthium*, or flower-cup, such as most of the liliaceous plants, as the lily, tulip, crown-imperial, &c.

But far the greater number of plants are furnished

furnished with a proper flower-cup, and is of different structures in different genera: for some explanation, see CALYX.

PERICARPIUM, the seed-vessel of plants, analogous to the fecundated ovary in animals; and is formed of the germen, or seed-bud in the centre of the flower; which when fertilised by the male dust of the antheræ, it then, and not before, becomes a *Pericarpium*, pregnant with seed, and gradually swells to maturity, and the seed ripens accordingly. See GERMEIN and SEMEN.

All plants, however, are not furnished with a *Pericarpium*; in default of which, either the receptacle or calyx performs that function, by inclosing the seeds and accompanying them to maturity.

A *Pericarpium* comprises different species or sorts of seed vessels, as follows:

CAPSULA, capsule; a dry hollow seed-vessel, that naturally cleaves or separates in some determinate manner in one, two, three, or more valves, or openings, for dispersing the seeds; so have often from one or two to many valves, as well as loculi, or seed cells, as hereafter hinted. See also CAPSULA.

LEGUMEN, a legumen or pod; a seed-vessel that has two valves or openings, inclosing a number of seeds fastened along one suture or seam only, such as the pea, bean, &c. See LEGUMEN.

SILIQUA, a seed-pod, with two valves, having the seeds attached alternately to both sutures, or joinings of the valves, as in cabbage, turnep, wall-flower, stock-gilliflower, &c. See SILIQUA.

FOLLICULUS; having only one valve, opening from bottom to top, and having the seeds attached to a receptacle within.

DRUPA, a stone-fruit, of a fleshy or pulpy nature, without any valve or external opening, and contains a stone or nut; the cherry, plum, peach, and most other stone fruit, are all Drupaceous seed vessels.

BACCA, a berry; a pulpy fruit without a valve, inclosing a number of seeds; as in the currant, gooseberry, strawberry, &c. See BACCA.

POMUM, apple; a fleshy fruit of the apple and pear kind, without any valve or external opening; having in the middle a membranous capsule of several cells, containing the seeds. See POMUM.

STROBILUS, a scaly fruit of the cone kind; being composed of a number of woody scales, exemplified in the cones of the *Pinus*, fir tree, &c. See CONUS and STROBILUS.

Each of the above species of *Pericarpium*, although of a peculiar structure, yet the same

sort is often of different figures and magnitudes in different genera, as is expressed in their respective *Characters*; as oblong, oval, roundish conical, and various other shapes; and some *Pericarpiums* having from one or two to many valves or openings, particularly the capsule-kind, which, when of one valve, is termed an *univalvular*, or one-valved *Pericarpium*; of two valves, *bivalvular*; of three, *trivalvular*; of four, *quadrivalvular*; of five, *quinquevalvular*; of many valves, *multivalvular*. Likewise different *Pericarpiums* have from one or two to many *loculi*, cells, or lodgments of the seeds; so that when of one *loculi* or cell, it is termed an *unilocular Pericarpium*; of two cells, *bilocular*, of three, *trilocular*; of four, *quadrilocular*; of five, *quinquelocular*; and of many cells, *multilocular*, &c. all of which are fully exhibited as they occur in discriminating the *Characters* of their respective genera; for the *Pericarpium* is always employed as an essential distinction in each genus, and is likewise often used as a descriptive mark in distinguishing the species in many genera.

With respect to the seeds, relative to their number, figure, size, &c. in the *Pericarpium*, it is very different in different genera; as in point of number, they are from one to many hundreds; and their figure and size are also exceedingly various, as is expressed in the *Characters* of each genus, &c. See also SEMEN.

PERIPLOCA, Climbing Dog's-bane, or Virginian, or Virgin silk.

It consists of ligneous, volubilate-climbing exotics for the shrubbery, green-house, and stove, rising with twining stalks about any support many feet high; garnished with oval-oblong and heart-shaped entire leaves, and monopetalous, wheel-shaped, five-parted flowers in clusters.

Class and order, *Pentandria Digynia*.

Characters.] CALYX is five-parted and permanent. COROLLA is monopetalous, rotated, plane, and divided into five narrow segments, and with a very small nectarium surrounding the centre of the corolla. STAMINA, five short incurved filaments, and erect antheræ. PISTILLUM, a bifid germen, two cylindric styles, and headed stigmas. PERICARPIUM, two large, oblong, ventricose, unilocular follicles, filled with numerous imbricated seeds crowned with down.

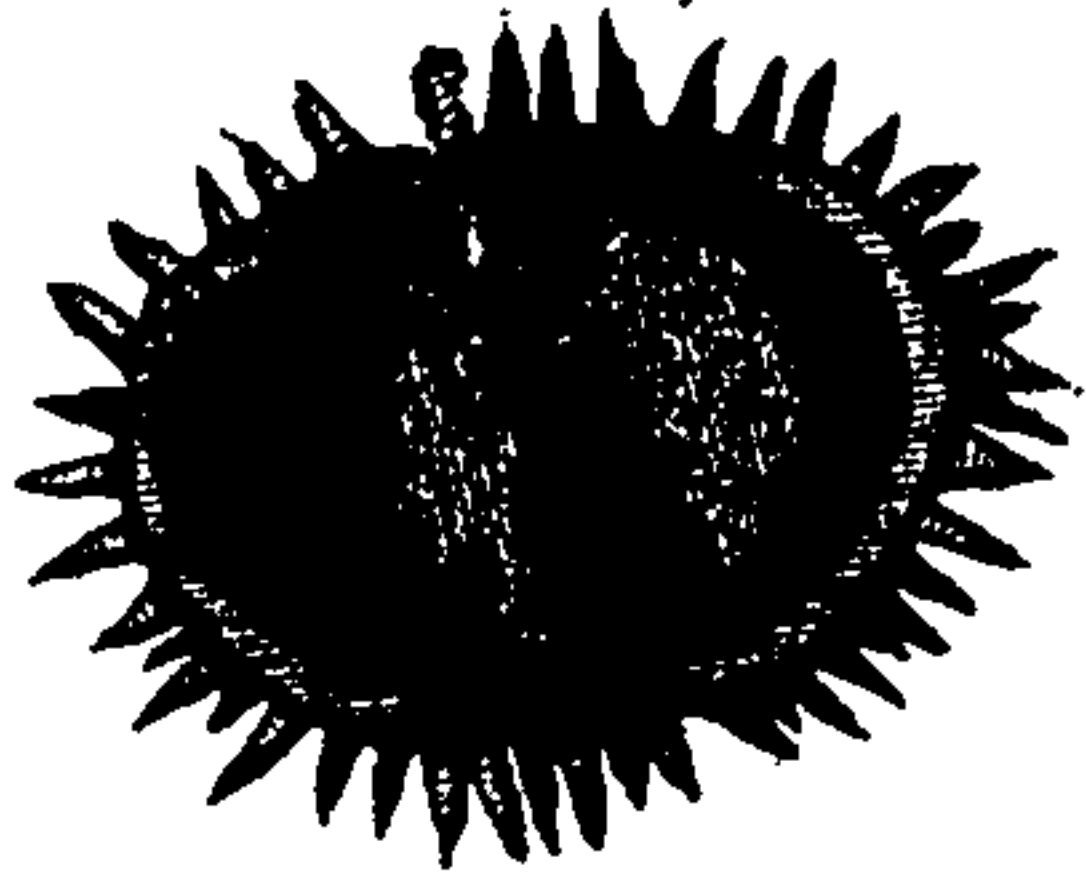
There are but three or four species, all exotics from distant countries, of which one is hardy for the shrubbery, one for the green-house, and the other for the stove.

1. PERIPLOCA *græca*.

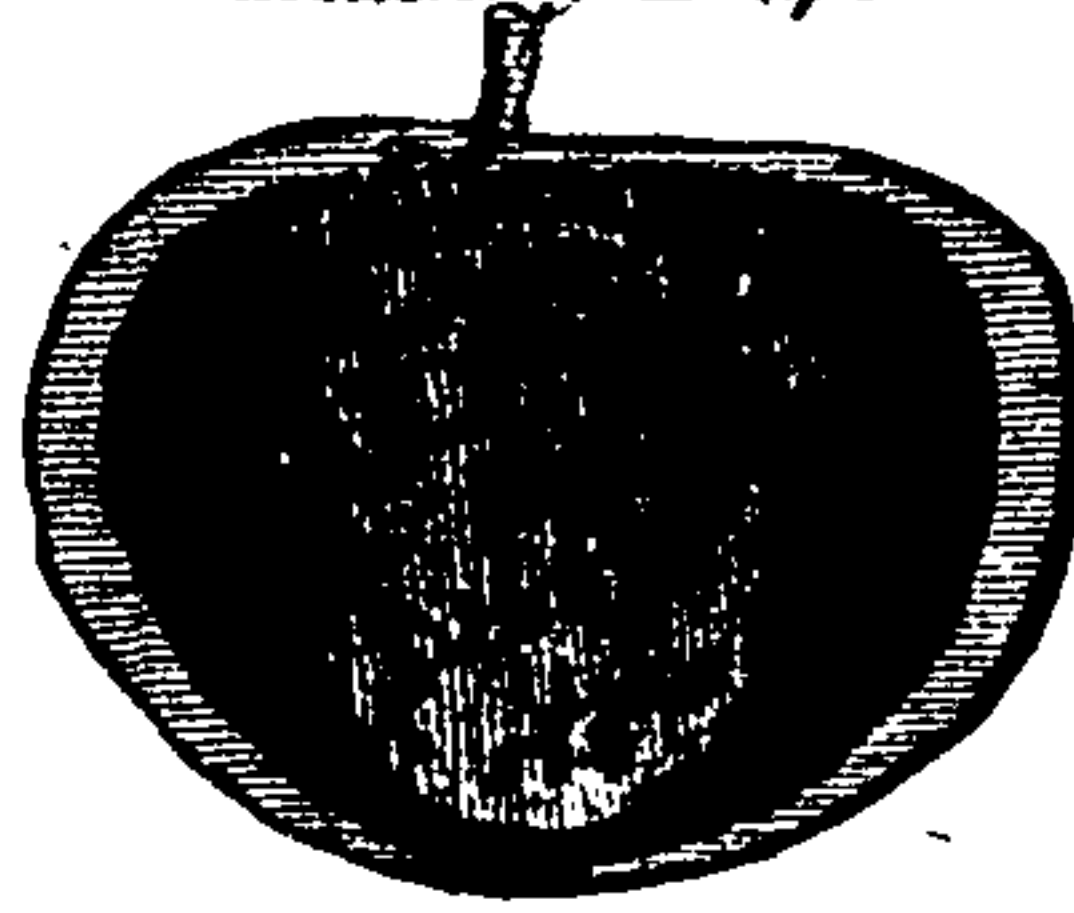
Grecian

PERICARPS or FRUIT & SEED VESSELS.

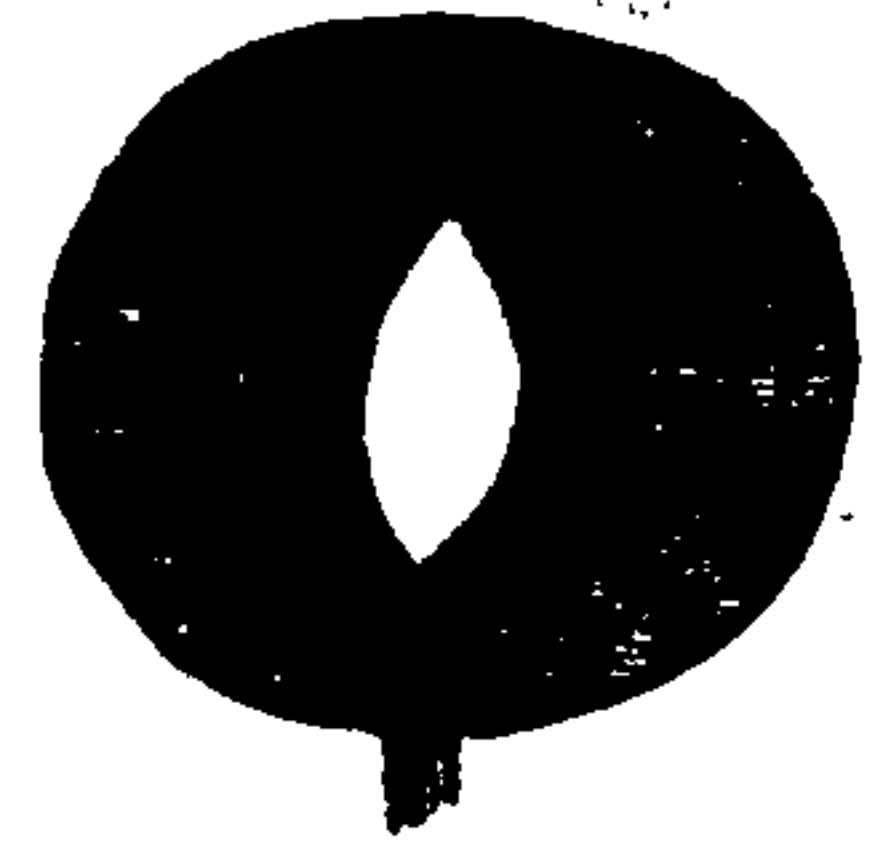
Echinate Capsule



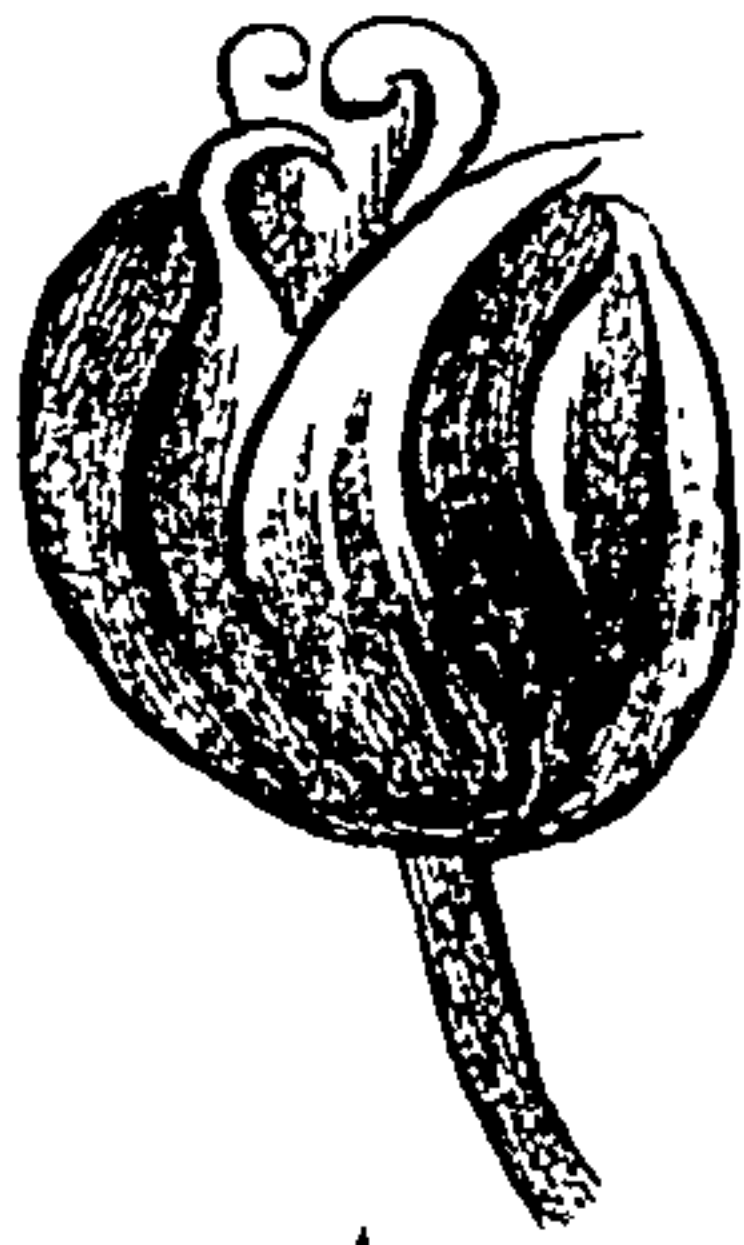
Leathery Drupe



Fleshy Drupe



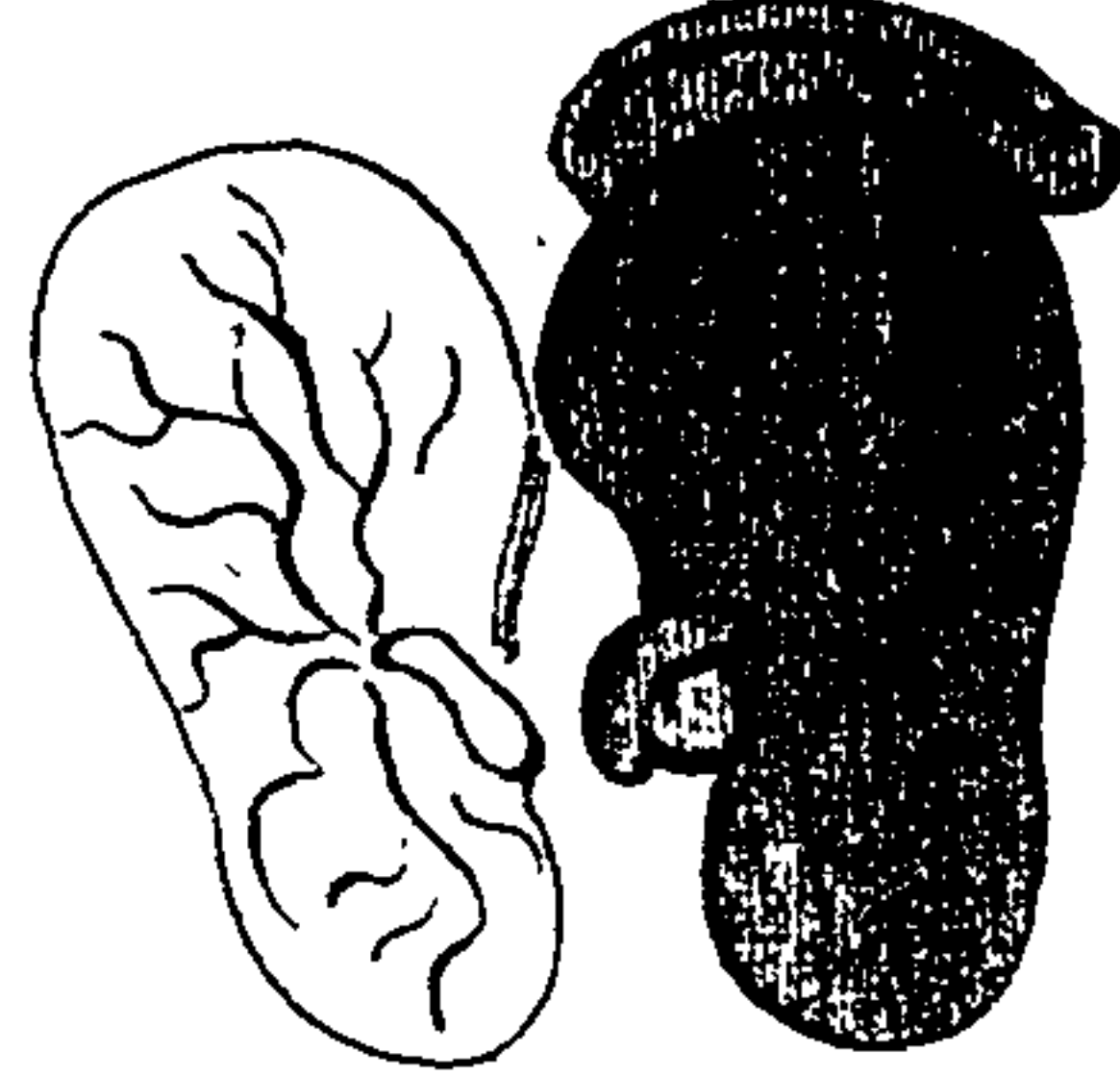
Capsules



Cylindrical Seed



Beans split open



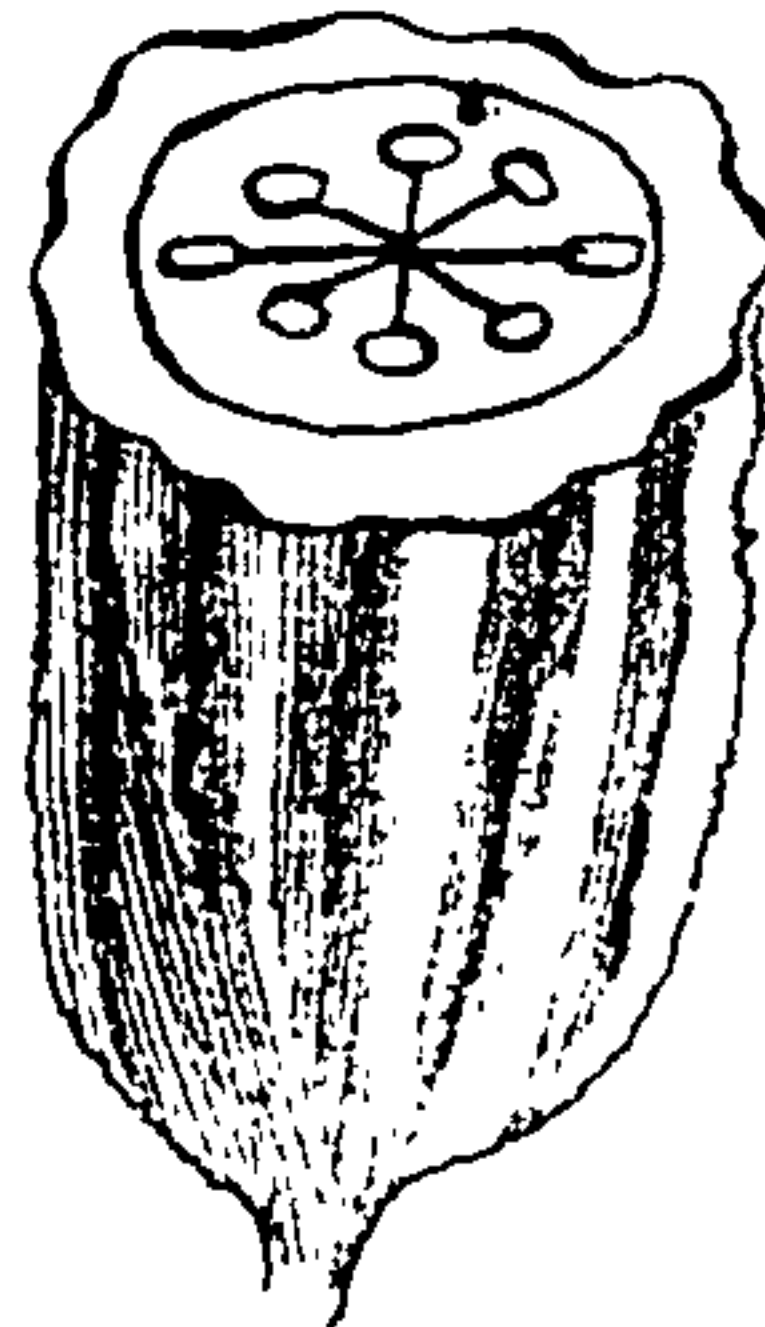
Pappous Seed



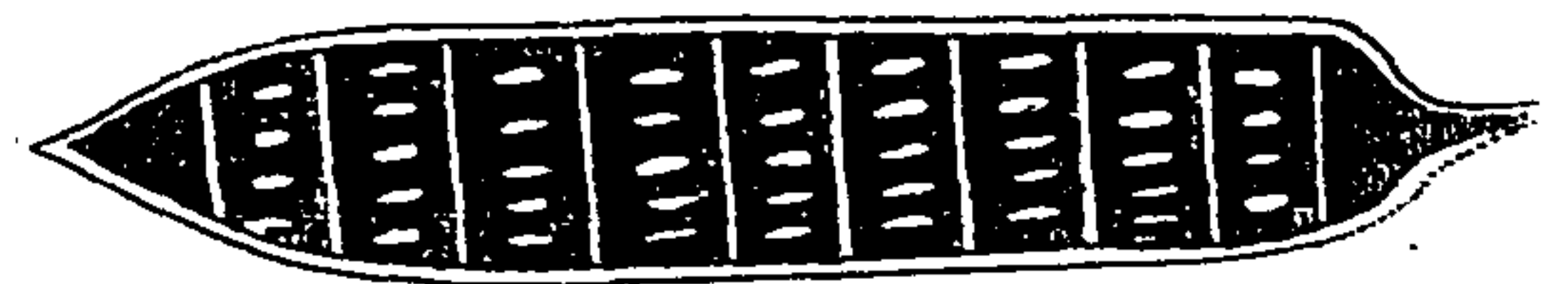
Silique



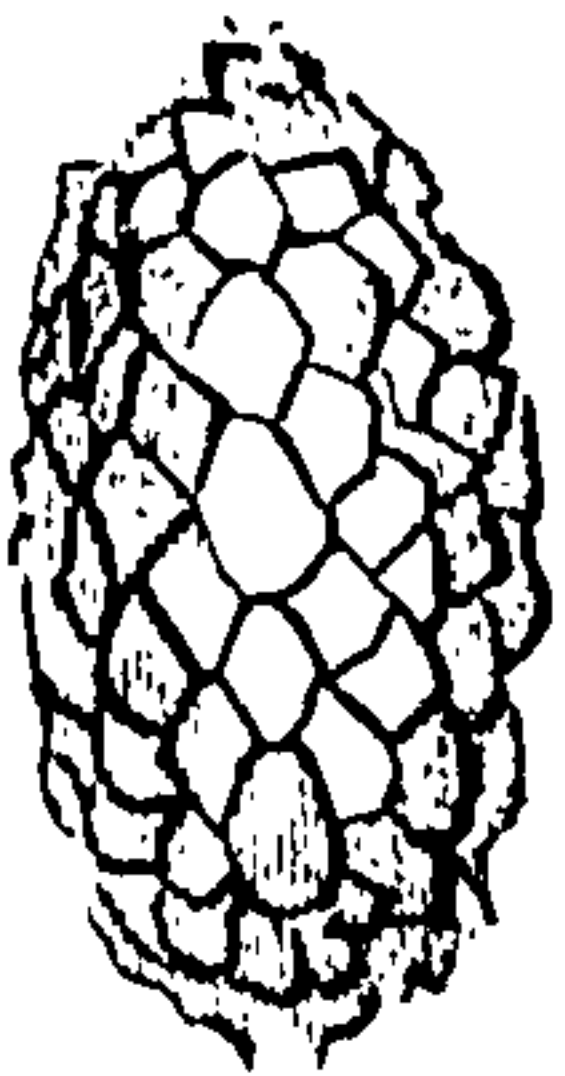
Bacca Berry



Oblong Pod with Partitions



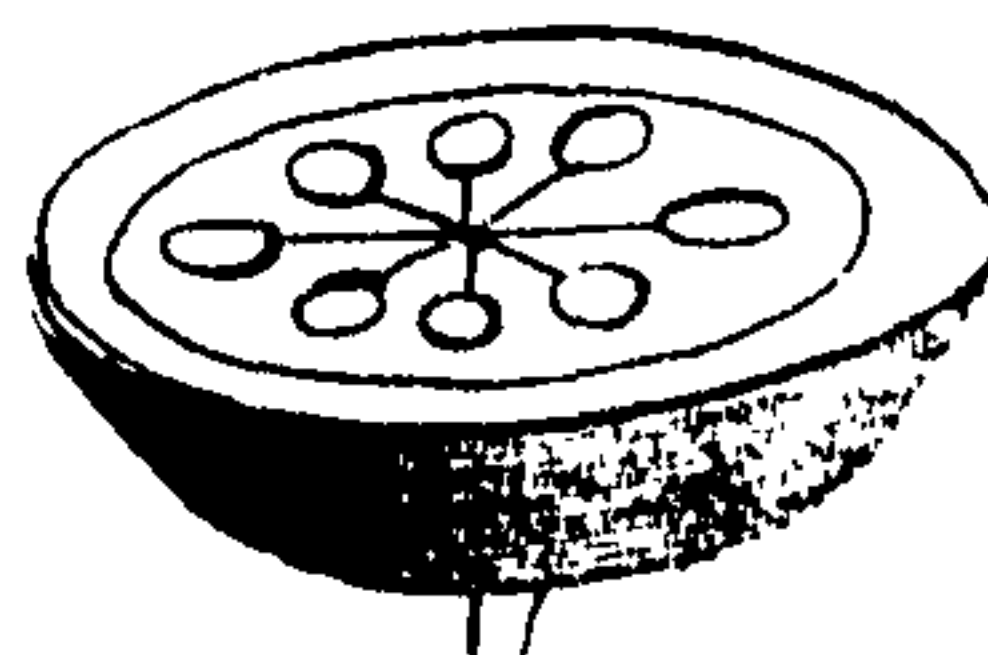
Strobilus or Cone



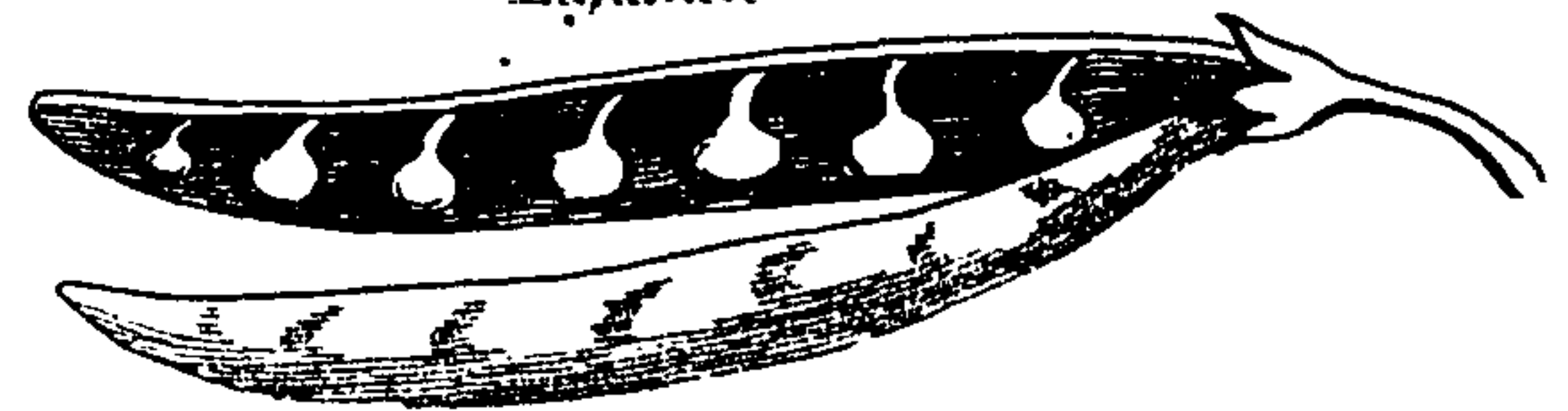
Winged Seed



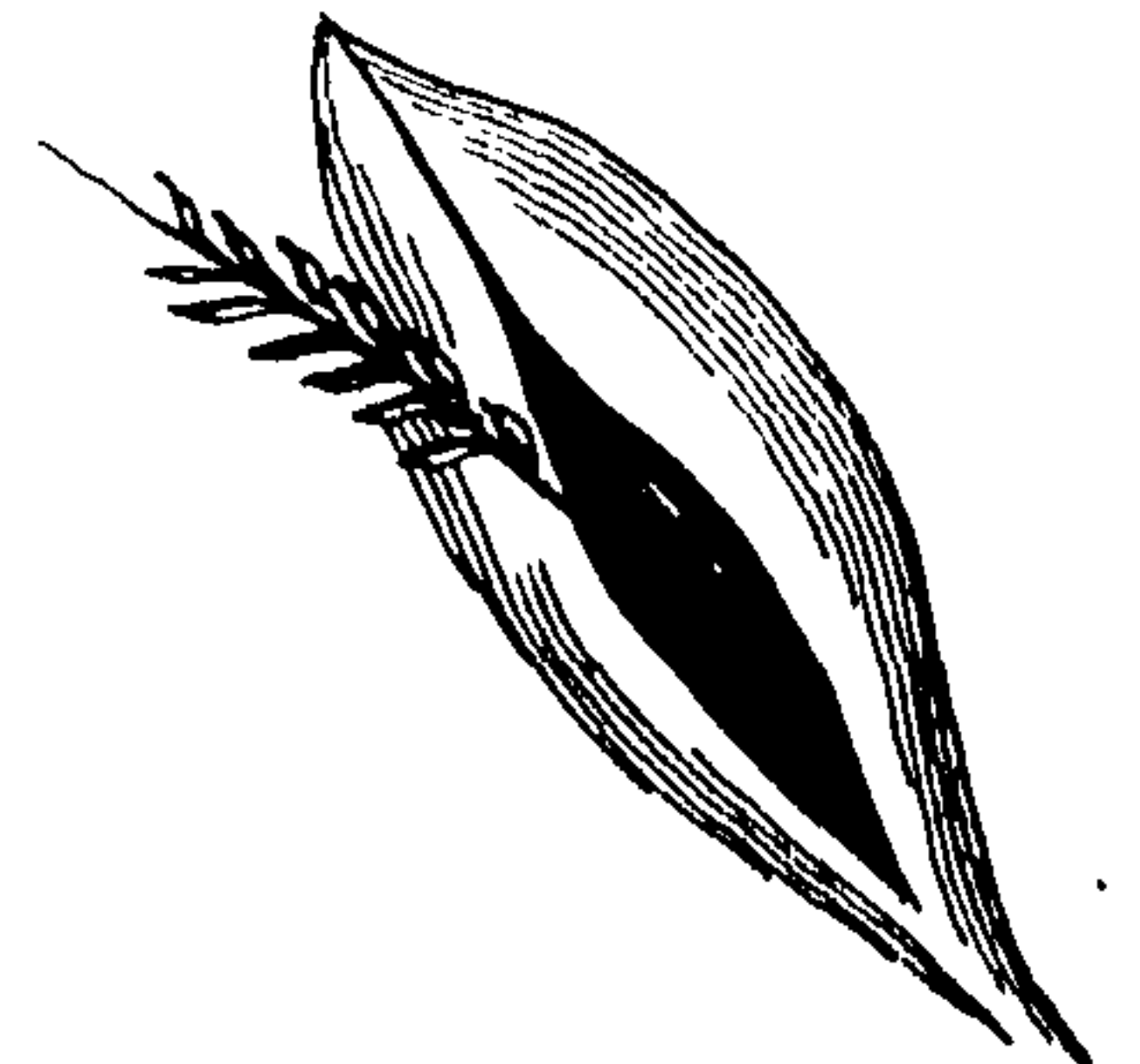
Bacca Berry



Liquen



Folliculus



Grecian Periploca, or Common Climbing Dog's-bane.] Hath shrubby, long, volubilate-climbing, branchy stalks, winding round any support thirty or forty feet high; large, oblong spear-shaped leaves, opposite by pairs, of a shining-green above, and whitish underneath; and at the axillas towards the ends of the shoots small clusters of purple flowers, hairy within.

2. *PERIPLOCA africana.*

African Hairy-Stalked Periploca.] Hath ligneous twining hairy stalks, rising upon support three or four feet high; ob-oval hairy leaves, by opposite pairs; and from the sides of the branches small clusters of purplish flowers.

Varieties.] Smooth-stalked African *Periploca*—sinuated leaved.

3. *PERIPLOCA indica.*

Indian Periploca.] Hath shrubby, slender, volubilate-climbing stalks, rising by support several feet high; oval-spear-shaped, smooth leaves; and flowers in imbricated spikes of different colours in the varieties.

These three plants flower principally in July and August, generally in small bunches; each separate flower is of one plane petal, cut into five segments; but are rarely succeeded by seeds in England.

These plants are retained in many of our gardens, to add to the variety of climbers.

The first sort in particular is a fine volubilate-climbing plant for the shrubbery. It will readily wind its stalks and branches round any adjacent tree, hedge, pole, or any thing it encounters in its progress, and rise to a prodigious height; and in default of any neighbouring support, it will twine and entangle its branches round one another in a complicated manner; but it should generally be allowed support, and it will show itself to much greater advantage.

The second and third species should always be kept in pots, placing the former among the green-house exotics to have shelter in winter; and the latter placed always in the stove.

The propagation of all the sorts is easily effected by layers of the young wood, which if layed in the spring, or early in summer, will be rooted sufficiently by autumn, and may then be transplanted; the hardy kind into the nursery, the others in pots.

Cuttings of the first sort will also often succeed; likewise of the other two, by aid of a hot-bed.

They may also all be raised from seed procured from abroad; which should be sown in spring in pots, and plunged into a hot-bed, especially of the second and third sorts.

PETALUM, Petal, or flower-leaf, the corollaceous fine-coloured part of a flower, constituting sometimes the whole, when monopetalous or of one piece, or when divided into two, three, or many, forms one of the parts of the corolla; and, in both of which, surrounds the organs of generation; so that the corolla consists either of one petal, or of many: in the first case, it is termed monopetalous, in the second, polypetalous. See **COROLLA**.

PETIOLUS, the foot-stalk of the leaves only, very different from the *Pedunculus*, the foot-stalk of the flowers; for it is in very few instances that either the same *Petiulus*, or *Pedunculus*, supports both leaves and flowers; Linnæus, therefore, has very properly marked their distinction, by assigning each a different name.

The *Petiulus*, or foot-stalk of the leaves, is very commonly furnished with two distinct surfaces, a front and a back; the former flat, the latter round.

Some leaves, however, have no foot-stalks at all, but are close-fitting, or *sessile*. See **FOLIUM**.

PETIVERIA, Guinea Hen-weed.

In this genus are two ligneous, evergreen, exotic perennials, of the West Indies and America, introduced here in our collections of stove-plants, growing with ligneous, jointed stalks, two or three feet high, furnished with oblong leaves, and terminal spikes of small white flowers, having five-leaved cups, four cruciform petals, six or eight stamina, an oblong germen supporting four styles, succeeded by a short seed-vessel with one seed.

Class and order, *Hexandria Tetragynia*.

The species are,

1. *PETIVERIA alliacea.*

Alliaceous Guinea Hen-weed.] With oblong-ovate leaves, and flowers having six stamina.

2. *PETIVERIA oelandria.*

Oelandrious-flowered American Petiveria.] With oblong stiff leaves: and flowers having sometimes eight stamina.

Both these species are natives of hot countries, requiring protection here in our stoves; in which they are retained for variety, to diversify the collection of exotics in those departments, as evergreens and flowering plants, and for the remarkable singularity of their alliaceous, or garlicky smell.

They are propagated by seed, slips and cuttings, in pots, placed in the bark-bed, to forward the vegetation in any of the different methods.

PETREA, (*petrea*,) a climbing shrubby stove

stove exotic, garnished with spear-shaped leaves, and monopetalous wheel-shaped flowers.

Class and order, *Didynamia Angiospermia*.

Characters.] CALYX, a monophyllous and bell-shaped cup, with the border five-parted, spreading, large, coloured, and persistent. COROLLA, monopetalous, unequal, wheel-shaped, and less than the cup. STAMINA, four filaments, two of which are longer than the other, and topped with oval, erect antheræ. PISTILLUM, an oval germen, simple style, with an obtuse stigma. PERICARPIUM, an oval, two-celled capsule, placed in the bottom of the cup, containing a single fleshy seed.

There is but one species,

PETREA volubilis.

Twining Petrea.] Hath a woody climbing stalk, rising ten or twelve feet high, furnished with long branches, garnished at each joint with stiff lanceolate leaves; the branches are terminated by loose bunches of flowers, nine or ten inches long, on slender foot-stalks; the cup of each is larger than the corolla; is of a rich blue colour, and the petals are white: these are succeeded by capsules, containing each a single seed.

This plant is propagated by seeds obtained from the West Indies: these must sown on a hot-bed, and when the plants are up, transplanted into pots, and plunged into the bark-bed in the stove, there to remain.

PHASEOLUS, Kidney-bean.

This noted genus consists principally of herbaceous annuals; one species of which, *common Kidney bean*, is the chief, and is a most valuable leguminous vegetable, comprising many excellent varieties, both dwarf-growers and high-climbers, garnished universally with trifoliate leaves, and papilionaceous hermaphrodite flowers, succeeded by long leguminous seed-pods, which, whilst young and tender, are fine culinary esculents, and the principal eatable part of the plant, also sometimes the ripe seed or beans contained in them.

Class and order, *Diadelphia Decandria*.

Characters.] CALYX is monophyllous and two-lipped, the upper one emarginated, and the under tridented. COROLLA is papilionaceous, with a heart-shaped vexillum, reflexed on the sides, oval wings as long as the vexillum, and a narrow keel, twisted contrary to the sun's motion. STAMINA, ten diadelphous filaments, and single antheræ. PISTILLUM, an oblong, compressed, hairy germen, a filiform, inflexed, spiral, downy style, and obtuse hairy stigma. PERICARPIUM, a long, thick, coriaceous, pointed

pod, containing kidney-shaped compressed seeds.

There are several species of *Phaseolus*, but of which we have only one original principal species of the esculent kidney bean, comprehending many fine varieties: and is the parent species of all those noted kinds, known in our gardens, both dwarf-growers and climbers.

The species is,

PHASEOLUS vulgaris.

Common Kidney-bean.] Consisting of the following principal varieties in two classes—dwarf-growers—and high-climbers, or runners.

Dwarf Kinds.

Phaseolus nanus—or Dwarf Kidney-Bean.]

These plants rise each with a very short stem, branching out low into a bushy head, from about ten or twelve inches to a foot and a half high, rarely sending out runners; garnished with trifoliate leaves, and clusters of white or purple flowers, in different varieties, succeeded by long, narrow, hanging seed-pods.

Principal Varieties are,] Early, white dwarf Kidney-bean—early speckled dwarf—early yellow—early liver-coloured—early dun-coloured dwarf—larger white, or cream-coloured dwarf—larger black and white speckled dwarf, a good bearer—black-streaked dwarf—red speckled dwarf—speckled amber dwarf—sparrow-egg dwarf—Canterbury white dwarf, a great bearer—Battersea white dwarf, also a very great bearer. China speckled dwarf, consisting of black and white speckled, brown and white, red and white, &c. All of which kinds are of upright dwarf bushy growth, rarely exceeding fifteen or eighteen inches height; and seldom throw out runners, except the Canterbury and Battersea sorts, which sometimes emit a few stragglers, but they seldom ramble far.

Observe that with respect to the above-mentioned colours of the varieties, it alludes to that of the beans or seed, which also often vary to several other intermediate colours and variegations.

Of the above varieties of dwarf Kidney-beans, the first three or four sorts are at present in esteem for their coming earliest into bearing; they being of smaller growth than the other sorts, and sooner form themselves for blossom and bearing, so are proper to plant for the earliest crops, and for forcing in hot-beds, &c. As they, however, do not continue long in bearing, they are not so proper for the main crops, as the other larger dwarf sorts; particularly the black and white speckled, the Canterbury and Battersea kinds, which are all excellent bearers; but the two latter most of all, and the pods are smaller,
more

more numerous, and esteemed the sweetest eating of all the dwarf kinds whilst young, though the pods of the large white dwarf, and the speckled kind in particular, continue exceedingly good, even when of pretty large size, but superior in the latter, both in a more plentiful longer production, and goodness for eating, and is excellent for a principal crop in a family garden; as are also the Battersea and Canterbury sorts, which should not be omitted on the same occasion; and these two varieties are in most esteem for general culture by the market-gardeners in the neighbourhood of London, for the main crops, as being by them considered both as the most profitable in bearing, and being a smaller pod, the most saleable in the markets: however, any of the other dwarf sorts are also eligible to cultivate less or more, occasionally, for variety, both for private and public supply.

As all these dwarf Kidney-beans are of upright growth, without emitting any very rambling runners, they do not require support, like the climbing kinds; so may be cultivated in drills not more than two or three feet asunder. See their *Propagation and Culture*.

Climbing Kinds, or Runners.

PHASEOLUS volubilis.

Climbing, or Runner Kidney-bean.] The plants rise with a short stalk, emitting several long, slender, twining runners, winding round any support, many feet high; garnished with large trifoliate leaves; and at all the joints, as the runners advance, large clusters of scarlet or white flowers in the different varieties.

Of the climbing sort are the following principal varieties.

Large scarlet climber.—Rises with many twining runners upon support, eight or ten to twelve or fifteen feet high, having numerous large clusters of scarlet flowers; succeeded by large, thick, rough, fleshy seed-pods, containing large, thick, purplish beans.

Variety of this.] Large white climber, having large clusters of white flowers, large, thick, rough seed-pods, and white seed.

Both these sorts are alike in every respect of growth, and only differ in colour of their flowers and seed, as above; which is pretty permanent: they are both extraordinary great bearers; and the plants of the same crop continue in bearing from July or August until October; and the pods of both sorts, even when large, boil exceedingly green, and are remarkably tender and well flavoured.

Large Dutch Climber.—Rises with twining runners, upon support, ten or twelve feet high;

numerous clusters of white flowers, succeeded by long, broad, compressed-flat, smooth pods, containing large, oblong, flat, white seed.

This variety is also a very great bearer, but it does not continue near so long in production, as the two former-climbers; its pods however, which are very long, smooth, and fleshy, boil exceedingly green, tender, and good: and, of the runner kind, it is a very desirable family bean, inferior to none for sweetness of eating.

The following climbers are of more moderate growth.

Negro runners—Battersea white runners—Canterbury runners—variable runners. All of which, though climbers, do not ramble so extensively as the scarlet kinds, but bear plentifully, of some considerable continuance and abundance; and the pods, smaller than those of the foregoing, are very tender, delicately good eating, while in moderately young growth.

Thus far includes all the principal varieties of the *PHASEOLUS vulgaris*, or common Kidney-bean, both of the dwarfs and runners, that have merit for general culture.

The name, kidney-bean, is derived from the reniform-shape of the seed or beans; though about London, and some other places, they are very commonly called French-beans, probably from being first introduced from that country; the former, however, is the most eligible, proper general name, both for the dwarfs and runners.

In the different varieties, both of the dwarfs and climbers, the shape and size of the seed-pods and seed vary a little; that is the pods are generally long and narrow, i. e. from about three or four to six or seven inches long, and from about a quarter of an inch to an inch broad, and mostly compressed, but in some are more flattened, and thinner than others, and some incline a little to a cylindric form, and of thicker substance; those of some of the climbers are much larger than the dwarfs: observing in general that as the young green seed-pods are, in this country, the principal edible part of the plants, those of the thickest fleshy texture that break crisp and tender, are generally preferable. And as to the seed, it is most commonly kidney-shaped, though some incline a little to an oval form, and some roundish: in some varieties it is very small, some middling, and some large; and according to the size of the seed, the plants of the respective varieties are generally smaller or larger in proportion; the ripe seed in some countries is also preserved for eating in winter. But the most estimable part for use in England is the young pods.

as aforesaid, whilst they are green and tender, before the seed in them acquires any considerable size; they are thus boiled and eaten as sauce to flesh meat; the quite young pods are also in great estimation for pickling, and make a very delicate pickle for use all the year: the middling young pods are also often salted down in barrels, or earthen vessels, for winter use, in which they will keep exceedingly fine several months. The ripe seed also, as above hinted, of the white kinds, is sometimes boiled for eating, but more generally in France, Germany, and some other parts on the continent, where they are constantly preserved for winter use, as we do dried peas; which they stew and make very palatable with butter, gravy, and other sauces.

All the varieties of the kidney-bean, both dwarfs and runners, are annuals; and being originally exotics, from hot parts of the world, they, in this country are rather of a delicate temperature, impatient of cold, and not able to bear the open air here only in summer; they being raised from seed in April, May, and June; and the first autumnal cold, in October or beginning of November, puts a period to their existence.

General Observations on their Culture.

As Kidney-beans are universally of the annual tribe, as before observed, a fresh supply must be raised every year from seed; and as the plants of the dwarf kinds rarely continue in bearing longer than three weeks, several different plantings or sowings are necessary from April until July; but some of the climbing sorts will continue bearing two or three months. Observing of all the sorts, that, as being exotics of a tender nature, they will not succeed to sow in the full grown till April and May; the former of which is the earliest time for putting in the first crop, which will come into blossom in June, and by the latter end of that month will be succeeded by young pods fit to gather; and by different sowings may continue a succession of crops, bearing from June until October; but by aid of hot-beds or hot-houses, may raise some dwarf kinds very early in the year, to gather in February or March and April, &c. though the most effectually certain, by the accommodation of a hot-house or stove, in which may obtain them in the earliest season of spring, in greater perfection and abundance.

The dwarf sorts are proper for the early and general summer crops; and for the supply of markets, where large quantities are required, they are the only proper sorts for general culture, both because they require much less room to grow, and less trouble in their

culture than the climbers, as not requiring to be staked; and the produce is generally more saleable, though not better for eating, only are to many persons more agreeable to the eye. To have a constant supply of these dwarf sorts in the natural ground from the earliest to the latest period, three or four different sowings, at least, are necessary from the beginning or middle of April until the middle or latter end of July; and where required to have them as early as possible, some should be sown in hot-beds, or in a hot-house, in January or February and March; or in a hot-house they may be planted in the beginning or middle of winter, even to have a few young beans about Christmas or soon after, and continued in succession till those in the common hot-beds, or in the natural ground, come into bearing.

The climbing kinds are, for the most part, wonderful great bearers, particularly the scarlet sort, and its white variety, which in the same crop often continue bearing plentifully from July or August, until killed by the frost or cold in October; but all the climbers continue in bearing much longer than the dwarfs; for as their runners continue branching and shooting in length two or three months, they, according as they advance, continue sending forth large clusters of blossoms, succeeded by a proportional quantity of fruit: none of the climbers, however, are adapted for early crops; but succeed remarkably well for a secondary main crop, to supply the table from about the middle or latter end of July until October, especially in private gardens, where only moderate quantities are required, and that have convenience of sticks, poles, rails, &c. for their runners to climb upon; for without such assistance, they would trail on the ground, and entangle with one another in a confused manner, and be liable to rot, without affording a quarter of a crop: they should therefore all have sticks, or some other means of support, and they will bear amazing great crops. But in the public kitchen-grounds, where considerable quantities of Kidney-beans are requisite for the supply of the markets, the climbers are not so proper for any general crop, on account of the great trouble they would require in sticking: besides, as before observed, they are not so saleable as the dwarf sorts, though they are equally good, if not superior to some of those kinds, for the table; so that any of these climbing or runner kinds, as may be approved of, are eligible for culture, in variety with the dwarf sorts in full crops; but rather as secondary, than for the principal general productions for the table. Observing, as all the climbing kinds run up, by support, very tall,

and branch out into lateral runners all the way, they require large scope to grow, so should generally be planted in drills, four feet at least asunder.

The scarlet-runner is also often employed as a climbing flowery plant for the singularity and long continuance of its numerous flowers; sometimes, likewise, its white variety, planting them in patches alternately in any of the compartments; also to run over arbours, or up the sides of houses, upon suspended lines, or to form shady walks, &c.

The general season in which the main crops of all the sorts of Kidney-beans arrive to perfection in the full ground, is July, August, and September; or by early and late planting, may have them from June till October: observing that a constant succession during those months is obtained by three or four different plantings, from the middle of April until July, as before hinted; which repetition of plantings is absolutely necessary for the dwarf kinds, which do not continue bearing long, some not more than a fortnight, others three weeks or a month; but as to the climbers, as they continue shooting and flowering all summer, until prevented by the cold in October or November, two different plantings of these sorts, one early in May, the other in June, will furnish an abundant supply of young beans during the whole season.

But, as before remarked, that in order to have a long succession of Kidney-beans for the table, different modes of culture are practised, as the raising both dwarfs and climbers in the full ground for the main crops; and by artificial heat, in different ways, for the dwarfs in particular, to have very early crops.

The particular culture, however, both of the dwarfs and climbing sorts, is practically explained below, each under its proper head.

Propagation and General Culture of the Dwarf Kinds in the Full Ground.

All the dwarf Kidney-Beans, as well as climbers, are propagated by seed annually; and the season for planting the natural crops in the full ground, is spring and summer, at several different times from April until July, in order to obtain a daily supply of young beans during the whole season.

Observe to chuse the proper sorts for the different crops; that is, for the forward crops, you may use any of the early dwarf sorts; but the early white, early speckled, dun, and yellow kinds are rather the earliest bearers; and for the main crops any of the larger dwarf kinds may be proper, though I should give preference to the speckled dwarf and the Battersea and Canterbury dwarf kinds, they being all plentiful

bearers, and continue long in successive bearing on the same plants, as observed in their description.

It must be remarked, as already hinted, that, as Kidney-beans are of a tender nature, they do not admit of being sown or planted earlier than April, when the weather is become a little settled; for the seed is not only impatient of cold moisture in the ground, and very subject to rot, but the young plants that happen to come up early, are often cut off, or greatly injured by the morning frosts, or cold cutting winds, that frequently prevail in April and beginning of May. But towards the middle of April, if the weather is fine and dry, we may venture to plant pretty freely in a warm dry situation and light soil, for the early natural crops; and in the latter end of that month, or beginning of May, it is proper to begin to put in the first general crops in the open quarters, &c. and so continue planting some every fortnight or three weeks until the middle or latter end of July: whereby you will have a regular supply of young Kidney-beans for the table or market from about the middle or latter end of June until October, as aforesaid.

If, however, you are desirous to try to have them as early as possible in the full ground, you may put in a few about the beginning or middle of April, in dry weather, close under a warm wall, to take their chance; and in a fortnight after put in some more, in a larger portion; if the first should fail, these may succeed; and if both are attended with success, one will succeed the other in bearing: though it is two to one against the equal success of the first: but as only a few should be planted so early, if they fail, it is only the loss of a little labour and seed, for the same ground will do again; and if they succeed and produce only a few, but a week sooner than common, they will be esteemed a rarity, either for family use or market.

They all succeed in any common soil of a garden, remarking, however, that for the forward crops it is absolutely necessary to select a dry light soil, rejecting heavy and wet grounds, for in such a soil most of the early-planted seed would infallibly rot. Likewise for the early crops it is highly requisite to chuse a sheltered warm situation full to the sun: a warm south border is a very eligible exposure; but for the main crops, any of the open quarters are proper.

The method of sowing or planting all the sorts is in shallow drills, from two feet to a yard asunder, and are all to remain where sown. Observing the following hints.

For the early crop, chusing a warm border, and taking advantage of a dry day, draw neat drills with an hoe, from north to south, two feet or thirty inches asunder, and near an inch deep; and to have a greater chance, I would draw also a drill close along under the wall, where practicable; in these drills drop the beans in a row along the bottom, only about an inch and a half asunder, as many of this early sowing may fail; covering them evenly with the earth, not more than an inch deep; for if covered deep at an early time, many are apt to rot, by the cold damp of the earth: as soon as they are covered in, lightly rake the surface smooth, and the work is finished. They will come up in about twelve days or a fortnight: managing them as hereafter directed, and the plants will come into bearing in six or eight weeks.

For the main crops intended to be planted in May or June, &c. you may employ almost any situation, either in borders, or in an open exposure; though an open situation in any of the large quarters is the most eligible. Drawing drills two feet and a half asunder, and about one inch deep; or, if designed to plant rows of favoys or cabbage-plants between, as is often practised when necessary to husband the ground to the best advantage, the drills should be a yard asunder at least; drop the beans singly along the bottom of each drill, about two or three inches asunder, covering them in evenly with the earth about an inch deep, and finish with a light raking to smooth the surface. They will come up, at this season, in ten or twelve days, and sometimes sooner in fine weather; and the plants will come into bearing plentifully in July and August.

In the above manner continue planting some every fortnight or three weeks until July, as we before advised; and you will have a plentiful daily supply of young beans, from June until Michaelmas, or sometimes longer.

In planting the latter crops in June and July, when the weather proves very dry and hot, and the ground also very dry, it is proper either to soak the beans a few hours in soft water previous to planting; or, instead of this, let the drills for the reception of the beans be well watered, and immediately plant them as above, and cover them in the proper depth. Either of these methods is very advisable in dry weather in the heat of summer; it being necessary at such times to promote the free germination of the seed, to bring them up soon and regularly, which would otherwise rise in a straggling manner.

When the plants of all the above crops

are come up, their general culture is, as follows.

They are in general to remain where sown or planted, to yield their produce; observing to keep them clean from weeds by occasional hoeing in dry weather; and when the plants are advanced about three or four inches high, hoe up a little earth to their stems on each side, which will forward their growth, and promote their strength: continuing the care of destroying weeds as often as their growth shall render it necessary; which is principally all the culture required for the dwarf Kidney-beans in the full ground till they arrive at a bearing state, and their produce is fit to gather, except to the earliest crops on warm sunny borders, in very dry hot weather, when it would be beneficial to give occasional waterings to the plants in mornings or evenings, especially when in blossom, and fruiting.

With respect to gathering the produce of these sorts of Kidney-beans, it should always be performed when the pods are quite young, or at least before they become large, and the beans in them attain any considerable size, as they would then be tough, stringy, and rank-tasted; and in order to continue the plants in bearing as long as possible, the gathering should be regularly repeated two or three times a week; for by gathering the pods often and clean, as they become fit, the plants will blossom more abundantly, and continue fruiting more plentifully and longer accordingly.

Great quantities of these dwarf kinds are cultivated in the gardens and fields in the neighbourhood of London, for supplying the markets, from June till October.

Propagation and Culture of the Runners or Climbing Kinds.

The propagation and culture of the climbing Kidney-beans, commonly called runners, is,—they are all raised from seed annually in spring and beginning of summer, as observed of the dwarfs; and their general culture is nearly the same as for those sorts in the full ground; only they require more room to grow, and must have tall sticks or poles placed for their runners to twine or climb upon, as already noticed. Observing, none of these climbing kinds are proper for early crops, neither in the open ground or hot-beds; so should be cultivated principally for summer and autumn crops, to come into bearing from July or August, till Michaelmas.

Of these climbing kinds I should recommend the scarlet runner and its white variety, for the general crops, they being both extraordinary great bearers; continuing in perfection

tion two or three months; and their pods, when even pretty large, remain green, fleshy, tender, and well flavoured. Some of the Dutch runners, and any of the other climbers, also merit culture.

The most eligible season to begin planting the main crops of all these runner sorts is the first or second week in May, if the weather is fine; for being of a delicate nature like the dwarfs, if planted earlier, both the seed and plants are subject to danger from the same causes; however, in a south border, or some similar warm situation and dry soil, a few may be planted in the middle or towards the latter end of April, to take their chance; but remarking, that for the general crops, the most successful season for planting is from May, as aforesaid, until the middle or latter end of June, or not later than the beginning of July; but if you plant principally the scarlet kind and variety, one planting in May and beginning of June will come into bearing in July or August; and if you keep gathering the pods clean, according as they are fit for use, the plants will continue shooting, blossoming, and bearing abundantly until the end of September, or often until the end of October, or till destroyed by the cold; but two plantings of any of the sorts of runners, one in May and the other in June, or early in July, will furnish a very abundant supply the whole season of Kidney-beans.

All these climbing kinds will prosper almost any where in a garden, both in close and open situations: choosing principally a lightish soil, especially for the forward crops; and the richer the ground, the better.

Observe, that as all the running kinds require support of some sort to climb upon, they should be planted either in wide rows, for the convenience of placing tall sticks or poles along each row for the runners of the plants to wind themselves for support; or planted against some sort of fence or treillage work for the same purpose of training up and supporting the runners. When, however, it is designed to train them upon sticks or poles, let drills be drawn four feet or four and a half asunder, especially for the larger kinds, and an inch deep; in which drop the beans, three or four inches apart: cover them in evenly with earth, and rake the surface smooth. The beans will sprout in a few days, and come up in less than a fortnight.

When the plants are three or four inches high, draw a little earth with an hoe up to their stems, to strengthen them and encourage them to send forth strong runners. At this time also cut down all weeds between the rows.

As soon as they begin to push their runners, begin to place some tall sticks or poles for them to ascend upon: as you place the sticks, conduct the runners towards them, in a direction according to their natural mode of climbing, which is generally to the right or contrary to the sun's motion: they will thus naturally encircle the sticks or poles, and ascend to their tops, even if ten or fifteen feet high, producing blossoms and fruit from bottom to top.

When intended to plant these sorts against fences for support, plant them in a row close along to the fence; and, if against a wall or paling, may either place tall poles, or draw some strong packthreads from top to bottom at six inches distance; the plants will readily twine round them, and support themselves.

In gathering the produce of all these kinds, observe the same as of the dwarfs, to gather the pods whilst young and tender; and to continue the plants long in full bearing, always gather the pods clean as they become of proper size; and they will continue fruiting more abundantly.

If you intend cultivating any of these climbing Kidney-beans as flowering-plants, the scarlet kind and its variety, as before suggested, are the proper sorts. Sow them any time from about the middle or latter end of April until June in any of the compartments of the pleasure-garden, in patches, alternately scarlet and white sort, two or three beans in each patch, about an inch deep; and when the plants are up and begin to push runners, place tall poles or branchy sticks for them to climb upon: they will effect a very fine variety all summer, until October.

They are also often employed to run over arbours, and to twine round lines, from the top of tall stakes, and stems of small trees; also to run up along the sides of houses, or against walls, either upon poles, or upon packthread-strings, suspended from above, about which they will twine themselves many feet high, bearing abundance of flowers and fruit: they are likewise sometimes trained to form shady walks, by means of sticks or poles arranged along each side, or by support of a sort of treillage-work, ranging some tall stakes five or six feet asunder, railing them along the top with poles, or pan-tile laths, or extend strong packthread lines; and from either of which suspend strings to the ground, six or eight inches asunder, fastening them down with pegs: upon these strings the plants will climb and form a close hedge; or might occasionally arch over the top in a similar man-

ner, for the runners to extend, and form a vaulted roof and complete shade. Thus this fine climber may be trained in various ways according to fancy, both for use and pleasure; and those not accommodated with gardens may plant them in pots or boxes, to place in court-yards, windows or balconies, &c. and train the plants upon strings, as just above intimated.

Early Crops of the Dwarf Kinds by Artificial Heat.

To have Kidney-beans as early as possible, recourse is had to raising the dwarf kinds by aid of artificial heat, by two or three different methods, such as—By raising the plants in a hot-bed, an inch or two high, and then plant them out into a warm border—By raising and continuing the plants in a hot-bed to bear their crops—By aid of a hot-house.

1. By raising in a hot-bed for transplantation into warm borders.—By this method we may forward Kidney-beans a fortnight earlier than those raised entirely in the full-ground: for this purpose, towards the latter end of March, or early in April, prepare a moderate hot-bed, a foot and half or two feet depth of dung, covered either with a frame or hand-glasses, or arched over with hoops or rods, to be covered with mats; earthing the bed with fine, light, rich mould, six inches deep; then having some seed of the early dwarf sorts, sow them pretty close for transplantation, either all over the surface, an inch or two apart, covering them with earth about half an inch deep, or in small close drills, earthing them over the same depth, or where only a few are wanted, they may be sown in large pots, at about an inch distance and half a one deep, and the pots plunged into any hot-bed, or placed in a hot-house; and when the plants come up, the pots may be removed by degrees into the full air in warm days, to harden the plants for transplantation. But it is a good method to plant a quantity of beans in small pots (thirty-twos, or forty-eights), three in each pot, plunging the pots in a hot-bed; and when the plants are fit for transplantation, they can be readily turned out of the pots with the whole ball of earth about their roots, so as not to feel their removal.

However, in raising the plants in either of these methods for transplantation in the full ground, your attention is particularly necessary to inure them gradually to the full air, by taking off the covers of glasses or mats in all mild weather, from those in hot-beds, and only cover them in cold nights; or pots in a hot-house, placed abroad in fine days, but as they advance in growth, and the weather be-

comes warmer, they must be exposed, by degrees to the full air, day and night, to harden them properly, previously to their final transplantation. Observing also to allow them frequent moderate refreshments of water.

When they have shot out their proper leaves an inch or two broad; and all danger of frosty mornings and other bad weather is apparently over, proceed to plant them out into a warm border, under a wall or other fence; observing, for this purpose, to take them up with their roots as entire as possible, and with as much earth as will hang about them, or with a small ball of earth; and those raised in small pots by threes may also be easily turned out with the whole ball of earth entire; and as to the mode of planting them, those which could not readily be taken up with balls, may be planted by dibble, in a row along close under a south wall, or some in cross rows two feet asunder, forming shallow drills for their reception, in which set the plants three or four inches apart; but those with good balls about their roots should be holed in with a trowel; and if some of those for a small early production are also disposed in patches, three plants in each, so as to be covered occasionally in cold nights with hand-glasses, it will be found very beneficial in forwarding their growth. As soon as they are planted, in either method, give a moderate watering to settle the earth close about the roots, and let it be repeated in dry weather as there may be occasion, till the plants have taken fresh root in their new quarters.

After this, keep them clean from weeds, and when a little advanced in growth, draw some earth lightly up about their stems; and as the warm season advances, if it proves hot and dry, refreshments of water will greatly forward and strengthen the growth of the plants.

Thus this crop of Kidney beans will sometimes arrive to a bearing-state a fortnight sooner than those raised entirely in the natural ground.

2. By hot-beds entirely.—To have Kidney-beans as early as possible, is effected by raising the small early dwarfs in hot-beds, and continuing them there to attain perfection, whereby they may be forwarded to a bearing state in April and May: the method is this: proceed, about the beginning or towards the middle of February, to make a dung hot-bed, either a small bed in which to sow the beans thick for transplanting when the plants are raised about an inch high, into a larger hot-bed, to remain for bearing; or make a larger hot-bed at once, in which to sow the
feed

seed and continue the plants to attain perfection, making the bed for one, two, or more three-light frames, about two feet and a half high in dung: and when the great heat and steam are a little abated, earth the bed with light, rich, dry mould, six or eight inches thick, for the reception of the seed (see HOT-BEDS); then having some seed of the small early dwarf kinds, draw drills from the back to the front of the bed, near an inch deep, and about fifteen or eighteen inches asunder; here place the beans two or three inches apart, and cover them evenly with the earth the above depth; then put on the lights: but tilt them behind an inch or two high daily, to give vent to the steam; and when the plants appear, continue every day to admit air to them at all opportunities, in proportion to the temperature of the weather, and heat of the bed, to prevent their drawing weak, and to promote their strength as they rise in height; bestow also at this time moderate refreshments of water in sunny days; and when they are two or three inches high, apply a little earth to their flanks; likewise support a moderate heat in the bed during the cold weather, by occasional linings of hot dung: observing, according as the plants advance in growth, and the warm season increases, to augment gradually the portion of fresh air daily to harden them by degrees, so as almost to be fully exposed occasionally in very warm days, especially when beginning to blossom; but keep them close on nights: continue also the care of frequent light waterings, which must be increased in quantity as the plants advance in size, particularly when they are in blossom, and in a fruiting state: in their advanced growth, if they press much against the glasses of the frame, it is proper to raise it at bottom two or three inches, to give room at top for their free growth; which being necessary to promote a plentiful bloom, for furnishing a proper crop of beans equal to the expense and trouble requisite in the culture of such early crops.

They will thus arrive to full growth, and produce early young Beans for the table in April and May.

But to obtain a constant succession of early Kidney-beans till the natural-ground crops come in, we should proceed with another crop in hot-beds, as above, in three weeks after the first hot-bed is made.

In default of frames for the above purposes, you may in March effect it with occasional coverings of mats; that is, make a hot-bed about two feet high of dung, earthing it directly six or seven inches thick, and sow the beans as before directed; then arch the bed

over with hoops, &c. and cover every night, and all bad weather, with mats: but admit the free air every mild day, gradually hardening the plants as they acquire strength; and give occasional watering: thus they will furnish beans in May.

3. By aid of a hot-house.—If you are accommodated with a hot-house or stove, early Kidney-beans may be obtained with very little trouble at almost any time in winter or spring: raising them in pots, or long narrow trough-like boxes, about two or three feet long and eight or ten inches broad at top; placing them any where in the lower part of the hot-house, the plants will succeed; observing as below.

The proper kinds for this purpose are the early white, yellow, and dun-coloured dwarfs, the latter rather a preferable bearer in long production; and the speckled dwarf also succeeds very well, and continues long in bearing.

Therefore any time in winter or early in spring, you may fill some large pots (sixteens or twenty-fours) or boxes with light rich earth, and place them in the hot-house, some arranged upon the top of the surrounding wall of the bark-bed, and on the top of the front flues towards the upright glasses, and in other similar convenient situations in this department, as room may admit; and in each pot plant four beans, near an inch deep; or, if boxes, plant the beans along the middle, in a sort of double row, triangular-ways, about four inches asunder, and the above depth: they will soon germinate, and in a few days appear above ground: when they, however, begin to sprout, it is proper to moisten the mould with a little water, which will facilitate the eruption of the plants out of the earth.

Their culture here is very easy: when they are come up, give frequent waterings, which will be requisite three times a week, at least, in this department, as the earth will dry very fast; but always keep it moderately moist, and the plants will blossom freely, and produce a plentiful crop of beans, often in as great perfection as in the full-ground crops.

They should be gathered often; which is the way to continue the plants long in bearing.

A regular succession of early young Kidney-beans may be obtained in this repository two or three months, by repeated sowings at about three weeks' interval, so as to have young plants advancing in pots or boxes in two or three different degrees of growth succeeding one another.

But

But as sometimes we are straitened for stove-room, it may be proper to plant the beans for succession crops in small pots (forty-eights) three beans in each, and as these will take up but little room, they may be sowed any where close together, or between the other larger pots; the plants will come up and be advancing in growth, so as when those of the preceding crops are going off, these may be readily turned out of the small pots with the whole ball of earth about their roots, and replanted into large pots, &c. to remain for fruiting, giving water at planting, and frequently afterwards, as above, in the first crop.

By this practice you will gain a month's growth in the plants, and you may thereby have a constant succession of beans for the table.

Saving Seeds of all the Sorts.

With respect to saving seed of Kidney-beans, all the sorts ripen plenty in August and September.

To have perfectly good seed, it would be proper to sow a sufficient quantity in rows on purpose, suffering the whole crop of the plants to remain without gathering any for use: you will thus have the seed ripen betimes, and in the highest perfection, which is essentially necessary for those who design the seed for public supply.

In private gardens, however, and many others, they often, after having gathered the prime as it were of the principal crops, leave the latter produce of them to grow for seed; which, although it may be tolerably good, is not always so large, plump, and fine, as in the former method.

When the seed is quite ripe, which is easily known by examining a few of the pods, pull up the plants, and spread them loosely along in rows, or upon any low hedges, &c. turning them occasionally that the beans may dry and harden well; which when effected, either thresh them out directly, or lay them up in some dry loft or other room till convenient; and when threshed out, and cleared from the rubbish, spread them upon some clean airy floor, or some such place in the dry, to harden perfectly; then put them up in bags for next year's use.

It is of much importance to have change of seed once in two or three years; that is, if you always save your own, it is advisable either to change a quantity of seed with some friend at a distance, or purchase a fresh supply once in the above-mentioned time; for by saving seed always in the same ground, it will degenerate, and the plants will in some

degree become deficient in bearing. But by change of seed from some distant place, as above, you will have the different sorts always in their ultimate perfection.

PHILADELPHUS, *Syringa*, or Mock-Orange.

Two hardy, deciduous, flowering shrubs are the principal species in this genus, furnishing some varieties; all noted floriferous plants for the shrubbery, rising several feet high, branching out into bushy heads, decorated with large oval leaves, and numerous clusters of tetrapetalous white flowers.

Class and order, *Icosandria Monogynia*.

Characters.] **CALYX** is monophyllous, acutely four-parted, and persistent. **COROLLA**, four large, roundish, plane, spreading petals. **STAMINA**, twenty or more awl-shaped filaments, having erect four-furrowed antheræ. **PISTILLUM**, a germen under the corolla, slender four-parted style, crowned by simple stigmas. **PERICARPIUM**, an oval-acute-pointed, quadrivalved, quadrilocular capsule, containing numerous small oblong seeds.

There are two noted species, both hardy deciduous shrubs, originally of foreign growth; but one of which has been long a resident of our gardens, is a very noted ornamental flowering shrub, comprising some varieties.

The species are,

1. **PHILADELPHUS coronarius**.

Common fragrant Syringa, or Mock-Orange.] Rises with many shrubby, slender, brown stems, of a brittle and pithy nature, branching five or six feet high, the branches by opposite pairs, alternately of contrary directions, jointed, and covered with a brown smooth bark; large oval-spear-shaped, rough, slightly-indented, opposite leaves; and at the axillas and termination of the branches many large loose bunches of white, very fragrant flowers; appearing in May and June.

The flowers, both in figure, colour, and scent, resemble those of the orange-tree: hence the appellation, Mock-orange.

Varieties] Dwarf fragrant *Syringa*—double-flowered dwarf. Both these varieties grow only about two or three feet high, garnished with small leaves, and the flowers generally rise singly.

2. **PHILADELPHUS inodorus**.

Scentless Carolina Syringa.] Rises with a shrubby stem, branching twelve or fourteen feet high; oval spear-shaped, entire leaves; and the branches terminated by large, white, scentless flowers.

Both these species of *Philadelphus* are elegant furniture for the shrubbery compartments:

ments: the first sort, however, and varieties, are the principal kinds at present in our gardens, the second sort being more rare in this country; but both the species are equally hardy, and will succeed in almost any soil and situation, and produce a profusion of flowers annually, particularly the *Coronarius Syringa*, which is in a manner covered with bloom, and exhibits a very ornamental appearance for a month or six-weeks, and emits an odoriferous scent widely around.

3. *PHILADELPHUS aromaticus*.

Aromatic Broad-leaved Philadelphus, or New-Zealand Tea.

4. *PHILADELPHUS rubricaulis*.

Ruddy-stalked, Shining-leaved Philadelphus. Their Propagation, &c.

The propagation of all the sorts is remarkably easy—by suckers—layers—and cuttings.

By Suckers.—All the sorts send out numerous suckers from the root, which may be separated from the parent plant, any time in open weather from October till March, and planted in nursery-rows, to remain one, two or more years to obtain strength, and then may be transplanted into the shrubbery.

By Layers.—Any time from October till March lay a quantity of the young branches; they will be rooted and fit for transplantation in autumn following, managing them as directed above for the suckers.

By Cuttings.—In October or November or spring, plant a quantity of the young shoots in any shady border; many of them will form proper plants in one year.

PHILLYREA, Mock-privet.

This genus consists of beautiful ever-green shrubs for adorning the shrubbery-compartments; rising from about six or eight to twelve or fourteen feet high, branching numerously and diffusely into bushy heads; closely garnished with oval, small, and moderate-sized leaves, and clusters of small monopetalous, funnel shaped, greenish-white flowers.

Class and order, *Diandria Monogynia*.

Characters.] *CALYX* is monophyllous, four-parted at top, and permanent. *COROLLA* is monopetalous and funnel-shaped, with a short tube below, and the limb or upper part divided into five revolute segments. *STAMINA*, two short filaments with simple erect antheræ. *PISTILLUM*, a roundish germen, slender style, and a thickish stigma. *PERICARPIMUM*, a globose unilocular berry, having one large globular seed.

There are but three species, all of which are hardy ever-greens of the shrub kind; but the *Phillyrea*, and a species of *Rhamnus* called *Alaternus*, are often mistaken for each other,

on account of the great similarity in their general port or habit; there is, however, this very obvious distinction; the leaves of the *Phillyrea* always grow opposite by pairs; those of the *Alaternus* stand singly in alternate arrangement; besides there is a classic difference in their fructification; the former having only two filaments, and the latter five; so that one is of the class *Diandria*, the other *Pentandria*. See *RHAMNUS Alaternus*.

The species of *Phillyrea* are,

1. *PHILLYREA media*.

Middle Phillyrea, or oval-leaved Mock-Privet.] Hath a shrubby upright stem, branching diffusely ten or twelve feet high; oval-lanceolate, almost entire, smooth, opposite leaves; and at the axillas of the branches clusters of small greenish-white flowers.

Varieties.] Privet leaved—olive-leaved.

2. *PHILLYREA latifolia*.

Broad-leaved True Phillyrea.] Hath a strong, shrubby, upright stem, branching erectly about twelve or fourteen feet high; oval-cordated, sharply-ferrated, opposite leaves; and at the axillas clusters of small greenish-white flowers.

Varieties.] Prickly ilex-leaved—slightly-ferrated leaved—box-leaved—bay-leaved.

3. *PHILLYREA angustifolia*.

Narrow-leaved Phillyrea.] Hath a shrubby stem, branching moderately about eight or ten feet high; long, narrow, spear-shaped, very entire, opposite leaves; and at the axillas of the branches clusters of small whitish flowers.

Varieties.] Rosemary-leaved—lavender-leaved—striped-leaved.

All these three species and respective varieties flower annually in March; the flowers are universally monopetalous, small, and greenish, so make no show; and, in all the sorts, are succeeded by small round berries, ripening in autumn to a black colour, each containing one seed. See the *Characters*.

They are all delightful ever-green shrubs, of a free easy growth, with long slender branches covered with a brownish or greyish bark, and closely garnished with their beautiful foliage the year round; which are generally of a thick, stiff consistence, with a smooth glossy surface, appearing very ornamental at all seasons: so that the shrubs are finely adapted to all the shrubbery compartments in assemblage with other ever-greens: they also appear well when detached here and there as single objects; and they formerly were often planted for internal hedges, to divide the quarters of wilderness-works, &c. in which they have a beautiful effect: they

are also well calculated for planting to cover any naked wall, &c. especially the boundary walls of fore-courts or other principal parts; in which they may be intermixed with *Alaternus* for variety, training their branches close to the wall, and they will soon spread and cover it effectually; when they may either be suffered to branch according to nature, or may be trimmed close every year in spring and summer, which is the most eligible method.

No good shrubbery, however, should be without a collection of these fine ever-greens: they may be obtained at most of the public nurseries, of two or three, to four or five feet growth, and the season for planting them is autumn and spring: should be disposed in the most conspicuous points of view, there suffered to branch in their own rural manner, only just regulating with your knife any very straggling and disorderly branches.

Their Propagation.

The propagation of all the three species of this genus is by seed and by layers.

By Seed.—This should generally be sown in autumn, soon after it is ripe, and probably it will come up the spring following; though for the most part, the seed of all these plants remain until the second spring before they germinate; chuse, however, a light sandy soil for the reception of the seed, which sow evenly, either all over the surface, covering it with earth an inch deep, or in shallow flat drills about the same depth: keep the beds very clean from weeds, both before and after the appearance of the seedlings: giving also frequent waterings in dry weather. Observing, it is proper to let them have two years' growth in the seed-bed: remark, however, at the approach of winter, it will be proper to arch the bed over with hoops, or rods, in order to shelter the seedlings with mats in time of severe frost; for they are tender whilst young; but after the second summer's growth they become tolerably hardy, and may then be bedded out either in autumn following, or in the ensuing spring, February or March, when the weather is settled, planting them in beds or nursery-rows to remain two or three years, or more, to acquire due size for the shrubbery.

By Layers.—Autumn is the best season, though it may also be performed in winter and spring; chusing the young shoots, which lay either by slit-laying, or by twisting at a joint, and they will be rooted by autumn following; when they may be separated from the parent plant, and planted in nursery-lines, to remain till fit for the shrubbery plantations.

PHLOMIS, Jerusalem Sage, and *Leonurus*.

This genus furnishes some eminent shrubby and under-shrubby ever-greens, for the pleasure-ground and green-house collection; all of which are of upright growth, garnished mostly with simple entire leaves, in some sorts assuming a beautiful hoary whiteness, and monopetalous, ringent, very ornamental flowers.

Class and order, *Didynamia Gymnospermia*.

Characters.] CALYX is monophyllous, tubular, oblong, five-angled, and permanent. COROLLA is monopetalous, with an oblong tube, ringent above, having the upper lip oval, arched, and reflexed; and the under three-parted, the middle part large and obtuse. STAMINA, two long and two short filaments, and oblong antheræ. PISTILLUM, a quadripartite germen, a style the length of the stamina, and a bifid acute stigma. PERICARPIUM, none; four naked seeds lodged in the permanent calyx.

There are many species, but not more than four common to the English gardens; all of which are of a shrubby nature, two of them hardy for the shrubbery, and two for the green-house.

Hardy Kinds for the Shrubbery.

These sorts are ever-greens, and are remarkable in having their branches and leaves of a hoary white colour, in which they exhibit a singular variety.

1. PHLOMIS *fruticosa*.

Shrubby Yellow Phlomis, commonly called Jerusalem Sage.] Hath a shrubby thick stem, branching irregularly four or five feet high, the stem and older branches having a loose ragged bark, and the young branches four-cornered and woolly; roundish-oblong, crenated, hoary-whitish leaves, by opposite pairs on woolly foot-stalks; and from the upper parts of the young shoots, large whorled bunches of yellow flowers. In June, July, and August.

Varieties.] Common broad-leaved—narrow-leaved—dwarf Cretan sage-shrub.

2. PHLOMIS *purpurea*.

Purple Portugal Phlomis.] Hath an under-shrubby stem, branching four feet high, having slender, angular, white branches; oblong, cordated, hoary leaves; and from the joints of the branches whorls of deep-purple flowers, in June and July.

Both these species prosper in the open ground, and as they retain their hoary-white leaves all the year, are highly ornamental in shrubberies; they, however, were formerly kept

kept in pots, and treated as green-house plants; but this is unnecessary unless for variety, for they will succeed in any of the shrubbery compartments the year round; though the *Phlomis purpurea* being rather of a more tender nature, some may be potted and managed as green-house plants.

Green-house Kinds.

These sorts were formerly of the genus *Leonurus*; but modern botanists have ranged them as species of *Phlomis*.

3. *PHLOMIS Leonurus*.

(*Leonurus*)—or *Lion's-Tail*, commonly called *African Scarlet Leonurus*.] Rises with a shrubby branching stem, seven or eight feet high, having four-cornered branches; spear-shaped, serrated, opposite leaves; and towards the ends of the branches, whorls of close-sitting scarlet flowers, having ten-angled cups indented into ten parts; flowering in October and November.

Variety.] With variegated leaves.

4. *PHLOMIS nepetifolia*.

Nepeta-leaved Cape Leonurus.] Rises with a shrubby branching stem, a yard high, having four-cornered branches; oval leaves, opposite by pairs; and whorls of scarlet flowers, having ten-angled cups, indented into seven equal parts; flowering in October and November.

All these four species of *Phlomis* have great merit as ornamental plants, both as evergreens, and for the beauty of their flowers, as they all flower very ornamentally every year in our gardens; those of the *Leonurus* kinds in particular make a fine appearance; but the flowers of all the sorts are numerous, and being collected into large verticilli towards the ends of the branches, are very conspicuous; they are universally monopetalous, ringent, and hermaphrodite. See the *Characters*.

The two hardy kinds are choice ornaments for the shrubbery, their hoary branches and leaves will exhibit a delightful contrasted variety in assemblage with other different evergreens; suffering them to branch in their own way.

The two green-house kinds highly merit culture for the beauty of their flowers in particular; they must be potted in rich earth, and managed as other shrubby exotics of the green-house collection.

Their Propagation.

The propagation of all the sorts is by layers and cuttings.

By Layers.—The two hardy sorts in particular grow freely by layers: chuse the young branches, and lay them in the common way any time in autumn, spring, or summer, they

will readily strike root, and commence proper plants by autumn after, when they should be transplanted.

By Cuttings.—Plant a quantity of young shoots in spring and summer, in a shady border; give plenty of water in dry weather; many of them will root and make good plants, by the next autumn.

Remark, however, the cuttings of the green-house kinds should, if in spring, be planted in pots, in order to be continued in shelter until May; or if the pots are plunged in a hot-bed, it will greatly forward their rooting: though young shoots planted in June or July in a bed or border of rich earth, many of them will take root, but may be much forwarded if covered down close with hand-glasses, removing the glasses when the cuttings begin to shoot.

PHLOX, Lychnidea, or Bastard-Lychnis.

The plants of this genus are herbaceous, fibrous-rooted, flowery perennials for adorning the pleasure-garden; rising with upright annual stalks, from one to two or three feet high, garnished with spear-shaped and oval leaves, and terminated by clusters of monopetalous, hypocrateriform, reddish, purple and white flowers, ornamental.

Class and order, *Pentandria Monogynia*.

Characters.] *CALYX* is monophyllous, quinque-dent, and permanent. *COROLLA* is monopetalous, and hypocrateriform, with a cylindric crooked tube, and a plane limb, divided into five obtuse segments. *STAMINA*, five filaments within the tube, and antheræ placed in the chaps of the corolla. *PISTILLUM*, a conical slender style, and trifid acute stigma. *PERICARPIUM*, an oval, trigonal, trivalvular, trilocular capsule, having one oval seed in each cell.

There are about nine or ten species, the most material of which for our purpose are the following seven sorts.

1. *PHLOX glaberrima*.

Smooth Virginia Lychnidea.] Hath creeping perennial roots; upright, herbaceous, smooth stems, near two feet high; narrow, spear-shaped, smooth, opposite leaves; and the stalks terminated by corymbous clusters of reddish flowers. Appearing in June or July.

2. *PHLOX caroliniana*.

Carolina shining-leaved Lychnidea.] Hath a strong, creeping, perennial root; upright rough stems, two feet high; spear-shaped, stiff, shining, sessile leaves, by pairs opposite; and the stalks terminated by a flat corymbus of deep purple flowers. Appearing in July.

3. *PHLOX paniculata.*

Paniculated American Phlox, or Lychnidea.]

Hath perennial roots; upright, herbaceous, branchy stems, two or three feet high; spear-shaped, rough-bordered, close-fitting, opposite leaves; and the stalks terminated by a paniculated corymbus of pale-purple flowers. Appearing in July and August.

4. *PHLOX divaricata.*

Divaricated Blue Virginia Phlox, or Lychnidea.]

Hath perennial roots; herbaceous, slender, weak, divided stems, having the branches divaricated, or spreading from each other; broad, spear-shaped, sessile leaves, the upper ones placed alternately; and pedunculi by pairs, supporting loose bunches of light-blue flowers. Appearing in May and June.

5. *PHLOX maculata.*

Maculated or Spotted-stalked Virginia Phlox.]

Hath a perennial root; upright, cylindric, rough, purplish, white, and red-spotted stems, a yard high, branching by opposite pairs; spear-shaped, smooth, amplexicaule, opposite leaves; and the branches terminated by a corymbus of bright-purple flowers. Appearing in July and August.

6. *PHLOX pilosa.*

Hairy Virginia Phlox.]

Hath a perennial root; upright, single, slender stalks, about a foot high; spear-shaped, acute, hairy, sessile leaves; and the stalks terminated by a corymbus of light-purple flowers. Appearing in June and July.

7. *PHLOX suaveolens.*

Sweet-smelling White-flowered Phlox.]

Hath a perennial root, upright, taper, whitish stems, about two feet high; oval lanceolate leaves, smooth on both sides, and the stalks terminated by a corymbus of snow-white, sweet-scented flowers. Appearing in July and August.

All these seven species of *Phlox* are hardy perennials, originally from North America; durable in root, but renew their stalks annually. Considered as flowery plants, they merit culture in every good garden, for they flower very ornamentally: the flowers are all monopetalous, salver-shaped, and collected into large conspicuous bunches at top, continuing three or four weeks in beauty, but are rarely succeeded by ripe seeds in England.

They will prosper in any of the compartments of the pleasure-garden, but are particularly well adapted for embellishing the principal borders, &c.

Most of the sorts may be had at the public nurseries; and the proper season for removing them is in autumn when their stalks de-

cay, or early in spring before they begin to shoot.

Propagation of all the Sorts.

The propagation of all the sorts is by parting the roots, and by cuttings of their young stalks.

By parting their Roots.—Autumn, when their stalks decay, is the best season for this. Most of the sorts afford a sufficiency of off-sets for propagation, which are to be separated in the usual way, not too small; planting the strongest slips where they are to remain to flower, and the smaller in nursery-rows for a year, to get strength.

By Cuttings.—If any sorts furnish but a sparing supply of off-sets from the roots, recourse may be had to cuttings of the young stalks: May, or June, when the shoots are but a few inches high, is the proper season; cut off a quantity close to the ground, and trim off their tops; then plant them in a bed or border of good earth, or in large pots, several in each; giving water directly, repeating it often in dry weather, with occasional shade from the sun till rooted; or, if they are planted close, and covered with hand-glasses, it will forward their rooting; removing the glasses when they begin to shoot.

PHOENIX, Great Palm, or Date-tree.

It consists of one species only, an evergreen tree of great height and singularity, an exotic of Africa and India, and retained here in our stoves for variety.

Class and order, Diœcia Triandria.

Characters.]

CALYX, male and female spadicous flowers on different plants, having an univalvular general spatha, protruding a branching spadix, composed of many florets, each with a three-parted perianthium. COROLLA, three oblong concave petals in the males, and in the females is composed of six parts. STAMINA, three very short filaments, and oblong linear antheræ. PISTILLUM, a roundish germen, awl-shaped style, and acute stigma. PERICARPium, an oval, baccaceous, unilocular fruit, containing one nearly oval, very hard seed.

The species is:

PHOENIX dactylifera.

Date-bearing Greater Palm, or Indian Date-tree.]

Rises with an upright, straight, undivided, branchless trunk, from fifty to an hundred feet high, studded with rugged protuberances, the vestiges of fallen leaves, and the middle filled with pith; no proper branches, but crowded at top with a vast, columnar, spreading cluster of pinnated branch-like leaves, six or eight feet long, composed of long, sword-shaped, complicated, stiff, alternate folioles; and

and amidst the leaves very long spadiceous clusters of whitish flowers, succeeded in the female plants by clusters of large oval berries.

Varieties.] Male Date-tree, producing male flowers only — female Date-tree, producing female flowers and fruit.

The berries of this tree are the dates of the shops, imported hither from Africa and the countries in the Levant.

This singular tree, like the rest of the Palm tribe, has no other branches than its large leaves, each of which being a composition of a leaf and branch, always arising from the top, and as the old leaves fall, the stem forms itself and advances in height; but although the leaves grow very tall in a few years, yet the stem advances but slowly, and can never be expected to arrive at a flowering and fruiting state in this country; it, however, merits a place in our hot-house collections for its singularity.

It must always be kept in pots of rich earth, and placed constantly in the stove; and if there plunged in the bark-bed, it will make the greater progress: observing to give proper watering, and shift it occasionally into larger pots.

The propagation of this plant is by seed, procured from abroad, which sow as soon as possible, in pots of light rich earth, and plunge them in a tan hot-bed, or in the bark-bed in the stove; giving moderate waterings, they will soon come up, which, when a few inches high, prick into separate small pots, plunge them in the hot-bed, or in the bark-bed, as aforesaid; where they may remain, giving frequent waterings, and shift them into larger pots, according as their progress of growth may require.

PHYLICA, Bastard Alaternus.

This genus is composed of shrubby ever-green exotics of Africa, for the green-house collection; are of branchy growth, obtaining three or four feet stature, garnished with small ever-green leaves; and clusters of pentapetalous whitish flowers at the ends of the branches.

Class and order, *Pentandria Monogynia*.

Characters.] CALYX, many florets collected into a head, situated on one common receptacle, each having a monophyllous, five-parted, permanent cup. COROLLA, each floret is composed of five acuminate squamulae situated in the base of the divisions of the calyx. STAMINA, five small filaments under the squamulae, and simple antherae. PISTILLUM, a roundish, trilobed, trilocular, trivalvate capsule, having a roundish seed in each cell.

The most material species in the English gardens are the three following:

1. PHYLICA *ericoides*.

Heath-leaved Phylica.] Hath a low shrubby stem, divided into many spreading branches, forming a bushy head, about three feet high, closely garnished with very narrow, small, heath-like, close-fitting leaves, round the branches; and all the branches terminated by close clusters of white flowers; in autumn and winter.

2. PHYLICA *plumosa*.

Plumose-flowered Phylica.] Hath a low shrubby stem, divided and branching about a yard high; narrow awl-shaped leaves, hairy at top, placed alternately on every side of the branches; and the branches terminated by close downy heads of fringed white flowers; in autumn and winter.

3. PHYLICA *buxifolia*.

Box-leaved Phylica.] Hath a shrubby erect stem, branching four or five feet high; small oval, obtuse, firm, smooth, sparsely leaves, downy underneath; and the branches terminated by small heads of greenish flowers; in autumn and winter.

All these species are durable in root, stem, and branches, and retain their leaves all the year.

They being natives of *Æthiopia*, and other parts of Africa, are somewhat tender, requiring shelter here in winter, so must always be kept in pots, and placed among the green-house exotics, where they will effect a very agreeable variety at all seasons, and flower annually great part of autumn and winter; but do not produce seed in England.

Their propagation is chiefly effected by cuttings and slips of the young shoots.

In spring, about March or April, take off a quantity of young cuttings, or slips of the small shoots, plant them in pots of rich earth, which plunge in a hot-bed, or in the bark-bed in the stove; giving frequent waterings, and occasional shade from the sun, they will soon emit roots, and become proper plants fit for potting off separately in autumn.

Or young cuttings or slips planted any time in summer, particularly June and July, in pots as above, and placed under a hot-bed frame, or covered close with hand-glasses, watered and shaded, will also grow, but will not be so forward as those of the spring planting.

PHYLLANTHUS, Sea-side Laurel.

A genus furnishing some curious ever-green tree and shrub exotics, of America and Asia, for the stove collection, growing six or eight to ten or twelve feet high, ornamented with beautiful large, oval, lanceolate, and pinnated

nated floriferous leaves; and male and female flowers apart on the same plant, bell-shaped, six-parted, spreading, coloured cups; no petals; three stamina in the males, a roundish germen in the females; with three styles, succeeded by a roundish trilocular capsule, containing three roundish seeds.

Class and order, *Monœcia Triandria*.

The principal species are,

1. *PHYLLANTHUS grandifolius*.

Great-leaved American Phyllanthus, or Sea-side Laurel.] Rises with a tree-like stem and branches, garnished with large, ovate, obtuse, entire leaves.

2. *PHYLLANTHUS Emblica*.

Pinnated floriferous-leaved Indian Phyllanthus.] Rises with a tree-like stem; pinnated leaves, bearing flowers, and berry-like fruit.

3. *PHYLLANTHUS Epiphyllanthus*.

Lanceolate floriferous-leaved American Phyllanthus.] Shrubby, with large lanceolate, serrated, shining leaves, bearing flowers in serratures on the edges.

4. *PHYLLANTHUS Niruri*.

Herbaceous Upright Phyllanthus.] Rises with herbaceous, upright stems, pinnated leaves, flower-bearing, and flowers peduncled.

These different species effect a fine variety in their beautiful foliage, and the floriferous-leaved kinds have a singularly curious appearance; are all tender exotics, requiring a constant residence in the stove; and are propagated by seeds from abroad, sown as soon as obtained, in pots of light earth, plunged in a hot-bed, or the bark-bed in the hot-house, &c. also sometimes by layers, slips, and cuttings by the same assistance.

PHYLLIS, Bastard Hare's-Ear.

In this genus are retained some small, shrubby, ornamental ever-green exotics from Asia, for the green-house, growing with soft ligneous, jointed stems, two or three feet high, adorned with beautiful lanceolate and oblong shining leaves, and the branches terminated by small pentapetalous, reflexed, whitish-purple flowers in panicles; having small two-leaved cups, five spear-shaped, reflexed petals, five stamina, a turbinate germen, with two stigmas, succeeded by an oblong angular fruit, with two seeds. (*Pentandria Digynia*.)

The species in our gardens are,

1. *PHYLLIS Simpla nobla*.

(*Simpla nobla*)— or *Canary Bastard Hare's-Ear*.] With spear-shaped leaves, and indented stipulæ.

2. *PHYLLIS indica*.

Indian Bastard Hare's-Ear.] With oblong leaves, and entire stipulæ.

These two small ever-green exotics form an agreeable variety in the green-house collection: they must be planted in pots of light good earth, and managed as geraniums, and other similar green-house plants; they will flower in June and July, and ripen seed in autumn, by which, sown in the spring in a hot-bed, the plants may be propagated; also by cuttings in the same season, or in summer.

PHYSALIS, (Alkekengi) Winter Cherry.

This genus consists of herbaceous and shrubby ornamental plants, for the pleasure-ground, green-house, and stove, mostly of upright, branchy growth; garnished with oblong, oval, and heart-shaped leaves; and small, monopetalous, rotaceous, white and yellow flowers.

Class and order, *Pentandria Monogynia*.

Characters.] *CALYX* is small, monophyllous, pentagonous, semi-quinquefid, swelling, and persistent. *COROLLA* is monopetalous and rotated, with a very short tube, and the limb large, plicated, and quinquefid. *STAMINA*, five small, awl-shaped filaments, having erect connivent antheræ. *PISTILLUM*, a roundish germen, filiform style, and obtuse stigma. *PERICARPIUM*, a small, roundish, bilocular berry, lodged in a large, swollen, pentagonous, coloured calyx, having many reniform seeds.

There are about eight or ten species in this genus, consisting of hardy herbaceous perennials and annuals for adorning the pleasure-garden, and shrubby plants for the green-house and stove collections.

Hardy Herbaceous Perennial Kinds.

Of these kinds there are only two species for our purpose, both exotics of foreign countries, but hardy enough to live here in the open ground; one of which, *Common Winter Cherry*, hath been long a resident in our gardens.

1. *PHYSALIS Alkekengi*.

(*Alkekengi*) *Common Winter Cherry*.] Hath long, creeping, perennial roots; many upright, jointed, herbaceous stems, a foot and a half high, branching at bottom; garnished with large, oblong, acute, entire leaves, by pairs from the same side of the stalk; and at the axillas, long slender pedunculi, terminated by white flowers, succeeded by round red berries, inclosed in the large inflated bladder-like calyx.

2. *PHYSALIS viscosa*.

Viscous-berried Virginia Winter Cherry.] Hath a creeping perennial root; many upright herbaceous stems, about a foot high, paniculated above; obtuse, repand, downy leaves by pairs; and at the axillas yellowish flowers, suc-

succeeded by greenish-yellow viscous berries.

Both the above species flower in June or July, and the berries ripen in autumn; those of the first sort resemble common red cherries, and exhibit a very ornamental appearance in autumn.

The berries of the first sort (*Alkekengi*) are used with success against the gravel and stone, and the heat of urine; and may be eaten raw, or boiled in milk, and sweetened with sugar.

Annual Kinds.

There are two species of the annual kind proper for our collection, both exotics, but hardy enough to prosper in the open borders.

3. *PHYSALIS angulata*.

Angular Winter Cherry.] Rises with an upright firm stem, divided into numerous angular smooth branches, growing two or three feet high; oval indented leaves; and at the axillas and ends of the branches small white flowers, succeeded by large yellowish berries.

Varieties.] There are many varieties differing in some respect or other, but all retain the specific difference of having angular branches, and smooth oval leaves.

4. *PHYSALIS pubescens*.

Downy Winter Cherry.] Rises with a short stem, dividing low into numerous spreading branches, oblong, downy, viscous leaves; and at the axillas greenish-yellow pendulous flowers; succeeded by large yellowish berries.

Varieties.] There are many varieties differing from one another in some peculiar mode of growth.

Both these species and respective varieties flower in June and July, and the berries ripen in autumn.

Shrubby Green-house Kinds.

Of these kinds there are but two species common to the English gardens, both of which are of a shrubby nature; and being exotics of warm countries, require shelter of a green-house here in winter.

5. *PHYSALIS somnifera*.

Somniferous Sicilian Winter Cherry.] Hath a shrubby stem, branching three or four feet high, with the branches erect; oval, spear-shaped, downy, entire leaves; and at the axillas greenish-white flowers in clusters, succeeded by small red berries.

6. *PHYSALIS flexuosa*.

Flexuose Indian Winter Cherry.] Hath a shrubby stem, branching four or five feet high, with long flexuose branches; oblong,

almost close-fitting leaves; and at the axillas clusters of small greenish-yellow flowers, succeeded by purplish berries.

Both these plants flower in June and July; and in favourable, warm, dry seasons, the berries ripen in autumn.

Shrubby Hot-house Kinds.

There are two species for the stove, both of them shrubby; and being natives of the hot parts of India, &c. require the constant aid of a stove to preserve them in this country.

7. *PHYSALIS arborescens*.

Tree-like Campeachy Physalis.] Hath a woody upright stem, dividing and branching out at top ten or twelve feet high; oval hairy leaves, alternate below, and opposite above; and at the axillas, almost solitary, yellowish, revolute flowers; succeeded by small red berries, in dark purple bladders.

8. *PHYSALIS curassavica*.

Winter Cherry of Curassao.] Hath an under-shrubby branching stem, rising two or three feet high; oval, downy, alternate leaves; and at the axillas small, close-fitting, yellow flowers, rarely succeeded by berries in England.

The above eight species of *Physalis* are the chief sorts at present in our gardens; they flower principally in June, July, and August; the flowers are small, and consist each of one rotated, or wheel-shaped, quinquefid petal; which in most of the species are succeeded by ripe berries inclosed in the calyx, forming an inflated, or bladdery-like, coloured cover, opening at top, and discovering the fruit, and appears very beautiful in the autumn season.

All the sorts are retained in curious gardens as plants of ornament.

The herbaceous species, both of the perennial and annual kinds, succeed in the open ground; the former all the year, and the latter in summer, and make a pretty appearance, especially in autumn, with their beautiful cherry-like red berries: observing, however, that as the second sort, *Physalis viscosa*, is rather of a tender nature, some plants should also be kept in pots, to move to occasional shelter of a garden-frame, &c. in frosty weather.

The shrubby kinds, both of the green-house and hot-house, must always be kept in pots for moving to shelter of these conservatories, and managed as other shrubby exotics of each collection.

The Propagation of all the Sorts.

The propagation of all the sorts is easily effected by seed; and the herbaceous perennials likewise by parting the roots; and the shrubby kinds of the green-house and stove also

also by cuttings; see each sort under a separate head as follows:

Herbaceous Perennial Kinds.—These sorts may be multiplied abundantly by seed, and by parting the roots. 1. **By Seed.**—Sow it in autumn as soon as ripe, or in spring, in a bed or border of light, dry soil, covering them half an inch deep; and when the plants are come up about two or three inches high, prick them out in nursery-rows to stand till autumn, then transplant them where they are to remain. 2. **By parting the Roots.**—They multiply plentifully by the root, which may be parted any time in open weather from October till March; every slip having fibres at bottom, and a bud at top, will form a good plant.

Annual Kinds.—Both these sorts are raised from seed annually in spring, in April, either in a warm border, or in a hot-bed, to bring them more forward into flower: sow the seed about a quarter of an inch deep; and when the plants are come up about three inches high, prick them out, which if also in a hot-bed for a month, it will forward them greatly; hardening them gradually to the open air, then transplant them in moist weather, with balls, into the borders, pots, or places where they are to flower.

Green-house Kinds.—They are best propagated by seeds in a hot-bed in spring; and when the plants are a few inches high, prick them out into separate small pots, giving water and occasional shade: afterwards manage them as other shrubby exotics of the green-house.

Cuttings of these sorts may also be struck by aid of the hot-bed, in spring or summer.

Hot-house Kinds.—They may be raised both from seed sown in pots, and plunged in a hot-bed; and by cuttings in spring or summer, planted in pots and plunged in any good hot-bed, or in the bark-bed of the stove, &c.

PHYTOLACCA, American Nightshade.

It furnishes principally herbaceous plants, one or two of which, hardy perennials, are retained as ornamental plants for the pleasure-garden; rising several feet high, adorned with large oblong and oval entire leaves; and clusters of pentapetalous flowers.

Class and order, *Decandria Decagynia*.

Characters.] CALYX, none. COROLLA, five roundish, concave, spreading, coloured, permanent, reflexed petals. STAMINA, ten, or sometimes less or more filaments, in different species, and roundish antheræ. PISTILLUM, an orbicular depressed germen, divided on the outside, and terminated by ten very

short patent, reflexed styles, having simple permanent stigmas. PERICARPIUM, an orbicular, depressed, ten-furrowed, decemlocular berry, having a single kidney-shaped seed in each cell.

There are four species, three herbaceous, and one shrubby; the most material of which are the two following herbaceous perennials.

1. *PHYTOLACCA decandria*.

Decandrous Virginia Phytolacca, or Common American Nightshade.] Hath a very thick, fleshy, divided, deeply-penetrating root; upright, strong, herbaceous stems, dividing and branching six or seven feet high, covered with a purplish bark; garnished with large, oblong, entire leaves, placed irregularly; and at the joints and axillas of the stalks long pedunculi, sustaining each a large cluster of small decandrous and decagynous, purple flowers, succeeded by depressed ten-furrowed berries, ripening in autumn.

2. *PHYTOLACCA octandria*.

Octandrous Mexican Phytolacca.] Hath a fleshy root; upright, strong, herbaceous stem, dividing and branching two or three feet high; oval, spear-shaped, veined leaves, placed irregularly; and from the side of the branches long pedunculi, terminated by spikes of close-fitting, octandrous and octogynous, white flowers; succeeded by depressed, ten-furrowed berries, ripening in autumn.

Both these species flower in July and August: the flowers are numerous in each cluster and spike; each flower being composed of five permanent petals, &c. succeeded by berries (as described in the characters), furnishing plenty of ripe seed in favourable autumns.

The juice of the berries stains linen and paper of a fine purple colour, but is not lasting.

These plants are perennial in root, but annual in stalk, which rising in spring, decays at the approach of winter.

They may be employed as plants of ornament in any of the compartments of the pleasure garden, but principally in a dry situation, where they will abide in root many years, particularly the first sort, and shoot up new stalks every spring, and produce their flowers and fruit abundantly, and make a good appearance.

The first species, *Phytolacca decandria*, is the sort the most commonly known and cultivated.

The propagation of both the species is by seed, sown in spring, in any bed or border of light earth, in shallow drills half an inch deep; and when the plants are come up three or four inches

inches high, plant them out in moist weather, either in nursery-rows till autumn, or at once into the places where they are to remain.

PINUS, Pine-tree, including the fir-tree, &c.

This genus comprises a grand collection of noble ever-green trees, and one deciduous kind, obtaining great height and magnitude, and of high value and worth, both for their beautiful growth to embellish ornamental plantations, and for their great utility as timber-trees. All of them closely garnished with small, linear, acerose leaves; and monœcious, amentaceous, apetalous flowers, succeeded in the females by a scaly conic seed-vessel, called a cone.

Class and order, *Monœcia Monadelphica*.

Characters.] CALYX, male and female flowers, separate on the same plant, having scaly calyces; the males being collected into scaly bunches, and the females into an imbricated cone, composed of oblong, rigid, permanent scales, each containing two florets. COROLLA, no petals, each floret consisting only of the fructifications. STAMINA, many monadelphous filaments having erect antheræ. PISTILLUM, a very small germen, awl-shaped style, and simple stigma. PERICARPIUM, none: the seeds are lodged in the calycinal scaly cone; each seed is an oblong-oval nut, furnished with a membranaceous wing.

To this genus of *Pinus*, Linnæus has added *Abies*, the Fir-tree, *Cedrus* and *Larix*, the Cedar of Lebanon and Larch-tree; which former botanists considered as so many distinct genera; but their generic characters being the same in every respect as the *Pinus*, they are now all ranged as species only of that genus: all the species of which, except the *Larix*, are ever-greens, and rise to a vast height, some above an hundred feet, with perfectly straight stems; branching all around almost to the very bottom, mostly in circular tiers or courses, at distances one above another, spreading regularly like rays, in a somewhat horizontal position, shortening gradually towards the top, so as to give the head a conical form; and, being very closely garnished with linear, or very narrow acerose leaves, appear with a beautiful majestic grandeur; and are all so very hardy, that they prosper in almost any soil and situation, and are exceedingly well adapted both for ornamental and profitable plantations.

There are about ten or twelve distinct species: those commonly called Pine-trees are very distinguishable by sight from the Firs,

and both of these from the Cedar of Lebanon and Larch-tree. The leaves of the former (Pine-tree) come out by two, three, or five, from the same point and sheath: those of the Firs come out singly, and, in the Cedar of Lebanon and Larch, arise in bunches from the same point, those of each bunch spread out every way.

Pine Kinds; having two, three, or five Leaves in each Sheath.

There are several species of these kinds, with some varieties; all hardy ever-green trees.

1. PINUS *sylvestris*.

Wild Pine-tree, or Scotch Pine, most commonly called Scotch Fir.] Rises with an upright, perfectly straight stem, from about fifty to seventy feet high, or more, branching regularly all around; short, smooth, dark-green leaves, two in each sheath; but the primordial or first leaves come singly; and short pyramidal acute cones.

It grows wild in gravelly woods, in many of the northern parts of Europe, and in great plenty in the Highlands of Scotland: hence the name *Scotch Pine*, &c.

There are vast plantations of this valuable tree in most parts of Scotland, where they beautifully enrich gentlemen's estates, in which we may see them prosper in all exposures and soils, even on mountains and rocks, as well as in low moist ground; so may be cultivated to great advantage in any situation, and in places where many other trees, &c. would not thrive.

The timber of this tree is the common red or yellow deal, of great value for all kinds of buildings.

2. PINUS *pinaster*.

Pinaster, or Foreign Wild Pine.] Rises with an upright, straight stem, from fifty to sixty or seventy feet high, sending out large, horizontally spreading, yellowish branches, irregularly; very long, smooth leaves, two in each sheath, but the primordial ones singly; and very long, pyramidal, acute cones.

3. PINUS *pinca*.

Italian Stone Pine.] Rises with an upright, straight stem, fifty or sixty feet high, having a roughish bark; very long, sea-green leaves, two in each sheath, with the primordial ones singly and ciliated; and large, roundish, turbinated, close cones; having large eatable kernels.

It is a native of Italy and Spain, where the kernels of the cone are in much esteem for eating, and are very wholesome, and good for colds and consumptions.

4. PINUS *Strobus*.

Strobus

Strobus Pine-tree, commonly called Weymouth Pine.] Rises with an upright very straight stem, an hundred feet high, or more, branching widely around, having a very smooth bark; long, slender, dusky-green leaves, by fives in each sheath; and long, slender, loose cones.

It is a native of North America, and first cultivated here on Lord Weymouth's estate, hence the name, *Weymouth Pine*. It is a tree of admirable beauty; and the prodigious height and magnitude which it attains, renders it of great value for its timber, and makes the most excellent masts for ships.

5. *PINUS Tæda.*

Torch Pine, or Three-leaved Virginia Swamp Pine.] Rises with an upright stem to a great height; having long, slender leaves, by three in each sheath: and large, long, loose cones.

It grows naturally in low swampy grounds in Virginia and Canada.

6. *PINUS Cembra.*

(Cembra)—or Mountain Siberian Pine.] Rises with an upright straight stem, forty or fifty feet high; having long, slender, very smooth, light-green leaves, five in a sheath; and large close cones.

7. *PINUS palustris.*

Swamp Prickly-coned Carolina Pine.] Rises with an upright, straight stem, twenty to thirty feet high; very long, slender leaves, growing by threes in a sheath, at the ends of the branches, and subcylindrical prickly cones.

It grows naturally in low swampy grounds in Carolina and Georgia.

The above seven sorts are the principal species of the Pine kind; but there are several varieties that belong to one or other of them, and are distinguished in the nurseries by the following names and descriptions.

Frankincense three-leaved American Pine—Virginia cluster-coned Pine—Mugho two and three-leaved Mountain Pine—Jersey two-leaved prickly-coned Pine—Aleppo spreading-branched, two-leaved Pine—dwarf two-leaved American Pine.

Fir Kinds (Abies) having Solitary or Singly-placed Leaves.

There are about six species of these sorts, with some varieties; all hardy ever-green trees.

8. *PINUS Abies.*

(Abies)—or Common Fir-tree, commonly called Norway Spruce Fir.] Rises with an upright stem, to a great height, branchy to the bottom; solitary, narrow, awl-shaped, sharp-pointed, smooth, dark-green leaves, standing two ways; and large cones, six or eight inches long, hanging downward.

Varieties.] Red Norway spruce Fir—White Norway spruce Fir—Long-coned Cornish Fir, having longer leaves, and cones eight or ten inches long.

They grow naturally in Norway, and other northern parts of Europe, where they are commonly denominated Pitch-firs, because in those countries great quantities of pitch, &c. is extracted from them; their timber is the white deal, so greatly esteemed by the joiners.

9. *PINUS canadensis.*

Canada Spruce Fir.] Rises with an upright, straight stem, to a great height, branching from bottom to top; solitary, very narrow, shortish, obtuse-pointed, dark-green leaves; and small close cones an inch long.

Varieties.] Canada white spruce—red spruce—and black spruce Fir; differing from each other principally in the colour of the cones. These are all natives of North America.

10. *PINUS picea.*

Pitch-tree, commonly called Silver Fir.] Rises with an upright very straight stem, sixty or seventy feet high, or more, branching thinly, having a smooth bark; solitary flat leaves, emarginated at top, marked with two silvery white lines underneath; and has very long erect cones.

It grows naturally in the Alps, Germany, and in the Highlands of Scotland, and is remarkable for affording plenty of turpentine, &c.

11. *PINUS Balsamea.*

Balm of Gilead Fir.] Rises with an upright, straight stem, very branchy almost to the bottom; closely garnished with solitary, flat, obtuse leaves, slightly emarginated at the top, of a dark-green above, and marked with whitish lines underneath; and small roundish cones.

Variety.] With variegated leaves.

This tree and variety are natives of North America; they are remarkable for their balsamic aromatic nature; the buds and leaves being remarkably fragrant; and any part of the tree being cut or broken, it will emit abundance of fine balsamic juice, or turpentine. Both the varieties assume a beautiful growth, and have great merit for all ornamental plantations.

12. *PINUS americana.*

American Hemlock Spruce Fir.] Rises with an upright stem of moderate height, branching thinly; narrow obtuse leaves, ranged two ways; and roundish cones.

Cedar of Lebanon, and Larch Kinds, having Leaves in Bunches.

There are only three species of those kinds, one a celebrated ever-green tree, of noted antiquity;

riquiry; the others are beautiful deciduous trees; all of them valuable for ornament, and for timber plantations.

13. *PINUS Cedrus.*

Cedar of Lebanon.] Rises with an upright trunk, obtaining considerable height and magnitude, branching horizontally around to a great width: closely garnished with narrow, acute, stiff leaves, in bunches from the same point; and largish, thick, close cones.

It is a native of Mount Libanus in Syria; is very hardy, and prospers here in almost any soil and situation.

This famous and curious tree is the lofty and spreading Cedar so greatly celebrated in scripture; to which many beautiful allusions and comparisons are made; and is most certainly a tree of singular grandeur, after having arrived to some considerable growth, as it spreads its horizontal branches in the most agreeable form, very widely around; which agrees with the allusion of the Psalmist when saying—*She spreadeth her branches like the cedar-tree.* Mount Libanus seems to be the chief place of its natural or original residence; where, by accounts of travellers, there are still a few old trees of prodigious magnitude remaining; but the cones having been dispersed into many different countries, they have raised large plantations of the trees, which in some places are arrived to a considerable size; though in England there are only at present here and there some trees that are of any considerable growth: they, however, are now raised abundantly in all the public nurseries, and of late years numbers of the trees have been planted on many estates, for they will prosper in almost any soil and exposure, and have great merit for all ornamental plantations; likewise as timber-trees: the wood of which being of superior value.

It is said the timber of this fine tree is proof against all putrefaction, and that it will continue sound two thousand years: it was greatly used in the buildings of Solomon's temple, and other sacred structures of antiquity.

14. *PINUS Larix—(Deciduous.)*

(Larix) — the Larch-tree, or Deciduous Pine.] Rises with an upright, straight, whitish stem, to a great height; sending out many slender branches all around, garnished with long, finely-narrow, obtuse-pointed, light-green leaves, in bunches from the same point, spreading open above; and with flowers of different colours in the varieties; succeeded by small, close, acute cones, an inch long.

It is a native of the Alps, Switzerland, and Italy, &c. which, though deciduous, is a tree of beautiful growth.

Varieties.] Common red Larch-tree, having reddish flowers and cones—white Larch-tree—black American Larch-tree—horizontal Larch-tree—dwarf Larch-tree.

15. *PINUS pendula—(Deciduous.)*

Pendulous Siberian Larch.] Rises with a straight, upright stem, to a considerable height, branching out around into many long, slender, pendulous branches; garnished with very narrow-linear, obtuse-pointed, dark-green leaves, in bunches from the same point, spreading open above; and flowers succeeded by small close acute cones.

All these fifteen species of *Pinus* and their respective varieties, have very finely-narrow linear, chaffy, and bristle-shaped leaves, and small flowers of but little appearance, generally produced in April and May; all monœcious, apetalous, amentaceous, and conic; the males collected into conic spikes at the ends of the branches; the females into close oval cones, of many rigid scaly calyxes, which together gradually grow to a hard scaly cone, involving the seeds, one under each scale, ripening in winter and spring; when the cones, as many as wanted for the seed, should be gathered.

Most or all the foregoing species and varieties are trees of lofty growth, of the first magnitude and beauty, straight, swift, and stupendous growers; of which the first-thirteen species are ever-greens; the others, consisting of the Larches, are deciduous; and are all of a hardy nature, so as to prosper in almost any soil and situation; having all great merit both to enrich our ornamental plantations, and most of them also as timber-trees; and for either purpose they may be employed in any exposure in gardens, parks, or fields, or either in plains, or the sides or tops of hills, and in woods and clumps of all sorts; the Scotch Pine in particular is the hardiest of all the sorts; scarcely any country, soil, or situation comes amiss to it, even on the tops of mountains and rocks where there is hardly any earth, and only crevices for their roots to strike into; in short, all the other species of *Pinus* in general possess nearly the same degree of hardiness; for though they may make the greatest progress in deep and somewhat moist soils, yet they will also thrive tolerably both in clayey and sandy soils, as well as in a gravelly, stony, and stony ground; so that all the sorts may be employed almost any where both for ornamental or profitable plantations; remarking, however, that the better the soil is, the greater progress they will probably make in their growth.

Therefore these fine trees are highly proper

for plantations of all kinds, both for pleasure and profit; and will greatly beautify and enliven the scene, as well as cause great variety among themselves, by the difference of their leaves and cones; and as all the sorts produce cones abundantly, furnished with plenty of seed, they may be easily raised in any quantity in the common ground. See their *Propagation*.

It is affirmed that plantations of these trees, besides their being beautiful to behold when growing, and profitable as timber-trees, render the air exceedingly wholesome by their balsamic and aromatic exhalations, which they emit, and diffuse widely around.

They are all very swift growers, as after being a few years old, they often shoot two or three feet in height in the course of one season, mostly performing the whole shoot by Midsummer; and always aspire with one erect firm shoot in the middle, forming the stem, which, at the termination of every year's shoot, sends out a tier of branches circularly.

Considered as forest or timber-trees, they are of great value, as their timber is the principal wood used in our buildings, &c. but the principal sorts for timber-trees are, the Scotch Pine—Pinafter—Weymouth Pine—Swamp Pine—Stone Pine—Spruce Fir, and varieties—and Silver Fir. The timber of these sorts is what we commonly call deal, and is of universal utility, particularly for all kinds of buildings, and innumerable other uses: they are also of great value in ship-building, and are most excellent for masts, in which they exceed all other trees yet known, particularly the Scotch Pine, Pinafter, and Weymouth Pine; but the latter most of all, as it often grows to above a hundred feet high, with proportionable substance.

The Cedar of Lebanon and Larch-tree may also be employed in our plantations of timber-trees, for they will arrive to a great size in this country, as is evident by some old trees now in some gardens, &c.

Most of these trees are resinous or gummy, of an agreeable aromatic smell, but bitter taste.

It is from the Pine and Fir kinds that pitch, turpentine, and rosin are procured; being extracted from the growing trees, in the countries where they abound, and of which is made a very considerable merchandise.

Most of these trees possess also very salutary medical properties. A decoction in milk of the seeds of Pinafter, or the extremity of the young branches pulled in spring, is said, with a proper regimen, to cure the most confirmed inveterate scurvy: the branches of the

common Spruce Fir are used by the Americans for making their spruce-beer.

All the species of these trees are propagated in great abundance in the public nurseries, where they may be purchased in any quantity at moderate rates, or may be easily raised from seed, as directed under the article of their *Propagation*.

It is advisable to plant out all these trees when they are young, three or four to five or six feet high; or if younger, the better; as they will root more freely, and make much greater progress.

The best season for planting all these kinds of trees is autumn or spring, i.e. September, October, and November, for the autumnal planting; and February and March for the spring; though they may also all be removed with tolerable success any time in open weather in winter, from September till March; but those transplanted early in autumn will generally have taken root before winter comes on, and begin to establish themselves more firmly before the drought of the ensuing summer.

When intended to have ornamental plantations of these trees, they may be planted both in clumps and in continued plantations, sometimes by themselves, and some in assemblage with other trees of similar growth, stationing the ever-greens principally with those of that tribe; though, for the general part, they appear to the best advantage when disposed by themselves in various elegant clumps, and running plantations: observing to have a proper intermixture of the different sorts, and allow a proper distance between the trees, that they may have room to spread their heads around distinctly, and be branchy quite to the bottom. Some trees of different sorts may also be disposed as single objects, in lawns, parks, and other spacious openings.

But when designed to have any planted for timber-trees, it is advisable to have quite young plants not exceeding three or four feet growth; and they should always be planted in continued plantations, and set pretty close, so as to draw each other up more effectually in height; for it is the length as well as the substance of this timber that greatly enhances its value; therefore they may be planted only four or five feet asunder, and in seven, eight, or ten years, according to their advanced growth, some may be thinned out, and in two or three years after, the thinning may be repeated; and so continue gradually thinning out the underlings, which will do for poles, spars, &c. and thus should these plantations be thinned occasionally till the principal trees designed for standing are arrived at maturity, whereby they will

will aspire to a great height, with stems as straight as an arrow.

After making any plantation of these trees either for pleasure or profit, no farther trouble or expense is necessary, than keeping down large weeds, &c. whilst the plantation is young, and fencing against cattle; for they do not require any trimming, as the branches of these trees should not commonly be lopped, which would not only spoil the beauty of their natural growth, but would retard their general growth in proportion.

Propagation and General Culture of all the Sorts.

All the species of *Pinus* and varieties in general are propagated only by seed, which will grow freely in the common ground, either in beds or borders of light earth, or in pots or boxes of the like soil, in order for moving occasionally to different situations at different seasons; and the season for sowing all the sorts is in March and April.

Most of the sorts produce cones abundantly in our gardens and plantations, ripening in autumn and winter, containing plenty of seeds; observing to gather the cones in the proper time. All those in particular that are of a loose nature ought to be gathered early in winter; otherwise they are apt to open and disseminate their seeds; but those that are compact and firm may hang longer, and be gathered any time about the middle or end of winter, or towards spring. The cones of most of the sorts are also sent us from the different countries where the trees abound; particularly the Italian Stone Pine, Cembra Pine, Cedar of Lebanon, and of several other curious sorts; and are sold at most of the public nurseries and seed-dealers at moderate rates; either the cones entire, or the seeds cleared from the cones: the method of taking out the seeds is as directed below.

It must be observed of getting the seed out of the cones, that as the cones are composed of numerous hard bony scales, very closely placed, having the seeds lodged between them; and that sometimes the scales being almost united, especially in some of the Pine kinds, Cedar of Lebanon, &c. and often so closely involve the seeds as they cannot be dislodged without violence of breaking or splitting the cones open with an instrument; though those of many of the sorts will open readily by exposing them before a fire, or to the Midsummer sun, when the heat will cause the scales to open gradually, so as the seeds will easily shake out; but by waiting till summer for the heat of the sun to open the cones, we lose a year in the time of sowing, therefore hav-

ing procured a quantity of the cones in autumn or winter, they may be laid before a moderate fire, at some reasonable distance, so as not to scorch the seeds: thus the scales will open, and the seeds may easily be beaten out of their cells; though some sorts, particularly the Stone Pine, Cembra, and Cedar of Lebanon cones, are so close and hard that the seeds cannot be dislodged without violence, as above observed, and is generally effected either by breaking them with a vice, or by boring a hole with an instrument up the middle of each cone, then having a wooden or iron wedge-form peg of a proper size, drive it through the hole, which will split and divide the cone so as the scales may be easily removed and the seeds taken out ready for sowing.

With regard to the proper soil and situation in which to sow these seeds, almost any common light ground in the nursery will do, but give preference, where practicable, to a light sandy loamy soil; and as to situation or exposure, it may either be any of the open quarters of the seminary, or in a somewhat shady border, in which they generally rise stronger than in a full exposure, unless the beds, &c. are shaded occasionally in hot dry weather in sunny days when the plants begin to come up.

The best season for sowing all the sorts is March, but not later than the beginning of April.

Having, therefore, a proper quantity of seed ready, and the ground prepared by proper digging, and formed into one or more beds, three or four feet wide, take advantage of a dry day, and sow the seeds, scattering them moderately thick all over the surface of the beds, beating them gently into the ground with the back of a spade smoothly, and cover them half an inch deep with finely-broken light mould; or where there are only a small quantity to be raised, the seeds may be sown in large pots, or boxes of light sandy loam, covering them the above depth; though this practice is more particularly necessary for the Cedar of Lebanon, in order to move the plants to a shady situation in summer, and to a sunny warm exposure in winter; but for the sake of which convenience, some sow several of the principal Pine kinds in pots or boxes; and sometimes, in order to forward them as much as possible, sow them in pots, and plunge them in a moderate hot-bed just to bring up the plants. They, however, will all succeed tolerably in the full ground, especially all the Pine, Fir, and Larch kinds; and most of the sorts will come up in six or seven weeks after sowing.

Having, however, sown the seed, the following

lowing little attendances are necessary in respect to the care of the seed-bed and young seedling plants. In the first place observe, that as these seedlings generally rise out of the ground with the husk of the seed on their tops, which being once observed by the birds, they will attack them from all parts, and if not prevented, will pull them up as fast as they appear above ground; it is therefore advisable to defend them at this time, by spreading nets over the beds, &c. upon proper support, to remain until the plants are all fairly come up, and have thrust their husks off their heads. In the next place, it will be of advantage at this time to give occasional slight shade of mats, in hot sunny days, to those in a full exposure. Give also occasional very moderate waterings in dry weather; and keep them clear from weeds all summer. With the above care the seedlings will advance and form little slender plants by autumn following, though some probably will only be furnished with a few leaves at top, and just formed buds in the centre, ready to push next spring; others, more forward, will likely have made a short shoot by autumn: observing they are to remain in the seed-bed till a year old: they are hardy enough to stand the winter without any covering, except the Cedar of Lebanon, which, if the weather proves severe, it may be proper to shelter occasionally either with mats or a hot-bed frame: but all the others generally stand the severest frost unhurt; and by spring following, all the sorts should be pricked out into nursery-beds.

In spring following, therefore, the seedlings being one year old, they should in general be pricked out from the seed-bed into nursery-beds: March or beginning of April is the proper time, observing to form beds for their reception four feet wide; then taking up the seedlings out of the seed-bed with all their roots as entire as possible, prick them in the new-prepared beds, in rows six inches asunder; here let them have two years' growth, when by the end of the second summer they will have shot six inches, or more; then, in spring after, it is advisable to transplant them in wider rows, also in the nursery; observing, in this second removal, to set them in rows two feet asunder, and one at least in the lines, as they are to remain here till of a proper growth for final transplantation; they will here shoot six or eight inches more in height the ensuing summer; and in another year they will push with much greater vigour, probably make a shoot of half a yard or two feet long; so that when about four or five years old, they will be advanced a yard or more high; and if they

stand a year or two longer, they will be proportionably taller, and of full size for final transplantation.

Though, for a general plantation, it is most advisable to transplant these sorts of trees finally when not above two or three feet high, as they generally take root sooner, and set to growing more freely than trees of larger growth; for although most of the sorts may be transplanted when six or eight feet high, yet trees of two or three feet most commonly make the greatest progress.

However, when there is a necessity of retaining these trees longer in the nursery, it will be of advantage to transplant them every two years, whereby the principal roots will be kept shorter, and throw out many smaller lateral ones and fibres horizontally, so as to admit of being removed with safety; for, without the precaution of removal, trees of some years' standing would extend their main roots to a great distance, and be unfurnished with fibres, in which case large trees would be very liable to fail, but in the other method, trees of six or eight feet stature are sometimes removed with tolerable success; though the transplantation of such large trees of these kinds should only be practised where an immediate show is required in ornamental plantations.

But I should advise, for the general part, that most of the sorts, the Pine and Fir kinds in particular, have their final transplantation when not more than two or three to four or five feet high, as before hinted, especially where any considerable plantation is intended, more particularly if designed as forest-trees. I have, indeed, assisted in planting many thousands of the Scotch Pine, and others, when little more than a foot high, on the sides of hills and waste grounds, without any previous preparation of the soil, than just making an aperture or hole for each plant, and frequently only making a slit with the spade for the reception of each, leaving them to shift for themselves, and securing the boundaries of the ground against cattle: most of them have succeeded; though, in general, plants about two feet or a yard high are an eligible size for any considerable plantation.

The season for making plantations of these sorts is autumn or spring, or even in winter during mild weather, as already noticed.

In taking up all these kind of trees for any plantation, observe with particular care to raise them with all the roots as entire as possible: preserve also their tops perfectly entire, likewise all their branches, and in that state let them be planted; only previously with your
knife

knife trim any broken or very straggling part of the root.

With regard to the distribution or arrangement in the different plantations, and mode of planting, they are as follow:—Those designed for embellishing the shrubby compartments, and for ornamental plantations in general, may be disposed both in assemblage with other trees, and to form clumps, and continued plantations occasionally of themselves. But those intended as forest-trees should generally be disposed alone in considerable plantations: and, as to the method of planting them, it is the same as for other hardy trees (see PLANTING): observing, however, where large plantations in out-grounds are intended either for pleasure or profit, there will not be any great necessity for a previous preparation of the soil, with respect to digging or ploughing, only just to dig a hole for each tree: the same rule may also be observed in planting clumps of them in lawns, parks, and other grass-ground. Observing, that those designed principally for ornament should be disposed at such distances as their branches may extend freely every way; for the beautiful display of the head is a great merit in these trees in pleasurable plantations; but those intended for timber plantations may be planted only four or five feet distance, in order that they may draw one another up straight and tall more expeditiously, and to admit of a gradual thinning after a few years' growth, for poles, &c. as already observed.

After having their final transplantation, they require but very little more trouble, only observing to clear them, while young, from overbearing weeds; and if any large trees, five or six feet high, or upwards, are planted, it is proper to support each tree with a stake, to secure them against the power of tempestuous winds, till firmly rooted.

Let all the sorts take their own natural growth; being careful to preserve their tops perfectly entire, to shoot up as fast as possible; suffering them also to branch out in their own way; for no pruning is wanted, unless the lowermost tier of branches in any particular trees should be thought too low and straggling, when these may be occasionally trimmed, cutting close to the stem; but prune no further, for it should be very sparingly practised to these resinous trees, as lopping the branches contributes to retard their growth, as well as impair their beauty. Indeed, in large forest plantations, where the trees are arrived to a large growth, it is customary to lop their lower branches gradually for faggots, according as they begin to decay, for where these

trees stand close, the upper branches generally kill those below, so that the lower tiers decay gradually and successively one tier after another; and in which case, these decaying lower branches may be lopped by degrees in winter.

When the plantations designed for timber-trees have had from eight to ten or twelve years' growth, it may be proper to begin to thin them, observing the rules before laid down: those thinned out will serve for many smaller purposes, being careful in thinning to leave a sufficiency of the finest plants standing at proper distances, to grow up for timber.

PIPER, Pepper.

The plants of this genus are principally herbaceous and shrubby perennials of the West and East Indies, introduced here for variety in our hot-houses; obtaining in growth from one or two feet to five, ten, or twelve high, adorned with ovate, oblong, cordate, and lanceolate leaves; and terminal and lateral spikes of small apetalous flowers; no stamina, only two roundish antheræ; a large oval germen, crowned by a triple style or stigma, and succeeded by a roundish, unilocular berry with one seed.

Class and order, *Diandria Trigynia*.

There are many species: the most noted in our gardens are,

1. PIPER *obtusifolium*.

Obtuse Fleshy-leaved American Pepper.] Low herbaceous, succulent stalks; and ovate, thick, fleshy, nerveless leaves.

2. PIPER *reticulatum*.

Netted-leaved American Pepper.] With heart-shaped, seven-nerved, netted leaves.

3. PIPER *Amalago*.

(Amalago) — or Jamaica Pepper.] With leaves lanceolate, five-nerved, and wrinkled.

4. PIPER *nigrum*.

Black Indian Pepper.] With ovate, smooth, mostly seven-nerved leaves.

5. PIPER *aduncum*.

Hooked-spiked Jamaica Pepper.] With ovate, lanceolate leaves, nerves alternate, and recurved hooked spikes.

6. PIPER *longum*.

Long Indian Pepper.] With hearted leaves, some petiolated and some sessile.

7. PIPER *peltatum*.

Peltated, or Target-leaved Indian Pepper.] With target-shaped, orbicular, hearted leaves, obtusely scalloped, and umbellate spikes.

Several of these exotics are retained in our stove collections, to increase the variety; the first three or four sorts are the most noted, or generally known; of which the first is a dwarfish

dwarfish plant: all the others are of considerably superior growth; they being all tender plants originally from South America and the Indies, require the constant protection of our hot-houses in this country, planted in pots, and managed as other similar stove exotics: and may all be propagated by seeds obtained from the countries of their natural production, sowing them in pots plunged in a hot-bed under glasses, or in the bark-bed in the hot-house: some are also occasionally raised by layers and cuttings; and the first sort by its rooting stalks.

PISCIDIA, Jamaica Dogwood-tree.

A genus furnishing for our stove collections two exotic trees, of the West Indies and South America, of moderate growth; garnished with pinnate opposite leaves, composed of several pairs of ovate folioles, terminated by an odd one; and with papilionaceous whitish flowers, having quinque-dentate cups, an emarginated rising standard, two oblong wings, and moon-shaped keel: ten diadelphous stamina, a linear germen, and slender rising style, succeeded by an oblong, narrow, four-bordered, jointed, leguminous pod, of one cell, with cylindric-roundish seeds.

Class and order, *Diadelphia Decandria*.

The species are,

1. **PISCIDIA Erythrina**.

(*Erythrina pinnata*)—*Pinnated ash-leaved Erythrina, or Jamaica Dogwood Tree*.] Piscidia with pinnated leaves, having ovate folioles or lobes.

2. **PISCIDIA carthagenensis**.

Carthagen American Piscidia.] With pinnated leaves, composed of ob-ovate folioles.

Both these species are of the tree or shrub kind, very tender exotics, retained here in our stoves for variety; in which they may be propagated by seed, procured from the West Indies, &c. by the seedsmen, of whom it may be obtained in the Spring, sowing it in pots, and plunged in a hot-bed or bark bed in the stove; and the plants managed as in the general culture of the exotics of that department.

PISONIA, Fingrigo.

In this genus are two species of moderate tree growth, exotics from the West and East Indies, introduced in our hot-houses as plants of variety and curiosity; in which they grow with shrubby-like stems, branching by opposite pairs; garnished with smallish oblong obverse-ovate leaves, and small bunches of yellowish flowers, hermaphrodites and males on two separate plants, having acutely-five-parted calyxes; the corolla tubulous, funnel-shaped, quinquefid, including five stamina, an oval germen with one style, crowned by five spread-

ing stigmas, succeeded by a pentangular, unilocular capsule, containing one oval seed.

Class and order, *Polygamia Diœcia*.

The species, as above, are,

1. **PISONIA aculeata**.

Prickly American Pisonia, or West India Fingrigo.] Pisonia with spreading spinous prickles at the axillas of the branches.

2. **PISONIA mitis**.

Mild or smooth Indian Pisonia.] With the branches smooth or unarmed, not furnished with prickles.

These plants, natives of the hot parts of the Indies, in this country require a constant situation in the hot-house or stove, and treated as other shrubby exotics of that repository; and are propagated generally by seeds in the spring, sown in pots, and to have the assistance of a hot-bed or bark-bed of the stove, &c.

PISTACIA, Pistachia-nut, or Turpentine-tree.

This genus consists of the tree and shrub-kind, furnishing hardy deciduous trees for the shrubbery, and ever-green shrubs for the green-house, all of them of upright growth, rising twenty or thirty feet high, garnished with pinnated and trifoliate leaves, and dioecious, amentaceous, apetalous flowers, succeeded by drupaceous berries, furnished with oval nuts, which in some species are eatable.

Class and Order, *Diœcia Pentandria*.

Characters.] **CALYX**, male and female flowers on distinct trees, the males collected into loose, sparsed amentums, composed of small scales, each having one floret, furnished with a very small, five-parted perianthium; and the females in clusters, with small trifid cups. **COROLLA**, small florets without petals. **STAMINA**, five very small filaments, having large, oval, tetragonous, erect, petalous antheræ. **PISTILLUM**, an oval germen, three reflexed styles, with thick hispid stigmas. **PERICARPIUM**, an oval berry-like drupe, having an oval smooth nut.

There are five species, four of which are hardy shrubs, mostly deciduous; the other is a tender ever-green for the green-house.

Hardy Kinds.

These kinds, however, though denominated hardy, are rather tender whilst young, at least those raised from seed, requiring shelter of a green-house or garden-frame, in winter, till four or five years old, and are become a little woody.

1. **PISTACIA vera**.

True Pistachia-tree.] Rises with an upright stem, branching twenty or thirty feet high, covered with a russet cracked bark, but the younger branches smooth; large pinnated leaves,

leaves, of two or three pair of oval recurved lobes, terminated by an odd one; and from the sides of the branches small greenish flowers in amentums and bunches, succeeded in the female trees by clusters of oval fruit, containing large eatable nuts.

It is a native of Persia, Arabia, and Syria, from whence the nuts are brought annually, for they rarely ripen here in our gardens, and are sold in the shops by the name of Pistachia-nuts.

2. PISTACIA *Terebinthus*.

(*Terebinthus*) — or *True Turpentine-tree*.] Rises with an upright branchy stem, about thirty feet high, having a dark bark full of cracks; pinnated, dark-green, alternate leaves, of three or four pair of oval-spear-shaped lobes, terminated by an odd one; and small greenish flowers.

It grows naturally in Italy and Spain, and from its trunk flows the true Turpentine; but that of some of our Pine-trees is commonly substituted.

3. PISTACIA *trifolia*.

Trifoliate Pistachia-tree.] Rises with an upright branchy stem, between twenty and thirty feet high, having a rough brown bark; trifoliate or three-lobed, dark-green leaves; and small greenish flowers.

4. PISTACIA *narbonensis*.

Narbonne Turpentine-tree.] Rises with an upright branchy stem, about twenty feet high, having a whitish bark; pinnated leaves, mostly of three or five roundish lobes; and small greenish flowers.

The first sort is the hardiest of all the above four species, and the third and fourth are the tenderest, and are often kept here in the green-house collections, also sometimes the common Turpentine-tree; but they may all be gradually hardened to bear the full air the year round.

Green-house Kinds.

5. PISTACIA *Lentiscus*.

(*Lentiscus*) — or *Mastic-tree*.] Rises with an upright branchy stem, fifteen or twenty feet high, having a greyish bark; abruptly pinnated leaves, of three or four pair of spear-shaped lobes, not terminated by an odd one; and small greenish flowers.

From this species and variety is collected the Mastic of the shops.

Variety.] Narrow-leaved *Lentiscus*.

All the above five species of *Pistacia* flower generally in April; they are universally dioecious, or male and female upon two separate trees; are small and without petals, with the males collected into amentums, and the females in bunches, mostly of a greenish colour, so make

no show; and those of the females are succeeded by clusters of fruit, ripening to a blue or blackish colour, inclosing the nuts; but these never ripen in England.

With respect to the merit of those trees in our gardens, observe as follows:

The first four species are proper to increase the collection in curious shrubberies, observing, as they are of somewhat tender quality, some should be kept in pots for moving to occasional shelter from frost whilst young, till three or four years old, so as they have obtained a little strength, and become woody, when they may be turned out into the open ground, in a dry warm situation; and should also retain some in pots, to have occasional shelter among the green-house plants in severe winters, more particularly the *Trifoliate* and *Narbonne* kinds; which two sorts, if sheltered in winter, will often retain their leaves great part of the year; and being more tender than the first and second, they are in many gardens retained as green-house plants. All these four sorts, however, denominated hardy, may be gradually hardened to bear the full air the year round, as aforesaid.

The fifth sort, *Lentiscus* or *Mastic*, is a pretty ever-green, of a tenderer nature than the other four, so must have shelter, all winter, of a green-house; in which collection it highly merits culture, as it effects a distinguishable variety at all seasons of the year.

Their Propagation, &c.

The propagation of all the five species is principally by seed; and some sorts also by layers.

By seed.—The nuts are the seed, which of all the sorts are procured from abroad annually, and may be obtained at most of the seed-shops and nurseries, &c. observing they all require the aid of a hot-bed. Let them be sown early in spring, in pots of light earth, half an inch deep, and plunge the pots in a hot-bed, just to bring up the plants: when this is effected, be careful to admit a large portion of fresh air daily, and by degrees harden them to it fully in June, giving frequent refreshments of water all the summer; and in autumn remove the pots to the shelter of a hot-bed frame, or a green-house, to remain all winter; then in spring following, plant them out into separate small pots, which if directly plunged in a moderate hot-bed, it will greatly facilitate their rooting, and set them forward; but when they begin to shoot, harden them to the full air, still continuing a proper supply of watering, and in autumn remove them again to a frame or green-house, for the winter; which care must be repeated to all the sorts till they are three or four years old,

old, as aforesaid; shifting them occasionally into larger pots. After this, most of the four hardy kinds may be turned out into the shrubbery compartments to remain, retaining some in pots for removing under protection of a frame or green-house, occasionally in severe winters: but the *Lentiscus* must always be continued in pots to have shelter in winter with other green-house exotics.

By Layers.—Most of the sorts may be tried by this method: but the *Lentiscus*, in particular, is very commonly propagated by layers. Choose the most conveniently situated young shoots, which lay in spring or summer by common laying, and they will be mostly well rooted by the following autumn; when they should be taken up and potted separately, and managed as the seedlings.

PISTILLUM, the Pistil, or Pointal of the flower, or female organ of the generation of plants, rising in the centre of the flower like a column, consisting of the germen, style, and stigma.

1. The *Germen* forms the base of the *Pistillum*, and is the seed-bud, or rudiments of the seed-vessel, or fruit, and supports the style, elevated like a pillar in the middle of the flower. See GERMEN.

2. The Style (*Stylus*) stands upon the summit of the germen, elevated like a column, and corresponds to the *vagina* in animals, being generally somewhat hollow like a tube, though the tubular parts are often so fine as to be scarcely perceptible, serving to transmit the effluvia of the fecundating dust, or *Pollen*, through into the heart of the germen, or seed-bud, for the purpose of impregnating the seeds, and is terminated by the stigma. See STYLUS.

3. The Stigma is the summit or head of the style, appearing frequently like a knob or head, and when there is no style, it adheres to the summit of the germen; and its use is to receive the male dust from the antheræ; thence transmitting its vapour through the *vagina*, or style, aforesaid, into the heart of the seed-bud, for the purpose of impregnation. See STIGMA.

Each of the above parts of the *Pistillum* is more particularly explained under its respective head.

PISUM, the Pea.

This genus consists wholly of hardy herbaceous plants, one species of which, the *common Pea*, an annual, is the parent of all the numerous varieties of Peas cultivated in our gardens and fields for common use, the merits of which, as esculents, are universally known; all of which rise with long, slender, cirrhous

climbing stalks; garnished with cirrhous-pinnated leaves, and papilionaceous flowers, succeeded by that sort of seed-vessel called a legumen, or pod, filled with Peas, the eatable part of the plant.

Class and Order, *Diadelphia Decandria*.

Characters.] CALYX is monophyllous, acutely five-parted and permanent. COROLLA is papilionaceous, consisting of a broad heart-shaped, reflexed, indented standard, ending with a point; two short, roundish, connivent wings, and a shorter, compressed, semi-lunulated keel. STAMINA, ten diadelphous filaments, crowned by roundish antheræ. PISTILLUM, an oblong compressed germen, a triangular, rising, membranaceous style, and oblong hairy stigma. PERICARPIUM, a large, long, bivalvular pod, ending in a point, containing one row of roundish seeds or Peas.

The principal distinction between this genus and *Lathyrus*, (*Everlasting Pea*, &c.) is, the style of this is triangular, and that of the *Lathyrus* is plane. See LATHYRUS.

There are several species belonging to this genus, but, of which, not more than one merits particular observation for our purpose, considered as a plant of valuable utility, or a profitable domestic esculent for general culture, which is the *Common Cultivated Pea*, comprising, however, numerous varieties; for all the sorts of garden and field Peas are varieties only of one species; but whether the common white Pea of our gardens, or the grey field Pea be the original kind, is uncertain. The other species alluded to are considered principally as plants of botanical variety.

Cultivated Kinds.

1. *PISUM sativum*.

Cultivated common Pea.] Rises with long, slender, trailing stalks, by clasping upon support, from two to six or eight feet high; pinnated, cirrhous leaves of two or three pair of lobes, terminated by cirrhi, or tendrils, and have taper foot-stalks, with roundish, indented stipulæ below; and at the axillas long pedunculi supporting many flowers, &c.

Varieties.] Common white Pea—common grey field Pea: each of which comprising many varieties.

Each of these two principal varieties of this species, *Pisum sativum*, comprise numerous others, particularly the white sort; and new ones are obtained almost every year, in one place or other, differing from one another in some little particular, either in their growth, manner, and time of blossoming and bearing, size and form of the pods and peas, together with their quality for eating; and several other

other little properties or singularities, all of which are accidental varieties, rising from one another; for suppose we were to cultivate only any one of the varieties, we by observation will find plants varying from the original sort, sometimes probably for the better, and sometimes worse; but the first only is to be regarded; and it is by observing this, that curious persons have increased the valuable varieties, when by examining their crops, and finding one plant very different from all the rest, or any other known sort, either by its blossoming and bearing earlier, or some other valuable singularity, they carefully mark it, and preserve all its produce for seed; which being sown separately for two or three years, or till having multiplied them sufficiently to be distributed, they are sent into the world as a new sort, bearing the name probably of the place, or person who first obtained them, such as the Charlton Pea, &c. Thus the different varieties of Peas are obtained, and each respective variety multiplied for public supply; some of which varieties differ very materially from one another, either by their early bearing, or by their larger growth, or the like, though some reputed varieties differ so immaterially that the difference is hardly distinguishable. And it is to be remarked of all these acquired varieties, that although some are tolerably permanent, yet without proper care in saving the seed of each sort separate, they will all gradually degenerate to one another, or to the common white or grey kind; so that it would in a manner be impossible to pretend to enumerate all the varieties of Peas, or to give any particular description of all the different sorts; therefore we shall only exhibit a list of the principal varieties that are at present the most commonly known and esteemed; which, though pretty many, there are not above five or six that have merit for general culture; some of which are moderate growers, and early bearers, commonly called Hotspurs, others are large growers, and come late into bearing.

Most material general varieties are of the two following classes.

1. *Principal, middling, and smaller Kinds for early and main Crops, &c.*

Early Charlton Hotspur Pea—early golden Hotspur—Nichols's early golden Hotspur—Reading long Hotspur—Masters' Hotspur—Ormrod's Hotspur—early dwarf Hotspur—Leadman's dwarf Pea—dwarf fan Spanish Pea—early dwarf frame Pea, for hot-bed frames—pearl Pea—cluster Pea—royal green Pea—large grey Pea—crooked grey Pea—egg Pea—long bearing Pea—green seeded field Pea, for the dry Peas to boil—white field Pea for the same occa-

sion, &c.—with several other supposed varieties of less note, that hardly differ any thing from some or other of the above sorts.

Most of the above varieties in this class of Peas are moderate growers, rising upon support of sticks three or four to about five feet high, in the larger kinds; the dwarf sorts scarcely half so much, some not above a foot high; the greater part are plentiful bearers, but the most profitably so for general service in garden culture, in the first five or six sorts, proper both for early and main crops, producing largest well-filled pods, and continue longer in successional production and abundance: and of which, in the early Hotspur kinds, the first three differ not very materially, only in some arriving to bearing for gathering a few days or a week earlier than the others, more particularly in the golden Hotspurs, which, and the Charltons, are the most estimable for the first early and principal general forward crops; though any of the other three larger Hotspur kinds are very eligible for a general and principal succession crop; particularly the Readings, Masters, and Ormrods, which have preferable merit to make a principal share in the general crops, on being remarkably full bearers, and producing fine long pods regularly well-filled with larger-middling Peas, generally of equal full growth: or may also admit some of the other larger sorts in a secondary way for variety—and as to the dwarf Peas, they, according to their size of growth, are mostly very full bearers, the pods generally small and numerous, with the Peas small in proportion, but particularly sweet eating while young, and are eligible to sow in smaller portions, a few for early production, and a larger sowing for succession and late crops, especially of the Leadman's dwarf, for its very abundant bearing: likewise some of the forwardest dwarf sorts have peculiar merit for small early crops both in borders and frames.

However, for the general early and principal crops, the larger Hotspur kinds before noticed are the most valuable; and by different sowings of these from the latter end of October, or beginning or some time in November every month till May, or occasionally some of the other larger sorts and dwarf kinds, they will produce a daily supply of young green Peas from May or June until August or September, though will be succeeded in July and August plentifully by the following largest kinds of Peas.

2. *Larger-growing later Kinds with largest Pods, &c.*

Large marrowfat Peas, of tallest growth and largest pods—dwarf marrowfat Peas, of lower growth

growth and fine large pods—green marrowfat Pea, very fine—Spanish moratto Pea, moderately large pods—green nonpareil Pea, middling large pods—large egg Pea—green rouncival Pea, of strong growth, and fine large pods—white rouncival Pea of similar growth, and large pods—grey rouncival Pea, similar to the foregoing in growth and production—large crooked sugar Pea, of strong growth, and very large long bowed pods—dwarf sugar Pea, with similar pods—rose or crown Pea, rising with thick strong stalks, crowned by the blossoms and pods principally at top in a large umbellate cluster, esteemed more for curiosity for its singular mode of flowering and bearing, than to cultivate for any general crop; though the pods are large, and the Peas exceeding good eating while young—painted-lady rose or crown Pea, similar in growth to the last, the blossoms variegated red and white, and produced in a cluster at top as above—large grey field pea.

These large kinds mostly assume a strong growth, and will rise upon support five or six feet, or some seven or eight feet high, and produce fine large pods in tolerable plenty; the marrowfats and Spanish morattos in particular bear abundantly, and are profitable both for family use and market; but the marrowfats are most esteemed for the main crops; though the green nonpareils, and the rouncivals, being also fine large good Peas, are very eligible to cultivate as secondary latter crops, in variety with the other large kinds, especially in family gardens; likewise, where there is proper scope of kitchen ground, the sugar and crown peas are very deserving of culture in the order as above, in moderate portions; the former being curious in its large, long, crooked pods, and the young Peas thereof exceedingly sweet and good; and the crown Pea singularly curious in its peculiar strong growth and mode of production: so that, agreeable to these intimations, the different varieties of the above large kinds may be cultivated more or less as inclination or convenience may suit. Observing, all these large kinds are proper to sow chiefly in spring, from January and February until May, to supply the table in July and August; and by sowing late in May and in June, a succession may be continued from the beginning of July until near Michaelmas.

Great as the above number of the different varieties of the cultivated common Peas, both of the first and second class thereof, they are wholly the off-spring of one parent species, that have arisen from the seed at different periods of time by chance; and the respective

sorts, according as they occurred, have been abundantly increased by good culture sufficiently for general supply.

2. *Pisum Ochrus*.

(*Ochrus*)—or *Wild Winged Pea*.] Hath angular stalks growing about a yard long; diphyllous or two-lobed leaves, having membranaceous, decurrent-winged foot-stalks; and pedunculi sustaining one yellow flower, succeeded by oblong pods, containing roundish compressed Peas.

3. *Pisum-maritimum*.

Maritime Perennial Pea.] With angular stalks, petioles plane, above arrow-pointed stipulæ: and peduncles having many flowers.

4. *Pisum Americanum*.—*American, or Cape Horn Pea*.

Of the above four species of *Pisum*, the principal and only economically useful one is the *Pisum sativum*, including all its different varieties before explained under the said parent species; most valuably useful culinary vegetables of the annual tribe, produced from seed sown annually in spring, &c. arriving to perfection of growth the ensuing summer and autumn, yielding their abundant produce in those seasons, then wholly decay or perish the same year; the plants being of very short duration after attaining full growth, seldom continuing longer in the same crop than about two or three weeks in production, so that a fresh supply must be raised annually from seed; and that to have a regular supply of the varieties of the common Pea for use from the earliest part of summer until Michaelmas, several different sowings from October or November until May or June are necessary; for as a crop of Peas continues but about a fortnight in full bearing, a repetition of sowings once in three weeks or a month during the above period, furnishes a constant succession in continuation four or five months.

The other three species of *Pisum* are only proper for culture, principally for variety in general collections, or as may be required.

General Observations.

All the sorts are hardy, and thrive in the open ground in almost any common soil of a garden and field: observing the early sowings should generally be in a warm dry situation, and the general and later crops in any open exposure.

The plants of all the varieties are of trailing growth, though of the cirrhous-climbing kind; for being furnished with cirrhi or tendrils, terminating the ends of all the leaves that catch hold of any adjoining bushes, or branchy sticks, &c. they encounter in their progress, the stalks thereby climb, ascend

aloft, and support themselves very erect, and mount several feet high, bloffoming and bearing as they ascend in their advanced growth: which indicates, that although they are procumbent or trailing plants, they being furnished with claspers for climbing, as above, nature seems to have designed that the generality of them should climb and erect themselves from the earth, for the more effectually producing their respective crops in the utmost plenty and perfection; therefore, in their general culture in gardens, it will always be found of much advantage, in their production, to allow the whole or principal part, as far as possibly convenient, the support of tall branchy sticks, three or four to five, six or seven feet erect, according to the growth of the different varieties; which may be practicable enough for moderate quantities, in places where branchy loppings of trees or of any bushy underwood, &c. can be obtained in sufficient plenty; and, as garden peas are always cultivated in rows, by placing a range of such branchy feathered sticks along each row, the plants most readily attach themselves thereto by means of their cirrhous claspers, and aspire fast in height to their tops; bloffoming and bearing as they advance, in considerably greater abundance and perfection, and the plants continue longer in successional production than such as have no support, but permitted to trail on the ground.

In the garden culture of peas, they are always cultivated in rows, by sowing in drills two or three, to four or five feet asunder, according to the smaller, middling and larger-growing kinds; which being not only the most commodiously effectual method of sowing Peas in general, but is also the most eligibly adapted according to the nature of growth of the plants, as well as for admitting of proper room between the rows to perform the occasional necessary cultural work of hoeing, sticking, &c. and of gathering the produce, &c.

Peas, comprehending the different varieties, rank among our most useful and profitable summer esculents of the kitchen garden, valuable both to supply our tables with their produce, young and green in the pod all summer, from May, or June, till September; and also when ripe, in some of the middling-smaller kinds dried and threshed out, for dry Peas to lay up till winter, &c. for several very useful culinary purposes, as Peas-soup, Peas-pudding, &c. though the chief merit of the principal varieties for garden culture is for young green Peas to gather for immediate use during the summer season; principally in

June, July and August, for the main crops, sown at different times from December or January, until May, &c. but by sowing so early as October or November, and continuing it in a monthly repetition till spring, then in the advanced part of that season, from March till May, every three weeks, and then once a fortnight until the end of June or July, a daily succession of green Peas is thereby obtained, from the beginning, middle, or some time in May, according to the temperature of the season, till the latter-end of September; though the late crops, sown after the middle of May, and in June and July, for gathering in August and September, are seldom so effectually prosperous in production as the early and general summer crops, being sometimes liable to be attacked by the autumnal mildew, or much retarded by the drought of the ground, and heat of the weather; however, as in some families young green Peas are in request as early and long in the season as possible, in which case it is eligible to sow both early and late, but always in larger supplies for the principal general crops: so that the most general season for green Peas in full production for gathering, in the main crops, it may be observed, from the above intimations, is principally June, July, and great part of August, by sowing in December, January, February, &c. until May; but by sowing so early as October or November, continuing a monthly repetition, as before suggested, till June or July, we often obtain a regular succession from May to the end of September.

Of the foregoing two classes and different varieties of the cultivated Peas, the principal sorts most eligibly estimable for general culture, or superior bearers and preferable quality of the produce, are, chiefly the Goldens, Charltons, Reading and Master Hotspurs, for the first early and general crops; and of the larger sorts, the Marrowfats, Spanish Morattos, Nonpareil, and Rouncivals, for the second or successional general supply: all of which are great bearers, and excellent fine eating Peas; the Marrowfats are superior of the large Peas for sweetness of eating, and richness of flavour, and merit culture in larger crops than the others of that class: but as there are many other different varieties of Peas than the above-mentioned, curious persons, having eligible scope of ground and other accommodation, may raise any of the sorts, less or more, according as may be convenient, though generally in smaller quantities than of the above-named principal varieties; especially as I have generally observed, that

about five or six different principal sorts were always fully sufficient for the main general crops, with which the table has been plentifully supplied during the whole season of Peas; though any of the others in request are also eligible, as Secondaries, to increase the variety, and several of which are very deserving of culture, agreeable to the above intimations.

In the first class of varieties, consisting of the middling and smaller kinds of Peas, are comprised several valuable principal sorts most eligible for the early and first main crops; particularly the early Golden and Charltons, the Reading, Masters, and Ormrod hotspurs; the two former coming in the earliest, and the three latter are excellent for a full crop, with some preference to the Readings in producing larger long pods in singular abundance: though all these sorts have a great similarity, are most excellent and profitable Peas, and desirable kinds for principal culture, almost the whole Pea season, and are peculiarly adapted for the early and principal forward crops, as they come into bearing sooner than the large kinds of the second class, by a fortnight, if both sorts are sown in the same day, beginning first with the Golden and Charltons, for the principal early and first and second large crops, to sow before and after Christmas, or may be continued through the spring sowings, if thought eligible; proceeding in the first sowing towards the latter-end of October, or rather the beginning or middle of November for a more certain successful early crop, repeating the sowings in December and January, &c. in larger portions, at about three weeks' or a month's interval, or not above three weeks in the advanced spring months; observing also to sow some good crops of the Readings, &c. before mentioned; remarking, that these and the other hotspur kinds may be sown in full crops in December, or January and February, &c. at the above mentioned intervals; but in April and May once a fortnight, or eighteen or twenty days at most, would be eligible; and by which intervals of sowing you will have a plentiful daily supply for gathering in regular succession throughout the proper season, May or June, July and August, &c. each crop continuing only about a fortnight or three weeks in bearing; so that the different sowings succeed each other regularly.

All of which kinds should be sown in drills not less than two feet and a half to a yard asunder; but where designed to assist them with support of sticks, three feet and a half, or four feet, between the rows, is eligible;

or for sticking, some may be sown in double drills, i. e. two rows together a foot asunder, allowing a wide interval of four feet between the double rows; so, in either method, placing a range of sticks to each row of Peas, when arrived to a proper growth of six or eight inches.

I have, in some early crops of Hotspurs, advancing to bearing soon in May, permitted the gleanings to stand for seed, which ripening pretty forward in June, have threshed them out and sown them directly; and the plants coming up in a few days advanced freely to full growth, and produced a crop of Peas the same year for gathering in August and September.

Respecting the other varieties of Peas, ranged in this first list; some of the dwarf sorts are estimable for their early production, such as the dwarf Hotspur, proper to sow early on warm borders, and others for early crops in frames; and some are singular and curious in their dwarfish growth, requiring but little room, comparatively, in their culture, and bear very agreeably, according to their peculiar nature, and are eligible to cultivate occasionally in small secondary crops for variety, sown any time in the common season, January, February, or March, till May or June; but generally more abundantly in the Leadman's dwarf, for its great prolification, and which may be sown both in the early and middle season, or in any of the spring and summer months, till June or July, as it also succeeds peculiarly well for a late crop in autumn: all of which dwarf kinds are sown in drills two feet asunder, and generally have sticks to run upon, proportioned to their growth; and with respect to the other larger sorts of Peas comprised also in the said first class, they, although not possessed of any superior property for principal culture, are mostly tolerably full bearers, and very good common eating Peas; any of them are eligible to cultivate occasionally, as may be required, to furnish a greater variety of different sorts for the table; and may be sown in the common middle season, January or February, March and April, &c. in drills, the distance intimated for the principal Hotspur kinds.

And of those of the second class, comprehending all the principal largest varieties of Peas, the greater part are most excellent sorts to cultivate for the main successional and general latter crops; and for which occasions a considerable share should always be allotted in every garden, &c. where there is ample scope of ground to admit of their culture accordingly;

ordingly: preferring principally the Marrowfats for the large main crops, and as secondaries, the Spanish Moratto, Nonpareils, Rouncivals, and egg Pea; all of which may be sown in any of the spring months, or in repeated monthly sowings from December, January or February, in open weather, till May; though, in March and April, a sowing every three weeks or fortnight is proper, and once a fortnight in May and June, and which different sowings will furnish principal crops in full bearing in July and August, and smaller successional productions in September; but observing, in the principal general sowings, still to give preference to the Marrowfats for the chief crops, particularly the dwarf kind, for principal culture; secondary to these two sorts, the Spanish Morattos, then the Nonpareils and Rouncivals, &c. and of the latter it is proper to remark that they are not only proper to sow any time in common with the others as above, but are also peculiarly eligible for late crops, sown in April and May, or even till June, as these sorts generally endure the drought of summer better than most of the other large kinds; however, where variety is in request, any or all the above sorts, if approved of, may be sown at different times, less or more, as required; also the sugar and crown Peas, the former curious in its large bowed pods, and the Peas thereof most sweet eating; and the crown Pea is a singular curiosity in producing its large bunches of blossom and pods crowning the top of the stalks in a curious manner: generally, in the whole, beginning with the Marrowfats, not earlier than December or principally in January or February, March and April, &c. first the dwarf kind, which indeed, in some respects, is rather preferable, or more eligible for general continuance in sowing than the large marrowfats, as this sort requires considerably more room to grow, and taller sticks for the plants to run upon to their full length, otherwise they do not succeed in good perfection; but with such assistance, however, they bear wonderfully; so that where there is every convenience, it is proper to sow both these sorts; and as many of the approved kinds of the others as may be thought expedient, either as general or secondary crops.

According to the different seasons of sowing for the several crops, different exposures and situations should be observed as much as conveniently practicable; such as, for the earlier sowings in October or November, and December, should allot some warm south borders under walls, palings, or hedges, &c.

or some similar warmest dry compartments; and for sowings after Christmas, may generally allot more open situations, except where no sowings were performed before that period; in which case it will be proper to have the first sowing on a warm border, &c. as above, that the crop may come in as forward as possible according to the time of sowing; but for the general or larger forward and great main crop of any of the varieties of Peas to sow in January, or February and March, &c. should be principally in the open main quarters of ground; and generally in, at least, doubly larger portions, than the earlier crops.

And, as before observed, as a crop of Peas generally continues but a fortnight or three weeks in full production, proportionable frequent repetition of different sowings every month is indispensably requisite, especially in principal family gardens where a constant daily supply is demanded; but in considerable large crops in market gardens and fields for public supply, where required only during the principal Pea season of June and July, &c. probably about four, five, or six different sowings, from November, December, or January, &c. till April, may be sufficient; however, where a regular succession of Peas is required from the earliest to the latest season, should repeat the sowings every month in open weather, before Christmas; or even at intervals of only three weeks; if began sowing at the earliest period, in order thereby to have the greater chance against accidents from inclement weather in winter, and the depredation of vermin during that season; but from about Christmas till March, sow in open dry weather, once or twice every month, and from that time once a fortnight or every three weeks, till the middle of May, or in that month and June, moderate sowings once a fortnight, for late crops; making also trial of a small sowing the early part of July for a latest produce in September; and sometimes, in fine autumns, continue in a small production till October.

But where it is only required to have moderately forward, and some good general crops in regular succession during the principal season, the proper time for sowing, and the most certain and successful for good plentiful production, is from December, or beginning, middle, or anytime in January, when open temperate weather, continued every three weeks till the end of April, which will afford plentiful crops of peas in June, July, and greatest part of August; or February, March, and April, is a most successful season for sowing general full crops, for plentiful bearing two or three months

months in the principal season of Peas, June and July till the middle of August; after which, the produce is generally less abundant, and inferior in growth.

When, in the main crops of Hotspurs and the Marrowfats, &c. it is required to have the latter succeed the former regularly in bearing, both sorts being sown on the same day, or within a day or two of each other, the Hotspurs will come in soonest about a fortnight, and the Marrowfats will arrive to bearing in regular successive order accordingly, in proper growth for gathering: and, if Marrowfats and Rouncivals are sown in the same order, they will advance to production nearly in similar succession, the Marrowfats a week before the others.

In all the different sowings in the general varieties, the plants are always to remain where sown, to attain perfection in their general growth and production, though sometimes a few are transplanted, on particular occasions, for early production; such as either when the main earliest sowings are cut off by the severity of the winter, &c. or omitted sowing an early crop at the proper season; or sometimes, exclusive of any of these occurrences, a small portion is sown early, or a little before or after Christmas, either occasionally in a moderate hot-bed, or in a bed or border of natural earth, under a frame, &c. or sometimes sown thick in one or more large pots, and placed in a hot-house, forcing-house, or any common hot-bed, just to raise the plants as forward as possible, about an inch or two in growth, when, in either method, inuring them gradually to the free air, generally every mild day, giving protection of cold nights, frost, and other inclement weather, until the season commences somewhat settledly temperate in January, or early in February, &c. then, being thus defended over the inclement season, transplant them into some warmest south border in a row close along under the wall, or other similar fence, equally in a small neat shallow drill: they thus have a chance of coming into bearing at the most early period of the natural ground crops. Likewise for raising the most early crops of Peas in frames by hot-beds, &c. the plants being previously raised by sowing, as above, in November or December, &c. and when an inch or two high, are transplanted into fresh-prepared hot-beds of dung or tan-bark, under frames and glasses; or sometimes, when raised as above, are transplanted into beds of natural earth under frames and lights, but are obtained much forwarder in hot-beds; however, either of which are only practised occa-

sionally for a small earliest crop, in places where there are all proper conveniences, and that a few young Peas are in particular request as early as possible, March, or April, &c. But, as before observed, all the general crops of Peas, early, middle, and late, are always sown in the full ground in rows to remain for full growth.

The whole in the different crops being always necessarily cultivated in rows, as observed before, by sowing the seed or Peas in drills drawn in the earth with the corner of an hoe, these should be drawn about one to two inches deep, or but little more, according to the sizes of the Peas, seasons of the year, and nature of the soil, generally shallower in winter and wetish ground, than in the advanced warmer season, and dry light soils; and being careful to allow requisite abundant space between the lines or ranges, according to the growth of the different sorts of Peas intended, for the free admission of sun and air, as well as for performing the necessary culture, and room to go between to gather the produce without breaking down the plants. Allow, therefore, the smaller kinds not less than two feet, or two and a half, between the rows; but if intended to give them sticks to run upon, allow three feet at least, or rather three and a half, between the lines in rich ground; and the larger kinds should be allowed a yard or more between the rows even when no sticks are intended; but if designed to stick them, four or five feet is requisite for the largest sorts, such as the tall Marrowfats and Rouncival kinds. For it is most necessary, where practicable, to allow all the sorts sticks: placing a range of any sort of tall branchy sticks, or brush-wood, along each row of plants, when about half a foot high, for them to climb upon for support, whereby they will produce double the quantity of Peas, as when suffered to trail on the ground. This, however, though not generally practicable where large quantities are raised in fields for the supply of market; yet for moderate quantities in private gardens, where sticks can be readily obtained, it should never be omitted, as the advantage will be more than double.

Observe always to allow more room by a foot, between the rows for those crops that you design shall have support of sticks, than those that are not; for Peas that have support always grow strongest; and if they have not proper room, the plants of the different lines will interfere, and both interrupt the growth of each other, exclude the necessary influence of the sun and air, and not admit of room to gather the Peas without breaking the plants, to

to the great diminution of the crops; but give them proper room and support, and you will reap the advantage in proportion.

But when intended to allow Peas support of sticks, some may be sown in double rows, with very wide intervals between, that is, beginning at one end of the ground, sow two rows together, only a foot asunder; then, if for the Hotspur kinds, leave a space of four feet, or if the large kinds, five feet, and sow two more rows a foot apart; then allow another wide space, and sow other two close rows, &c. and so proceed throughout: by this practice you have the ground equally filled as if the rows were single and closer; and by the abundant room in the wide spaces, it admits all the advantage of sun, air, and of gathering the produce freely without incommoding the plants.

Seed Peas of all the sorts are sold at all the seed-shops and nurseries at moderate rates, commonly by measure, as by the bushel, peck, &c. or in smaller quantities for private gardens, by the quart or pint.

Their Propagation and General Mode of Culture.

As to propagation, all the sorts are raised from seed, i. e. the Peas sown annually: the plants being but of one season's duration, an annual repetition of sowing is consequently necessary; and as those of one sowing continue but a short time in bearing, several sowings are requisite each season, to continue the succession for the table all summer; each sowing to remain where sown, choosing a warm border, &c. for the earliest crops; and for the succeeding ones, any of the common open quarters are the most eligible, in a free exposure, distant from shade of trees, &c. and open to the free air and sun; fixing on the driest warm soil for the forwarder crops, any common soil for the main crops, and the moistest parts for the late crops.

The general season for sowing is any time in open weather, from the latter end of October, or any time in November, until May or June; but remarking, that during the above period several different sowings are necessary, in order to keep up a constant succession of young Peas for gathering several months in summer, i. e. from May until September; for those sown in October or November, if they survive the winter, come into bearing in May and June, and by repeated sowings at a month, three weeks', and a fortnight's interval, till May, as we before remarked, they will furnish a constant supply of Peas all the summer; and those sown late in May and in June, or occasionally the beginning of July, very often

continue a moderate supply in autumn till the end of September, and sometimes a few in October. With regard, however, to the earliest sowings, from October or November till the beginning of January, they are liable to accidents from the severity of the weather; and if they all stand the winter, those sown in October or November will scarcely be a fortnight earlier in bearing than those sown six weeks or two months after: it is, nevertheless, proper to begin early, and repeat the sowings at the intervals before mentioned, that there may be a sufficiency for substitutes in case of accidents; and also, if they all survive, that there may be a regular succession of crops coming into bearing, to afford a daily gathering through the whole season.

But, in order to have green Peas as early as possible, recourse is had to the assistance of hot-beds, by the aid of which, young Peas are obtained in March and April, and continued till the coming in of the natural ground crops in May or June.

We, however, will first proceed with the culture of the several principal crops in the natural way; then by hot-beds.

Hotspur Kinds for the early and first general Crops.—In the latter end of October, or in November or December, as may be convenient, begin to sow the earliest crops; though in warm gardens it is always advisable to sow a few in the two former months; but in general, or especially in open grounds, November and December is time enough to begin any principal sowing, choosing the earliest Charlton or Golden Hotspurs; and for their reception prepare a warm south border, or some other dry, sheltered, sunny situation; and in a dry day draw drills by line, ranging south and north, to enjoy the greater advantage of the sun's influence, making the drills an inch and a half deep, and two feet and a half at least asunder; but if designed to allow them sticks, three feet and a half will be the more eligible distance, as we before observed: then having the seed, or Peas, scatter them evenly along the middle of each drill, rather somewhat thickish at these early sowings in winter, because they are liable to accidents from the attacks of vermin, and the inclemency of the season; covering them in evenly with the earth, either with a rake or hoe, or turned in with the feet; being careful that they are all equally covered the depth of the drills; and then with a rake lightly trim the surface smooth, which finishes the work of sowing. The seeds will begin to germinate in a fortnight, if mild weather, and will come up in three weeks or a month, seldom in less time

at this season ; when the plants are to be managed as hereafter directed.

Having thus performed the first sowing of the Hotspur kinds, then, agreeable to the aforementioned rules, another sowing should be performed in three weeks or a month after ; but if you sowed in October or early in November, it is advisable to repeat the sowing in a fortnight or three weeks, for fear the first should fail ; and after this continue sowing once in three weeks or a month all winter in mild weather, the same kinds, not forgetting towards spring to sow a principal crop of the Reading and other large Hotspurs ; observing, as the season advances, the sowings may be in more open exposures, and more in quantity than the early sowings ; and as the spring draws on, the sowings should be repeated oftener ; as, for instance, from about Christmas till the beginning of March or April, it should be once in three weeks ; and from that time till May, once a fortnight will be necessary, especially as the warm weather increases, in which it will be particularly eligible. It must be observed, however, these frequent sowings are principally to be understood for practice in private gardens, for the supply of such families that require a daily succession of young Peas during the whole season ; but for large quantities in fields, where only a succession of general crops are required just during the principal Pea season, June, July, and August, three or four to five or six different sowings from November or December until March or April may be sufficient, as before intimated.

All the different sowings will come up regularly in successive order ; but the winter and spring sowings differ materially in the time they require to germinate and come up ; those sown any time in winter are sometimes three weeks, or near a month, before they come up ; but those sown towards spring come up sooner ; and March and April sowings will often rise in less than a fortnight, especially those sown in April ; and sometimes sowings performed in April and May will come up in a week.

In the above sowings may introduce some of the dwarf Peas any time from December, January, or February, in small or moderate portions till May or June ; and of which the Leadman's-Dwarf, before observed, is also very successful both for middle and late crops.

Any of the other Peas of the first class may also be sown as above for variety.

According as the plants of each sowing come up, and have advanced two or three inches high, it is proper to begin the first culture by drawing a little earth with a hoe, or small

rake, lightly up to their stems on each side of every row, to strengthen them and forward their growth ; repeating the earthing once or twice at proper intervals, more or less as occasion may require ; at the same time cutting down all advancing weeds : and when the plants are six or eight inches high, those you design for sticks should then be stuck.

But as the earliest crops, that come up in November or December, are often in danger from the severity of frosts, it is, therefore, proper, when the plants are about an inch or an inch and a half high, to draw a little fine earth lightly up to their stems, in a dry day ; likewise it will be of much advantage to give occasional protection to the earliest plants in severe weather, by covering them lightly with long, light, dry litter, of the straw kind, or with mats ; which, in private gardens, where there is but a moderate quantity in warm borders, might be more easily effected : this need only be practised in very rigorous frosts ; but be sure to uncover them every fine day in temperate weather ; and the moment the frost breaks, discontinue the covering entirely ; for they must by no means be kept too close, which would draw them up weak and tender ; but by a judicious protection, the crop is often preserved in tolerable condition, and forwarded much sooner to bearing than if it had been left entirely exposed ; observe, also, that according as the plants advance, repeat the earthing up a little at a time in dry mild weather, two or three times till spring ; it will protect them the better from frost, strengthen, and forward their growth : this is all they require during the winter. In spring hoe up all weeds, and give them a final earthing, an inch or two up their stalks ; and then, if intended to allow them sticks, let it be done when the plants are six or eight inches high : having branchy sticks of three or four feet length, stick a range of them along by each row of Peas, on the southerly side of each row ; the plants will readily catch hold, and gradually ascend by their tendrils, blossoming as they advance ; if, when in blossom, the weather should prove dry and warm, some good waterings in a morning will be beneficial culture ; and when the blossoming plants are advanced some considerable height, if they are then topped, it will promote the pods setting more expeditiously, and arriving sooner to perfection.

As to the other succeeding crops of the Hotspur and other kinds, all they require is hoeing up the earth to their stems, and cut up all weeds when they appear ; and those designed for sticks, should always be stuck as soon as they are half a foot high, or a little more, before

fore the plants begin to fall down to one side: providing sticks for this purpose, about four or five feet long, and place one range to each row of Peas: placing them principally on the south or most sunny side of the rows, because the plants naturally incline towards the sun, and thereby more readily attach themselves to the sticks.

Larger Kinds for successional and general Crops.—With respect to the larger kinds, such as the Marrowfats, Spanish Morattos, &c. we may begin sowing in January, the dwarf Marrowfats first; though February, March, and April, is a very eligible season for sowing the general crops of all the large kinds; observing to chuse a free exposure in the most open quarters, there drawing drills by line, about an inch and a half or two inches deep, and not less than a yard asunder; but if to be stuck, four feet, and for the largest sorts four feet and a half to five feet, in single or double rows, agreeable to former intimations: sow the seed thinly along the middle of each drill, and draw the earth evenly over them with the rake, hoe, or feet, covering them equally the depth of the drills, and rake the surface smooth. Repeat the sowings once a fortnight or three weeks; though as the spring and the warm season advance, once a fortnight will be proper, especially from the beginning of April until the end of May; or in May and June may sow a few once in ten or twelve days: late sowings, however, performed from the middle of May till about the middle of June are seldom very fruitful, being often attacked with the mildew; but in family gardens it is proper to endeavour to have some as long in the season as possible.

When the different crops of these are come up about three inches high, hoe up earth to them on each side of the row; and cut down all weeds, repeating the hoeing occasionally according as the growth of weeds shall require; and when they are half a foot, or eight or ten inches high, those you intend sticking should have the sticks placed to them: observing, these large sorts require sticks six or seven feet high at least, placing them on the sunny side of the rows, as we said for the Hotspurs.

Late Crops.—Any of the sorts, either Hotspurs or larger kinds, that are most approved of, may be continued sowing all May and until the middle or latter end of June; likewise in May and June, and beginning of July, may sow some of the dwarf Peas before mentioned for late production; and I would observe of the larger kinds of Peas of the second class, designed for late crops, it would be proper to sow a larger portion of the Rouncivals

for the latest crops of all, on account of their being rather the hardiest to struggle with the summer's heat and drought; and thereby generally most to be depended on for a late production, in any tolerable abundance: though Peas of any sort that are sown after May is out, are rarely so successful as the preceding crops, they being liable to be much retarded by the heat and drought of the season, and frequently attacked by the mildew, &c. it is, however, worth the trial, and if they bear but a few after the general season, they will be a rarity; observing generally, for late crops, to allot some of the moistest ground, especially where there is choice of soil and situation; and in sowing the later crops in May and June, if the weather should prove very dry and hot, it will be of importance to soak the Peas in soft water six or eight hours previous to sowing, otherwise water the drills well; either of which will promote their rising very expeditiously and more regularly together.

Other general Remarks relative to all the Sorts.

I have observed, in performing the different sowings of Peas, with respect to the intervals of time between the sowings, it was a good rule, in the different principal sorts, that as soon as one crop appeared fairly above ground, to sow another to succeed it, of the same kind, such as Hotspurs to succeed those of that class, and the same of the marrowfats, and other large sorts, whether in winter, spring, or summer; so continuing it to every crop, which will be found an infallible rule in sowing, so as to have a regular succession of crops following one another in bearing.

And if a crop of marrowfats, &c. and another of Hotspurs are sown on the same day, the Hotspurs will come into bearing a fortnight the soonest, and the marrowfats will arrive to a bearing state about the time the others are going out, just in due time to succeed them: mark this, therefore, when intended to have these sorts, form a regular succession to each other.

Such crops of Peas that you design to assist with sticks for support, should always have the sticks placed when the plants are from about six to eight or ten inches high, whilst they maintain their upright position of growth; and as at that height they begin to emit tendrils, they will very readily attach themselves to the sticks.

With regard to the sticks proper for sticking Peas, it is incumbent on us to procure such that are branchy, or furnished with many side shoots, and of proper length, according to the sorts of Peas they are intended to support;

port; they may be either the loppings of trees, or any bushy underwood that is well feathered with small lateral branches the whole length, for the plants to run upon; observing, that if for the Hotspur Peas, to prepare them about four or five feet long; but for the large kinds, six or seven feet length will be requisite, or more for the largest marrowfats, &c. trimming them all somewhat fan-fashion, so as the branches may spread only two ways, to range the way of the rows of the plants, and sharpen the lower end of each: being thus prepared, place one row of sticks to each line of Peas; which will be sufficient, especially if placed on the most sunny side of the rows, because the sun's influence will incline all the plants that way, and thereby more readily encounter with the sticks; placing the sticks about a foot asunder, or a little more or less, so as the branches of the different sticks meet; and as soon as one row is stuck, then with a hoe draw a little earth up to the opposite side of the rows of plants, to lay them towards the sticks: when the whole is stuck, if the tops of the sticks appear very straggling and very unequal, you may run over them with your knife or garden-shears, just topping them to some little regularity.

In gathering the product of Peas, both hands ought always to be employed, one to hold the peduncle, or foot stalk of the fruit, while the other pulls the pods, otherwise the stem or main stalk of the plant, being slender, fragile, and weak, would be liable to be broken.

The gatherings should always be regular; according as the pods fill, never let them stand to grow old, but gather them whilst young and green, as they are then in greatest perfection for eating, and the plants will continue longer in bearing.

A crop of Peas continues only about a fortnight in full bearing, during which time they will furnish a plentiful gathering of pods in their ultimate perfection; though in moist showery weather they sometimes continue shooting and flowering three or four weeks; but the produce after the first fortnight is generally inferior both in quantity and quality; hence the necessity of repeated sowings every three or four weeks.

As soon as any crops of Peas, that have been stuck, are past bearing, take up all the sticks, and tie them in bundles, and set them upright in any dry corner; they will serve another year.

Early Culture by Hot-beds.

By Hot-beds.—Where it is required to have a few green Peas as early in the year as possible, recourse is had to the assistance of hot-beds, as we before said, and the proper sort

of Peas for this purpose are the early dwarf kinds, which by this aid may be brought to bearing in March and April, and the following is the method.

It must be previously observed, that it is rather most eligible to raise the plants first in the natural ground, sown in October or November, having occasional protection from frost; and when one or two inches high, then transplant them into the hot-bed, in January or beginning of February; for by this practice the luxuriant growth of the plants is somewhat checked by removal, so as they will shoot moderately within due compass, and thereby will blossom and bear sooner and more abundantly.

In October or November, therefore, prepare to sow in a warm, dry, south border, or otherwise in some similar dry sheltered compartment of light good earth, formed into an oblong bed of proper dimensions to have protection of a frame, &c. in rigorous weather: then having some early dwarf peas, sow them in drills about a foot asunder, in the manner as for the common crops, when the plants are come up, and advanced a little in growth, then in a dry day draw some fine earth up to their stems, as you shall see occasion; observing, if the frost should set in severe, you must afford them protection, either of frames or coverings of mats, or else some long strawy litter; being careful, however, to expose them every favourable day; and they will thus be continued in free growth, and good strength for transplanting.

Or if omitted sowing as above, or when desirous to have some plants with greater certainty as soon as possible in the proper season for hot-bed planting, they may be forwarded by sowing the Peas in a moderate hot-bed in December or January, under Frames, &c. and when the plants are up, admit plenty of free air every temperate day, and defended of nights, and from frost, snow, and cutting cold;—or some sown in large pots, may be placed in a hot-house, &c. to bring up the plants quickly for transplanting into the intended hot-bed in January,—or sometimes Peas are sown at once in a hot-bed in December or January, finally to remain for bearing; but it would be generally more eligible to have the plants previously raised an inch or two high, either by early sowing in the full ground, or forwarded under frames, or in a hot-bed, &c. as above, for transplanting at once in a fresh-made final hot-bed, which will be the most successful for a prosperous earlier production.

Therefore, by either of the above methods of raising the plants for transplanting in the hot-bed culture, they, when advanced one or

two inches in growth, or but little more, are of proper size for transplanting into the allotted hot-bed finally to remain for fruiting.

Then in mild weather, towards the middle or latter end of January, or beginning of February at farthest, prepare a hot-bed for one or more of the large three-light frames and glasses; the hot-bed may be either of dung or tan; the latter where it can be obtained easily at a moderate expense, is considerably the best hot-bed for this purpose: however, of either of these materials make the hot-bed two feet and a half or a yard thick, and cover it with frames and lights, and when arrived to a moderate temperature of heat, put on the earth for the reception of the plants (see HOT-BEDS). Chuse any light good dry earth, and lay it eight or ten inches thick all over the bed; then in a dry mild day, take up the plants, raising them with their roots as entire as possible, with what earth will readily hang about the fibres; and drawing small drills in the earth of the hot-bed, from the back to the front of the frame, a foot and a half asunder, and about an inch deep, put in the plants in the drills, not more than an inch apart, covering in the earth close to their roots and stems, and give a very light watering, just to settle the earth; which done, put on the lights; being careful to raise them occasionally at the upper end to give vent to the steam, &c. observing at first planting, if in sunny days the plants should flag, give a moderate shade in the middle of the day till the plants have taken root.

After this you will admit fresh air to the plants daily in fine weather to strengthen them, by tilting the upper end of the lights according to the temperature of the bed and outward air; but keep them close in cold nights, and cover also with mats; give occasional moderate waterings in fine days; and as the plants advance in growth draw a little earth up to their stems once or twice; repeating the moderate refreshments of water frequently as the warm season advances; which may be given more freely when the plants are in bloom: observing according to the advanced growth of the plants and increased warmth of the weather, to give a larger share of fresh air in proportion; and when they are in blossom, observe if the sun at any time appears too violent for them through the glasses, it is advisable to give a very slight shade an hour or two in the heat of sunny days; likewise when in full blossom and fruiting, be sure to admit plenty of free air, even sometimes in fine days shove the glasses entirely off; still also continue the waterings more abundantly during the time of

setting and growth of the pods, and indulge them with the benefit of warm showers.

Thus the plants may be brought to bearing in March or April, and by a succession of two crops, in hot-beds made at three or four weeks interval, and managed as above; you may continue a supply till the natural ground crops come into bearing in May.

Sometimes for early forced Peas, where there is the accommodation of fruit forcing-houses, hot-walls, &c. of any sort in cultivation in January, &c. a few earliest kinds, either previously raised in young plants an inch or two in growth, as in the hot-bed culture, or in default thereof seed sown; and either of which being in pots, are placed in the said departments; or sometimes, where there are internal borders of earth, some young plants, as above, may be placed therein where room admits: the internal moderate heat of the above departments, effected either by bark-beds, &c. or fire, or both occasionally, in a requisite degree for forcing the fruit-trees to early production, will forward the Peas proportionally, as to have some for gathering in the most early season, in a small portion. The general heat of a pine-apple hot-house or stove, is rather too strong for the above occasion in early Peas.

Hints respecting the Culture in Fields.

In the field culture of Peas, where designed to raise crops in order to gather the produce green and young for the supply of markets, November, or rather December, is time enough to begin the first sowings, especially in open exposed grounds; choosing a dry light soil for the forward sowings.

As to the sorts of Peas, any of the Hotspurs for the forward crops, as observed in the garden culture, and for a general crop the Reading Hotspur is excellent; and secondary to that sort, the Master's and Ormrod's, &c. but of the large kinds, choose the marrowfats and Spanish morattoes for the main crops.

The ground for their reception is prepared by proper ploughing and harrowing; drills are then to be drawn with a hoe cross ways the lands, or if with a drill-plough lengthways, two feet at least, or two and a half asunder for the Hotspurs, and three for the larger sorts; no sticks being intended for these large field crops; and having sown the seed, cover them in either with a hoe or rake, though this is sometimes performed with a harrow; but the hoe or rake will cover them more evenly, and almost as expeditiously.

When the plants come up they must be kept clean from weeds, by broad-hoeing; but this is sometimes performed in fields by horse-hoe-

ing for the sake of expedition; which having hoes fixed in a sort of plough horizontally, is drawn by a horse between the rows, a man holding the plough-shafts to guide it; but as this can only cut down the weeds, a common drawing man-hoe must be used to earth up the plants; though this is often disregarded in the field-culture, it however proves very beneficial to the crop.

Saving Seed of all the Varieties.

To save seed Peas of the different varieties as perfect each in its kind as possible, some of each sort should be suffered to stand entirely for that purpose, or rather sow some of each purposely in different parts, and suffer the whole produce to remain and ripen for seed: this, however, in private gardens is rarely well attended to, for it is a very common practice to gather all the prime whilst young and green for the table, and let the gleanings remain for seed, which, although they will grow very well, and bear in tolerable plenty, yet the produce for the generality will be more scanty, smaller, and tend to degeneracy.

Observing, however, that when intended to raise a quantity purposely for seed, they should be sown in February in some open ground, in rows two or three feet asunder, no sticks being required, and when the plants come up, keep them clean from weeds by hoeing, and hoe the earth up to their stems once or twice.

When they are in bloom, examine them row by row, to see if there is any degenerate sort to pull it out, or if any improved variety is discovered, to mark it; which is the only method to preserve both the purity of the known sorts, and to procure new varieties; for example, if amongst the Hotspurs any large sorts appear, remove them directly; removing also any Hotspurs, &c. from amongst the large kinds, and different sorts of any of these from each other; and if any new sort discovers itself either by flowering earlier than all the rest, or possessing some other singularity, or noticeable merit for culture, it being carefully marked, the seed thereof may be saved separate, to sow also separate to furnish a proper increase.

According as the seeds of all sorts ripen in July and August, which is discoverable when the pods change brown, and the seed becomes a little hard, let the haulm be cut or pulled up in dry weather, and exposed in heaps in the sun, turning them every day; and when the seed is become perfectly dry and hard, it may either be threshed out directly, or stacked up in the dry till another opportunity; but whenever it is threshed, keep each sort

separate, and when properly cleaned, put them up also separate, in bags or sacks, with a label to each, expressing the variety.

PLANTATIONS, Plantations of trees, woods, &c.

Plantations of trees, &c. greatly embellish and improve estates, as well as ornament the adjacent country; and those formed into woods for timber-trees, prove not only very beneficial to the owners, but may be said to be a public convenience to the country around, to have the opportunity of purchasing wood in the neighbourhood, for the various purposes of buildings, fencings, making all sorts of husbandry implements, as carts, waggons, ploughs, &c. and for innumerable other uses; also for furnishing fuel, a very essential article.

In former ages this island abounded in natural plantations or forests, which spread themselves over the surface of the country, to a very considerable extent, and composed of various sorts of lofty trees of prodigious magnitude, all blended promiscuously together, and all of spontaneous growth. Those vast forests were never planted by any human hand, such only have been employed for ages in cutting them down, for in many places there were such a profusion of useless wood, that large tracts were obliged to be cleared by degrees in order to cultivate the ground for other purposes; which, together with the necessary demands for the timber from time to time for buildings, &c. and that owners of estates, reaping considerable advantage from the sale of their timber, continued by degrees, one generation after another, grubbing up their timber without measure; and few ever planted any in lieu of what they cut down; so that in many parts there is almost a general demolition of woodland, and many considerable estates have scarcely any timber of value left standing.

Every possessor of estates, either of large or moderate extent, will reap great pleasure and advantage in dedicating some share of his land to plantations; for in estates of whatsoever extent, they give grandeur and ornament to the premises, as well as an air of fertility and riches; and those large plantations designed for woods, will, after the first eight or ten years, bring in great profit by a gradual thinning of the underwood, besides leaving a sufficiency of standards to attain full growth: in the mean time the plantations in general will contribute exceedingly to the beauty of the estate; for how delightful it is for travellers to behold the noble plantations in groves, thickets, clumps, &c. variously disposed

in parks, and on the boundaries of spacious lawns, and the like places, formed of a great variety of beautiful trees and shrubs, and to see grand avenues of lofty growth, leading to or from a stately mansion, or some main road, or adjacent town; and in the out-grounds to observe the Plantations of woodlands, &c. ranging along the sides of hills, plains, and other grounds occasionally; but in estates how fertile soever the soil, yet it appears naked and barren without a proper share of Plantations; on the other hand, when estates are beautifully diversified with Plantations, the whole may be said to form a sort of pleasure-garden; especially as in the home-ward Plantations we may have commodious walks of gravel and sand, both private, shady, and sheltered, some straight, others disposed in varied winding turns in the serpentine way, bordered with hardy shrubs and flowers, which will afford most agreeable walking at almost any season of the year, as in summer they afford a screen from the vehement heat of the sun, and at other times shelter from boisterous winds, and cold piercing blasts; there may be also here and there recesses or places of retirement, leading by private turnings from the principal walks; with glades or openings of grass-ground in the midst of the most extended parts of the Plantations. See PLEASURE-GARDEN.

No land-holder, therefore, let the extent be almost ever so moderate or considerable, but ought to appropriate a proportionable share to commodious Plantations as soon as possible, either for ornament or emolument, or both, where the extent will admit, as there is hardly any estate that does not afford soil and situation proper for the cultivation of all our hardy trees, &c. and in many places, some estates often furnish particular soils improper for grass and corn, yet adapted to the growth of many sorts of trees, which would form good Plantations.

In short there is hardly any soil so barren and untractable but what will rear a growth of trees and shrubs of some species or other, both for ornament and advantage; and there is scarcely any kind of tree so bad but may be raised to one or other of those purposes: any very poor ground, or such that lie waste, or at a great distance, cannot be better improved than in Plantations; even although a tract of land should be so poor as to rear nothing but a crop of aspen trees, alder, and willows, yet the profits even of these productions will exceed what many may think.

So that there is a great number of examples to encourage, and warrant success in

Plantations, to reward the possessor not only with the pleasure of ornamenting his lands, and that of beholding their growth, but also with profit sufficient to compensate for the tract of land occupied, and labour in planting.

But to many persons, the necessary expense attending the making a Plantation, and knowing that they must wait several years before the trees have made any considerable progress, or can reap any advantage therefrom, often proves an obstacle in attempting the prosecution of that business; but as to the expense of planting, if you raise the plants in your own grounds, it will not prove near so great as many might imagine, especially as a small spot of seminary or nursery-ground will raise plants enough in three or four years to plant a great many acres of land, both ornamental and woodland; and by the latter, the expense of raising and planting them, together with the loss of time in waiting a few years till the plants attain some growth, will be compensated by the first fall or thinning of the underwood, in eight or ten years after planting; and the stools or roots remaining shoot up again, in many of the deciduous kinds, and afford a lopping every eight or ten years, exclusive of the due portion of standards left at proper distances, to attain full growth for timber, as aforesaid.

One particular precaution in making Plantations, is the judicious choice of such trees as are the best adapted to the nature of particular soils, which may vary exceedingly in estates of great extent; however, such trees as we find daily growing by road-sides, hedge-rows, and in any adjacent grounds, are rough sketches of what the land will produce.

As to the sorts of trees and shrubs proper for Plantations in general, there is a vast variety, both of the deciduous and ever-green tribes, that will prosper in the open ground in any common soil. See DECIDUOUS and EVERGREEN TREES, &c.

It is of importance, in making any considerable Plantation, to choose principally young plants, of from about two or three to five or ten feet stature, which always prove more successful than older trees; for although some persons, being in haste to have Plantations as forward as possible in a few years, transplant tall trees, perhaps twelve or fifteen feet high or more, particularly for ornamental Plantations; yet younger growth always take root sooner, and more firmly establish themselves, so as to form considerably the finest Plantations at last, and be of longest duration; for although large trees of fifteen to twenty feet height, especially of the deciduous kind, may with care

be transplanted, so as to grow, and probably thrive tolerably for some years, yet trees more than ten, twelve, or fifteen feet high, often fail, by not rooting firmly like young plants, and after some years standing, have hardly made any shoots, and at last gradually dwindle and perish; therefore large trees should never be employed for Plantations only on particular occasions, where a few may be necessary to form an immediate shade or blind, &c. in some particular place; but for general work, be persuaded to employ chiefly young plants, either of your own raising, or purchased from the nurseries. And for principal timber Plantations in particular, I would choose such plants as are only from about two or three, to five or six feet in height, or eight or ten at most; generally having those of the same Plantation, nearly of equal growth. See PLANTING.

All the different sorts of trees and shrubs proper both for ornamental and timber Plantations, may be had at all the public nurseries moderately reasonable; though persons accommodated with scope of ground, may easily raise many sorts for their own private use, by the methods directed under the respective genera: a small nursery will raise trees and shrubs enough to plant many acres of land. See NURSERY.

Observe, that where Plantations are intended principally for ornament, as great a variety as possible of the different sorts of hardy trees and shrubs should be employed, to afford the greater source of entertainment; and should consist both of lofty and middling trees, down to the humblest shrub. See DECIDUOUS and EVER-GREEN TREES. Disposing the deciduous and ever-green plants principally in separate compartments; sometimes arranging the tree-kinds by themselves, some in running varying Plantations, towards the boundaries of spacious lawns, parks, paddocks, &c. others in avenues, groves, thickets, and clumps, as aforesaid, variously disposed in different parts; and sometimes arranging the trees and shrubs together, in forming shrubberies, wilderness, shady walks, and wood-works; placing the taller growth backward, and the lower in front; bordering the whole with the most beautiful flowering shrubs, and showy ever-greens, especially next the principal walks and lawns; observing to vary the form of all the several compartments, sometimes by moderate sweeps and curves outward and inward, of different dimensions, other parts in long easy bends, varied projections and breaks, so as to diversify the scene in some imitation of natural Plantations. Allow proper distances, in planting, which may be from

five or ten to fifteen or twenty feet; for example, the tall trees designed for continued Plantations may be from ten to fifteen or twenty feet, varying the distance in different parts, according as light and shade, &c. may be proper; and those in groves, may, if open groves, be fifteen or twenty feet distance, and close groves ten or twelve; for thickets, five or six feet, or closer in particular places where a very dark shade, or thick coverture of wood is required; and in clumps of trees, may allow from five or ten to twenty feet between the trees in each clump, varying the distance occasionally, as also the sorts and numbers of trees in each, from two or three, to five, ten, or more; likewise the form of the clumps; some may be triangular, others quadrangular, pentagonal, &c. and some in curves, others in straight lines, to cause the greater variety. And as to the shrubby clumps, and wilderness compartments, where the trees and shrubs are employed promiscuously together, they may be planted from five to ten feet distance; the taller growth being placed backward eight or ten feet asunder, placing the lower plants gradually forward according to their gradation of stature, to the lowest in front, as above observed, at four or five feet distance: and if the trees and shrubs of the plantations in general are disposed somewhat in the quincunx way, they will appear to the greater advantage.

But when designed to form large Plantations into woods, &c. composed principally of forest and timber-trees for profit, particular sorts must be chosen, consisting both of deciduous and ever-green trees. Of the deciduous kinds choosing the oak, elm, ash, beech, chestnut, hornbeam, birch, alder, maple, sycamore, plane-tree, poplar, lime-tree, walnut-tree, wild cherry-tree, mountain-ash, larch-tree, willow-tree, hazel tree, &c. and of the evergreens, the pine-trees, firs, cedar of Lebanon, holly-tree, bay-tree, laurel-tree, yew-tree, ever-green oak, box tree, and some others. See FOREST TREES. The particular description and culture of all of which sorts, deciduous and ever-greens, are exhibited in their proper genera. They are all hardy, and will grow in almost any common soil, rich or poor, and mostly also in dry or moist ground, high or low; allotting, however, particular sorts to very low marshy soils, such as the willow, fallow and osier, poplar, alder, and other aquatics, which will prosper in places that are in a manner covered with water, and are the most proper sorts for the embellishing and improvement of such grounds: all the other sorts will succeed in any

any other more upland places out of water; observing, with respect to disposition, the deciduous and ever-greens should generally be separate, as observed for the ornamental Plantations. But the trees of the same tribe may sometimes be intermixed, and sometimes different sorts in separate divisions or quarters, as oaks in one, elms in another, &c. remarking likewise in timber Plantations, that all the trees should be planted pretty close together, i. e. not more than three, to four or five feet distance, in order that they may mutually draw each other up tall, more expeditiously, and to allow for a gradual thinning, as hereafter directed.

In forming woods, however, or Plantations of timber-trees, the following hints in respect to planting them are proper to be observed.

Let it therefore be remarked, that there are two methods practised in forming Plantations of woodlands; one is by raising the trees from seed at once on the ground where the Plantation is intended to be, especially of the deciduous kind, and is effected by sowing the seed in drills, a yard asunder, and the plants always to remain where raised, thinning them gradually: the other method is by previously raising the plants in a nursery, till two or three feet high, then transplanting them into places allotted them, in rows the above distance, to allow also for gradually thinning.

Either of these two methods may be practised, as shall seem most convenient to the owner; but the former, i. e. raising the plants where they are to remain, that although it may be more expeditious, and that at once to get rid of the troubles of transplantation, yet they will require greater attendance for a few years, till the plants have shot up out of the way of weeds; but on the other hand, the trees always remaining where raised, not disturbed by removal, they probably may make the greater progress. The latter method, however, of raising the trees first in a nursery, is rather the most commonly practised, as being thought the least troublesome and expensive, with regard to the attendance at first of the young growth. However, every one is at liberty to make the experiment as it suits his convenience.

The preparation of the ground for the final reception of the seed or plants of these Plantations, is by deep ploughing and harrowing, upon such ground where the plough can be employed; where this, however, or any other tillage is not practicable, we must decline sowing seed, and use only young plants from the nursery, digging holes, &c. at proper distances, one for the reception of each plant: where, how-

ever, the ground can be tilled, it will prove very advantageous, performing it previously a year before; sowing it with a crop of turneps, or the like: when these come off, well plough and harrow the ground again, for the reception either of the seed or plants the ensuing season.

The most proper season to perform this planting, either by seed or plants, is any time in dry mild weather, from October or November till February, though November and February are rather the most eligible for most kinds of hardy tree seeds: however, where large tracts are to be planted, both methods must be pursued all winter, at every favourable opportunity.

If seed is intended, you must be well provided with seeds of the several deciduous trees in particular, which may be obtained at many of the nurseries and principal seed-shops; then, for its reception, draw furrows or drills one to two or three inches deep; and three or four feet asunder, scatter the seed along the middle of the drills, and cover the earth evenly over them, the depth of the drills or furrows; though sometimes seeds are scattered or sown promiscuously over the general surface, and harrowed into the ground; observing, in general, to place scare-crows and traps to guard against the insults of birds and vermin.

But if designed to form the Plantation with young plants, previously raised in beds in the nursery by the common method, let the following practice be observed: choose always young plants, only from two or three to five or ten feet high; and if very large Plantations are intended, you may, to save time and trouble, take the plants immediately from the seed-bed, when one or two feet high, without giving them any previous transplantation in the nursery; though, where the Plantations are but moderate, it is most eligible to plant them out previously in nursery-rows, to have two or three years growth: but for remarkable large Plantations, this would be a very great trouble and expense. Being, however, furnished with young plants, they are to be planted in rows, three or four feet asunder, as directed for the seed, and one or two feet apart in the lines; they may be planted either by opening small apertures or holes with the spade for each plant; or, if very small plants, it is sometimes performed by making only a slit or crevice with the spade for each plant; and sometimes by opening or forming small trenches the whole length, then one interts the plants whilst another trims in the earth about their roots: some again, in very large tracts, where the situation admits of previous ploughing

ploughing and harrowing to divide and break the earth into small particles, open furrows with a plough, two or more persons being employed in depositing the trees in the furrow, whilst the plough following immediately with another furrow, covers the roots of the plants with the earth thereof, and afterwards treading each row upright. See PLANTING.

The ground where the above Plantations are made should be previously fenced all round with a deep ditch, &c. to guard against the encroachments of cattle.

Whilst these plantations are young, they must have some attendance to destroy weeds, which may be expeditiously executed by hoeing between the rows in dry weather, or occasionally by horse-hoeing; and this care will be needful for two or three years, especially the seedling Plantations, till the trees are advanced out of the reach of weeds; after which no farther trouble will be required until the trees are ready for the first fall or thinning, for poles, faggots, &c.

In eight or ten years growth, they will be of a proper size to begin the first fall by a moderate thinning, which will serve for poles and faggot-wood, to pay towards the expense of planting, &c. but begin lopping only part of the plantation the first year; thinning out the weakest and most unpromising growth first; leaving a sufficiency of the most vigorous plants pretty close, to grow up for larger purposes; the year following begin thinning another part, and so continue an annual thinning-fall till got through the whole Plantation; cutting each fall down near the ground, leaving the stools to shoot out again, especially of the deciduous kinds, and by that time you have made the last fall, the first will have shot up, and ready to be cut again; so the returns of fallings may be contrived to be every six, seven, eight, or ten years, or more, according to the uses the poles or wood are wanted for: and if larger poles, &c. are wanted, the fall may be only once in fourteen, eighteen, or twenty years, still, at every fall, being careful always to leave enough of the most thriving plants for final standards; leaving them pretty close at first, that they may mutually draw each other up in height; but may be thinned every succeeding fall as they increase in bulk and meet, so as to leave a sufficient quantity of the principal trees at proper distances to grow up to timber, which in their turn, as they become fit for the purposes intended, may also be felled according as there may be a demand for them to the most advantage; having young ones from the stools

coming up in proper succession as substitutes, so as the ground may be always occupied.

PLANTING. Planting is the work of inserting plants, seeds, and roots, in the earth, for the purpose of vegetation.

There are various methods of Planting in practice for different sorts of plants, seeds, and roots; such as hole Planting—trench Planting—trenching-in Planting—slit or crevice Planting—holing-in Planting—drill Planting—bedding-in Planting—furrow Planting—dibble Planting—trowel Planting—Planting with balls of earth about the root—Planting in pots, &c. all of which methods of Planting are occasionally used by different practitioners in the several branches of gardening, according as the several methods shall seem most eligible for different or particular sorts of plants. Observing that although most of the different operations are hinted in many different parts of this work in the culture of the various species of each genus, we nevertheless judge it expedient under this head, to exhibit some general directions of the manner each method is performed; together with some hints of the kinds of plants, &c. that are commonly planted by the different methods, which may prove useful to young practitioners in performing the mechanical operations of Planting.

1. *Hole Planting.*—This is the principal method practised in the final Planting of all sorts of trees and shrubs in the full ground, by opening with a spade round holes in the ground, at certain distances, one for the reception of each plant. Each hole should be digged capacious enough to admit all the roots of the tree or shrub freely every way to their full spread, without touching the sides of the hole, and about one spade deep, or a little more or less, or according to the size of the roots, so as, when planted, the uppermost ones may be only about three or four inches below the common surface, or about as low as they were before in the ground, which is discoverable by examining the bottom of the stem of the tree; though in very humid soils, where the water is apt to stand, the holes should rather be shallow, so as the uppermost roots may stand full as high as the general level, or higher if it shall seem necessary, raising the ground about them, especially in winter Planting: let the holes, however, be of a proper width and depth, according to the above rules, loosening the bottom well; and if too deep, it is easily remedied in the time of Planting, by shaking up the tree as you shall see occasion; observing in digging out each hole, to lay

lay the earth in a heap close to the edge, in order to be ready to fill in again: the holes being ready, then having trimmed the roots, &c. of the trees, as hereafter directed, place one tree in the middle of the hole, making all its roots spread equally around; a person holding the plant erect by the stem, whilst another with his spade casts in the earth about the roots, taking particular care to break all large clods, and trim in some of the finest mould first all round about the roots in general, shaking the tree occasionally, to cause the fine soil to fall in close among all the small roots and fibres; at the same time if the tree stands too deep, shake it up gently to the proper height, and having filled in the earth to the top of the hole, tread it gently all round, first round the outside to settle the earth close to the extreme roots, continuing the treading gradually towards the stem, to which tread the mould moderately firm, but no-where too hard, only just to settle the earth, and steady the plant in an upright position: then pare in all the remaining earth evenly round the tree, to the width of the hole, raising it somewhat above the general level of the ground, to allow for settling, giving it also a gentle tread, and finish it off a little hollow at top, basin-like, the better to receive and retain the moisture from rains, and occasional waterings in spring and summer, particularly to the choicer kinds of trees and shrubs.

After performing this Planting, if in winter, or late in spring, it may be of advantage to the choicer kinds of trees and shrubs to mulch them, i. e. to lay some long mulch at top of all the earth, both to keep out the winter's frost, and prevent the drying winds and drought of spring and summer from penetrating to the roots before the trees are well rooted in their new quarters (see MULCH). But some, instead of mulch, use grass turfs, turned topsy-turvy, especially when planting upon any grass ground, or any out-plantations where turfs of grass can be obtained; or in orchards, where the ground is grass; in which case it may be proper to bank some turfs round the sides and top of each hole, particularly for large trees; which will steady them more effectually, as well as preserve the moisture, if much dry weather should happen the succeeding summer.

The above work, however, of mulching or turving new-planted trees, is not absolutely necessary to our common hardy kinds of fruit-trees, forest-trees, and shrubs; though it may prove beneficial to all sorts, but more particularly to the more tender kinds of wall fruit-

trees, and more delicate sorts of flowering shrubs, choice ever-greens, and some kinds of herbaceous perennials.

2. *Trench Planting.*]—This method is sometimes practised in the nursery-way, in putting out seedling and other small trees and shrubs in rows; is also used for Planting box-edgings; sometimes likewise for Planting small hedge-sets, &c. and always in Planting *Asparagus*; and is performed by opening a long narrow trench with a spade, making one side upright, so place the plants against the upright side, and turn the earth in upon their roots.

If for young seedlings, or other small trees and shrubs, &c. the ground is previously trenched or digged; a line is then set, and with a spade held with its back towards the line, cut out a narrow trench, six or eight inches deep, turning the earth from the line, making the line-side nearly perpendicular; the plants are then inserted in the trench at small distances, close to the upright side, covering in the earth about the roots as you proceed in planting them; and having planted one row, tread the earth evenly all the way along, to settle it close, and fix the plants steady; and so proceed row and row.

But in planting larger trees in the nursery way by *Trench Planting*, a more capacious trench will be requisite; sometimes a trench one or two spades wide, with proportionable depth, according as the roots of the trees shall require; so having opened it all the way along the intended row, proceed to place the trees along the middle of the trench, filling in some earth to each tree as you place it, one person holding it erect whilst another throws in the earth; and having placed one row, trim in all the remaining earth evenly; then tread it closely all the way, to fix the plants steady and perfectly upright.

3. *Trenching-in Planting.*]—This is also sometimes practised in light pliable-working ground, for Planting young trees in the nursery-way, and sometimes in Planting hedge-sets, &c. and is performed by digging along by a line, about one spade wide, and Planting as you go on. The method is this: a line is set, then having the plants ready, and with your spade beginning at one end, and standing side-ways to the line, throw out a spit or two of earth, which forming a small aperture, another person being ready with the plants, he directly deposits one in the opening, whilst the digger proceeds with the digging one spade wide, covers the roots of the plants with the earth of the next spit; and another aperture being

being thereby also formed, place therein another plant; the digger still proceeding, covers its roots, as before, with the next spit of earth; and so on to the end of the row, placing them at about a foot, or fifteen or eighteen inches asunder, according to the size of the plants; observing, when Planting larger trees with more spreading roots, by this method, that instead of digging the trench only one spade wide, two may probably be requisite for the proper reception of the roots; likewise in forming the opening for each plant, make it capacious enough to receive the roots freely, digging the earth over them as above. After having planted one row, either small or large plants, tread the earth evenly along to settle it to the roots, and steady the plants all equally upright.

Another method of *Trenching-in Planting* is sometimes used for Planting some sorts of roots, such as horse-radish-sets, potatoes, &c. performed by common trenching, placing a row of sets in each trench. The horse-radish should be planted in the bottom of the open trench, this being twelve inches depth, turning the earth of the next over them; and the potatoe-sets place about four to five, or six inches deep, and cover them also with the earth of the next trench; but this method of planting potatoes is only practised occasionally. See *COCHLEARIA Armoracia*, and *SOLANUM tuberosum*.

4. *Slit Planting*.]—This method is performed by making slits or crevices with a spade in the ground, at particular distances for the reception of small trees and shrub plants. A slit being made for each plant, which is inserted as you go on; and is practised sometimes in the nursery-way, &c. in putting out rows of small plants, suckers, &c. at from about a foot to eighteen inches or two feet high, and that have but small roots: it is also sometimes practised for final Planting in out-grounds, where very large tracts of forest-trees are intended, and that they are to be planted out at the above sizes, and by the most expeditious and cheapest method of Planting; the following is the method.

A line is set, or a mark made accordingly; then having a quantity of plants ready, for they must be planted as you proceed in making the slits; a man therefore having a good clean spade, he strikes it into the ground with its back close to the line or mark, forms a crevice, taking it out again directly, so as to leave the slit open, gives another stroke at right angles with the first, then the person with the plants inserts one immediately into the second-made crevice, bringing it up close

to the first, and directly press the earth close to the plant with the foot; proceed in the same manner to insert another plant; and so on till all is finished: which is a very expeditious way of putting out small plants, for any considerable plantation. See *PLANTATIONS*.

A man and a boy by this method will plant ten or fifteen hundred, or more, in a day.

5. *Holing-in Planting*.]—This is sometimes used in the nursery-way in light loose ground; also sometimes in Planting potatoes, &c. in pliable soils.

The ground being previously digged or trenched, and a line placed, they proceed thus: a person with his spade takes out a small spit of earth, to form a little aperture, in which another person directly deposits a plant, &c. the digger at the same time taking another spit at a little distance, turns the earth thereof into the first hole over the roots; placing directly another plant in this second opening, the digger covers it with the earth of a third, and so on to the end of the row.

6. *Drill Planting*.]—This is by drawing drills with an hoe from two to four or five inches deep, for the reception of seeds and roots, and is a commodious method of Planting many sorts of large seeds, such as walnuts, chestnuts, and the like; sometimes also broad beans, but always for kidney-beans, and peas; likewise for Planting many sorts of bulbous roots, when to be deposited in beds by themselves.

The drills for all of which purposes should be drawn with a common hoe, two or three inches deep (see *HOE* and *DRILL-SOWING*): though, for large kinds of bulbous roots, four or five inches depth will be requisite, covering in the seeds and roots with the earth, always the depth of the drills.

7. *Bedding-in Planting*.]—This is frequently practised for Planting the choicer kinds of flowering bulbs, such as *Hyacinths*, &c. also for larger seeds of trees, as acorns, large nuts, and other larger kinds of seeds, stones, and kernels, and is performed by drawing the earth from off the tops of the beds some inches depth, then planting the seeds or roots, and covering them over with the earth, drawn off for that purpose. The following is the particular method.

The ground must be previously digged or trenched, raked, and formed into beds three or four feet wide, with alleys between bed and bed; then with a rake or spade trim the earth evenly from off the top of the bed into the alleys, from two or three to four inches deep for bulbous roots, and for seeds, one or two, according to what they are, and their

size; then, if for bulbous roots, draw lines along the surface of the bed, nine inches distance, place the roots bottom downward, along the lines, six or eight inches apart, thrusting the bottom into the earth: but, if seeds, they may be scattered promiscuously; and having thus planted one bed, then with the spade, let the earth that was drawn off into the alley, be spread evenly upon the bed again over the roots or seed, &c. being careful that they are covered all equally the above depth, and rake the surface smooth.

This method is in occasional practice, in planting several kinds of the larger prime sorts of bulbous-rooted flowers in beds.

The nurserymen also practise this method in Planting many of their larger seeds, nuts, &c.

Another method of *Bedding-in Planting*, occasionally practised in some parts, particularly for planting potatoes in low wet grounds, is by dividing the ground into beds, four feet wide, with alleys two or three feet wide between bed and bed; then digging the beds, place the potatoe-sets in three rows along each bed, a foot asunder in the row; this done, dig the alleys one spade, casting the soil upon the beds over the sets, so as to cover them four or five inches deep: thus, if the ground is very wet, the alleys will drain the moisture from the beds, so as sometimes to afford very great crops.

Sometimes, in the above method, it is practised in low moist grounds, that are in grass sward; so marking out beds as above, and without digging the ground, placing the potatoe sets immediately upon the sward, then digging the alleys, first turn up the sward, and place this topsy-turvy upon the bed, sward to sward over the sets; and then finish by applying more earth from the alleys, to cover in the sets, the proper depth of four or five inches. This method, in some counties, is called planting in lazy-beds, because the ground is not digged; and often is productive of great crops of large potatoes.

8. *Furrow Planting.*]—This is by drawing furrows with a plough, and depositing sets or plants in the furrow, covering them in also with the plough; and is sometimes practised for planting potatoe-sets in fields, and has been been practised in planting young trees for large tracts of forest-tree plantations, where the cheapest and most expeditious method is required; but this method can be practised only in a light pliable ground, and is performed thus; a furrow being drawn, one or two persons are employed in placing the sets or plants in the furrow, whilst the plough

following immediately with another furrow, turns the earth thereof in upon the roots of the plants.

We do not, however, recommend this method of Planting for general culture; only persons that have scope of ground may try the experiment.

9. *Dibble Planting.*] This is the most commodious method for Planting most sorts of fibrous-rooted seedling plants, particularly all the herbaceous tribe; also for planting slips, off-sets, and cuttings both of herbaceous and shrubby kinds; likewise for some kinds of seeds and roots, such as broad-beans, potatoe-sets, Jerusalem artichokes, and horse-radish-sets, with numerous sorts of bulbous roots, &c. and is expeditiously performed with a dibble or setting-stick, therewith making a narrow hole in the earth for each plant, inserting one in each hole, always as you go on; observe the following hints.

Having a dibble or setting-stick, it is used by thrusting it into the earth in a perpendicular descent, in depth as the particular plants, &c. may require; directly inserting the plant, seed, or set, according as each hole is made, closing the hole immediately by a stroke of the dibble. So proceed dibbling the holes and Planting as you go on, at particular distances and depths, according to the nature of the Plants, &c. as exhibited in their respective genera: observing, in setting any kind of plants, slips, cuttings, and the like, having long shanks or stems, it is proper to make holes a proportionable depth, to admit them some considerable way in the ground; for example, cabbage-plants, savoys, &c. should be planted down to their leaves; slips and cuttings should be inserted two parts of three, at least, in the ground; being particularly careful in dibbling-in all sorts of plants, to close the holes well in every part about the roots, by striking the dibble slantways into the ground, so as to strike the mould first firmly up to the root and fibres, at the same time bringing it close to the stem; for in dibble Planting, many inadvertently only strike the earth about the neck of the plant, and the lower part of the hole is often left hollow about the roots; but by striking the dibble first at the root-part, you fix the plant effectually, then a stroke of the dibble at the top of the ground finishes, by closing up every part of the aperture. In this manner continue planting and finishing each hole as you go on, perfectly close, that neither the sun, air, nor penetrating winds can enter, this being of much importance; but often disregarded, as we may often see the holes that are necessarily made in fixing the plants, left

open, which may be easily closed as they go on, with the utmost facility, each hole at the insertion of its plant, at one stroke of the dibble, as above said.

For the sorts of dibble, and some other particulars in dibble Planting, see DIBBLE.

10. *Trowel Planting.*]—This is performed with a garden-trowel, which being made hollow like a scoop, is useful in transplanting many sorts of young fibrous-rooted plants with balls of earth about their roots, so as they may not feel their removal. See *Planting with Balls of earth, &c.*

The trowel is employed both in taking up the Plants, and planting them; observing the plants having been previously pricked out from the seed-bed or elsewhere, at certain distances, and having been of some standing for their roots to have got good hold of the ground, they, by aid of the trowel, may be readily taken up, each with a good ball of earth about all its roots; and then with the trowel making a hole for its reception in the allotted place, insert it in the hole with the whole ball of earth entire, earthing it in properly, and give a little water: thus the plants will scarcely feel their removal, and often continue their growth without loss of time, as if they had not been transplanted at all.

11. *Planting with Balls of Earth about the Roots.*]—This is the removing a plant with a large ball of earth about its roots, so as the plant by having its roots firmly attached to the surrounding ball of earth, it still, during the operation, continues its growing-state, as it were, without receiving any, or but very little check from its removal; and is often practised more particularly to the more delicate and choicer kinds of exotics, both trees, shrubs, and herbaceous plants: and is occasionally practised to many of the fibrous-rooted, flowery plants, both annuals, perennials, and biennials, even in their advanced growth and flowering state, when particularly wanted to supply any deficient compartments; though not so eligibly in bulbous-rooted kinds: likewise, when intended to remove any sort of tree or plant out of the proper Planting season, as very late in spring, or in summer, it is eligible to transplant it with a good ball of earth to preserve it more certainly in a state of growth. Observing, some trees and shrubs are more difficult to remove with a ball than most kinds of herbaceous fibrous-rooted plants, though many of the tree and shrub kinds, having very fibry roots, will also readily rise with good balls.

However, in transplanting any of the tree

and shrub kind by this method, if they grow in the full ground, we must be careful to begin to open a trench with a spade at some considerable distance from and round the stem, perhaps a foot, or two or three, according to the size of the tree and expansion of the roots, digging a sort of trench all round, a spade or two wide, or more if large trees, and in depth below all the roots; all the time having great care not to disturb the ball or mass of earth between the stem and trench, but preserve it as entire as possible; for if we loosen this part about the roots, the intended effect of still preserving the tree in a growing state, will fail. Having, however, dug down below the roots all round, you must then undermine the ball on every side, below all the roots, till the whole ball is detached from the main ground; then remove the tree with its entire ball carefully to its destined place, having a capacious hole ready opened, if for the full ground; or if for pots, have such that are some inches wider than the ball, to admit of a portion of fresh earth all round; in either method, however, plant the tree or shrub with its whole ball entire, and fill in the earth evenly all round it, pressing it gently down, and give a moderate watering round the outside, to settle the earth close to every side of the ball; then place a stake for support.

But when trees or shrubs, with balls to their roots, are intended to be sent to any considerable distance, they should be placed singly in osier baskets, in order to preserve the cohesion of the ball; having a basket for each tree; the baskets to be of an upright make, in width and depth in proportion to the ball, with two handles at top, especially if large baskets; and all generally worked rather open at the sides, because sometimes the basket and all is placed in the ground, when the plant cannot be readily removed without danger of breaking the ball of earth; so that the sides being a little open, the roots may have liberty to shoot out; most basket-makers know how to make them. Having, however, the baskets, put a little good earth in the bottom of each, then place the plant with its ball, fixing it properly in an upright position, observing likewise, in their carriage to the allotted places, to preserve them in an upright posture. In Planting them, if they cannot be readily moved out of the baskets without disturbing the ball of earth, plant basket and all, as aforesaid; cut it here and there in the sides, and throw some fine mould close all round so as to join with that of the ball, and give a watering to settle it more effectually close: the roots and fibres will readily make their way

way through the sides of the basket; besides the baskets will soon rot, without proving any obstruction to the growth of the plants.

But sometimes, instead of baskets, smaller young trees and other plants with balls, intended to be sent to any distance, are placed in pots, one plant in a pot, and if they are to be placed in the full ground, turn each out of the pot with the ball entire; or, if it seemingly will not readily quit the pot without separating, break the pot, to preserve the cohesion of the ball.

Many sorts of herbaceous fibrous-rooted plants, however, may readily be taken up with balls with very little trouble, by reason of their numerous fibres, to which the earth closely adheres in a compact lump all round the root; and with a spade or trowel may often be taken up with balls with the utmost facility, and in some sorts the earth of the ball will cling so close as to admit of being sent to some distance without being potted; others again, being less fibrous, require the assistance of a pot to preserve the ball entire till arrived at its place of destination.

And as to trees and other plants that have generally grown in pots, the transplanting them with balls is very easy, for if they have been of some standing in the pot, the whole earth thereof will, by means of the numerous fibres, be formed into one compact lump, as it were, that it will readily come out entire and firm; or to such as do not so easily quit the pot, thrust a long blade of a knife, or some other thin instrument, down between the outside of the ball and pot all round, it will then readily come out, either in drawing by the stem of the plant, or by striking the edge of the pot with something; or, if small plants, may turn the pot mouth downward, and strike the edge gently against any thing of firm substance: observe, in replanting those potted plants, that if the sides of the ball of earth is much matted with the fibres of the root, it is proper to pare off the grossest part, together with a little of the old earth, especially if to be planted in pots again; then planting it in a pot a size larger than before, filling up all round with fresh mould, and finish with a moderate watering. See *Planting in pots*, below.

The advantage in Planting with balls, either in the full ground, or in pots, is, the root of the plant being inclosed in the ball of earth, continues all the while drawing nourishment, and the growth of the plant is not retarded in waiting till it has taken fresh root in its new place, which may be of advantage

in many cases, particularly all tender plants, some of our choicest ever-greens, and many kinds of herbaceous flower plants.

But Planting with balls is not recommended for general practice, for in all the hardy tree and shrub kind it would be needless as well as very expensive and troublesome, and in which is only necessary on particular occasions, as before explained.

12. *Planting in pots.*]—This is practised to all tender exotics, in order for moving them to shelter occasionally, such as all kinds of green-house and hot-house plants; and it is likewise practised for many sorts of hardy flowering-plants, for the convenience of moving them occasionally to adorn any particular compartments; and for the convenience of moving some curious sorts when in flower to occasional shelter from the sun's rays, and excessive rains, in order to preserve their beauty and prolong the time of their bloom; such as the fine auriculas, carnations, &c.

In Planting in pots, it is highly requisite carefully to adapt the sizes to the size and nature of the different plants intended to be potted; if small plants, begin first with small pots, one plant only to each pot, especially if to remain; but according as the different plants advance in growth, shift them into pots one or two sizes larger, which may be requisite to many sorts once a year, to others once in two or three years, according to the nature and increased growth of the respective plants: though to some sort of tender annuals it may be necessary once or twice in the course of a season, when forwarding them by hot-beds: all of which is generally particularised in the culture of the various sorts. And by thus beginning first with small pots adapted to the size of the plants, it is not only cheaper and more commodious for moving and stowing them in different parts occasionally, till they gradually advance in growth, but by thus shifting them into pots a size larger, it admits of adding fresh earth, which proves highly beneficial to their growth.

Garden pots for the reception of plants are of several regular sizes, from two to sixty in a cast, so are distinguished at the pot-houses accordingly, as twos, sixes, twelves, sixteens, twenty-fours, thirty-twos, forty-eights, sixties, or sixty-fours, &c. in each cast; each pot having one or more apertures at bottom to discharge the superfluous moisture. They are sold by the potters at so much per cast, large and small, all of a price; those of only two in a cast the same as those of sixty; and from two shillings to half a crown or three shillings per cast is the general price. See *Pots*.

But

But with respect to the particular method of Planting in pots in general, the following particulars are necessary to be observed.

Having the pots and mould ready for the reception of the intended plants, observe, previous to planting them, to place some pieces of tile, potshards, or oyster-shell, &c. over each hole at the bottom of the pots, both to prevent the holes being clogged and stopped with the earth, and the earth from being washed out with occasional watering; also to prevent the roots of the plants getting out; then having secured the holes, put some earth in the bottom of each pot, from two or three to five or six inches or more in depth, according to the size of the pot, and that of the roots of the plant; this done, insert the plant in the middle of the pot upon the earth, in an upright position, making its roots, if without a ball of earth, spread equally every way; directly adding a quantity of fine mould about all the roots and fibres, shaking the pot to cause the earth to settle close thereto; at the same time, if the root stand too low, shake it gently up as you shall see occasion; and, having filled the pot with earth, press it gently all round with the hand, to settle it moderately firm in every part, and to steady the upright posture of the plant; raising the earth however within about half an inch, or less, of the top of the pot, it will settle lower; for some void space at top is necessary to receive waterings occasionally: as soon as the plant is thus potted, give directly a moderate watering to settle the earth more effectually close about all the roots, and promote their rooting more expeditiously in the new earth; repeating the waterings both before and after they have taken root, as occasion requires.

In transplanting plants in pots from one pot to another, they may for the general be shifted with the whole ball of earth contained in the pot about their roots entire, so as to preserve the plant all along in its growing state, as scarcely to shrink or retard its growth by the operation of removal; which to plants growing singly in pots, and of some standing, whose roots and fibres have established themselves firmly in the earth, they will readily remove out of the pots with the entire ball in one compact lump, surrounding all the roots and fibres, retaining their growing state by still drawing nourishment from the surrounding ball of earth.

The method of removing them out of the pots with balls, is generally easily effected to most potted plants. Sometimes, in small plants, it is performed by turning the pot mouth downwards, and striking the edge

against something; the plant will come clean out, with the whole ball about all the roots entire. Or, sometimes plants that are very well rooted, and its numerous fibres surround the outsides of the ball, it will often readily quit the pot by drawing it by the stem; or at least, if raised a little from the ground, and strike the edge of the pot or tub, the ball will often come out whole and compact. But if by either of the above methods the ball will not readily quit the pot, thrust some narrow thin instrument of iron, such as a long blade of a knife, &c. down round the sides, as already hinted, the ball will then come out with much greater facility. Sometimes, however, large plants of some years standing unshifted, will by their increased roots have so wedged themselves, as to require the pot to be broken in order to preserve the ball. And sometimes large plants in heavy tubs, such as American aloes, orange and lemon-trees, require to be flung by the stems upon some temporary erection, to draw them out of the tubs with the ball entire.

Having, however, removed any plant with its ball for replanting in a larger pot, observe, preparatory to Planting it, that as sometimes the numerous fibres will have so surrounded the outsides of the ball, as to form a sort of mat all around, it is proper to trim the grossest of them off close with a knife, all round the sides and bottom; together with some of the outward old earth of the ball; then having the pots of proper sizes, larger than the former ones, and having secured the holes at bottom, and put in some fresh compost, deposit the plant with its entire ball in the pot, minding that it stands erect, and just the proper depth; and fill up the interstice all round the ball with more fresh mould, pressing it down round the sides with your hands or a stick, adding more mould gradually; and raise the whole about an inch or two over the crown of the ball, and finish with a moderate watering to settle the new earth close in every part.

But in transplanting from one pot to another with balls, is in some cases to be avoided; for example, if a plant appears diseased or in a bad state of growth, it is most probable the fault is in the root or earth; therefore, in transplantation, it is eligible to shake the whole entirely out of the earth, in order to examine its roots, and trim off all decayed and other bad parts; then, having a fresh pot, and some entire new compost, replant your tree, &c. therein, as already directed.

In potting plants from the full ground, or beds of earth, &c. if they have been previously pricked out certain distances, and have stood

stood long enough to fix their roots firmly, many sorts may also be potted with balls, particularly most of the herbaceous, fibrous-rooted kinds, and many of the shrubby tribe, by taking them up carefully with the garden-trowel, or with a spade, as may be most convenient, according to the size of the plants; and, if necessary, pare the balls round to fit the pot, planting them as above.

Potting of seedling plants, however, immediately from seed-beds, that, by their growing so close together, rarely admit of potting with balls to their roots; so that when intended to pot such, they must be drawn out of the earth with the root as entire as possible, and potted separately in small pots, shifting them occasionally into larger, as before observed.

Sometimes in Pot-Planting, we, to save room, and for other convenient occasions, plant several small plants in each pot, especially when designed as nursery-pots, to receive either small seedlings, off-sets, slips, cuttings, &c. just to strike them, and forward them a little at first, either in hot-beds, or for removing them to different situations, such as occasional shade, shelter, &c. and in which some sorts of small slips and cuttings are sometimes planted many together, in one or more wide pots, especially where large supplies of some particular sorts are required, such as myrtle cuttings and pipings of pinks, &c. planted sometimes to the amount of a hundred or two of these small sets in one capacious pot or wide store pan, so called by the myrtle gardeners about London, who raise amazing quantities annually for the markets (see POTS); however, this is not mentioned as generally necessary, only for occasional practice, where large supplies are raised on particular requests; so that observing, in the general way of planting a few or many together in pots, either small seedlings, slips, cuttings, off-sets, &c. when they are a little forwarded, or properly rooted, and shoot a little at top, they should be all potted off separate, in proper time, each in a separate pot, especially if plants of any duration; giving them small pots at first, and as they increase in size, shift them into larger pots accordingly.

When any large growing plants, such as orange and lemon-trees, or any other kinds, are become too large for pots, they should be shifted into tubs; these tubs should be made of full inch-thick staves, and adapted to the size of the respective plants; each tub well hooped with iron, and with two hooked or bow iron handles at top, by which to move them, either by hand, or, when very large tubs, to receive poles between two men for moving the

plants where occasionally wanted; having holes at the bottom of the tubs to discharge the superfluous moisture, as observed for the pots; placing some stones, &c. to prevent the holes being clogged with the earth; the method of planting and transplanting being the same as in Pot-Planting.

In the culture of all plants in pots it is proper to stir the surface of the earth now and then an inch or two deep, to prevent its binding or becoming mossy, and to promote the growth and health of the plants: likewise to such as are not shifted annually, it is also proper to add a little fresh mould in spring and autumn, previously stirring the old at top as above, and a little way round the sides; then taking out the loosened old, replace it with an equal portion of fresh compost, finishing with a moderate watering; this will prove a very beneficial dressing to the plants, and give an air of nearness, and a more lively appearance to the whole.

In all plants in pots or tubs great care is requisite in supplying them with water, which must be observed to most sorts the year round, but more particularly in summer; for the earth containing each plant being limited to the compass of a small pot or tub, it dries very fast in hot weather, so must be often moistened accordingly; which to some plants may be requisite three or four times a week in the summer season; and to some sorts in small pots every day, or even twice a day in very dry scorching weather: but as the autumn and cold season advances, give the waterings more seldom and sparingly; and in winter, plants that are exposed abroad in pots rarely require any water at all; but those in the green house or other place of shelter must be watered occasionally also during the winter; some probably once a week, or ten or twelve days, such as all the woody kinds; others but once a fortnight or month, particularly the succulent kinds; and some of the more tender very succulent sorts will require very little moisture at any time, but especially in winter; being careful, however, always to water all sorts in pots moderately in this season of the year, and, if possible, principally in temperate mild weather, and in sunny days, and give very little in frosty weather: at no time give too much to render the earth miry wet in winter, which would prove the destruction of most tender exotics; all that is necessary is to preserve the earth very moderately moist. Potted plants in hot-houses, however, will require more frequent supplies of water in winter than any other plants in pots.

To potted plants in general we must occasionally

sionally examine that the holes at bottom are sufficiently open to discharge the superfluous moisture from occasional waterings, &c. for if these are clogged up, and detain the moisture, the consequence will be bad, for it will rot the fibres, and even the main root, and soon bring on the decay of the whole plant; however, by turning up the bottom of the pot, the holes, if stopped, are easily cleared with the end of a stick or other instrument.

Other general Observations of Tree Planting in particular.

Having above given general intimation of the several different methods of performing the mechanical operation of Planting, we will next give some hints with respect to the preparation of plants previous to Planting, particularly tree Planting, which being of the greatest importance, shall first exhibit some general remarks on that head.

In the first place observe, with respect to Planting trees of all kinds, that it is of considerable importance to give them their final transplantation whilst they are young, i. e. from about two or three to six or seven years old, and in standards when of from about three or four to six, eight, or ten feet stature; especially for all kinds of fruit-trees and forest-trees for long duration; as at the above ages and statures they will establish themselves sooner and more firmly in the ground than trees of more considerable age and growth, and in the end make the most prosperous and durable trees.

Note, however, trees ten, fifteen, or twenty feet high are occasionally transplanted, especially some deciduous forest and ornamental trees in particular cases; such as in forming ornamental plantations, where persons are in haste to have any part thereof appear conspicuous as soon as possible, or to afford immediate shade or shelter, or to form blinds to any particular compartment.

But there are many sorts of trees and shrubs of eight, ten, or twelve feet stature, both deciduous and evergreens, that may be readily transplanted with tolerable success; as, if taken up with a good spread of roots, they will take root freely, and often assume a good free growth; those sizes, however, exceeding eight or ten feet, are more proper to be employed occasionally in ornamental plantations, to effect immediate show, than for any general plantations of fruit and forest-trees.

And as to trees above twelve or fifteen feet high, although they may on particular occasions in ornamental works be transplanted, by care in removing them with a good compass of roots, or sometimes with balls, as may oc-

asionally be practised to such in particular that happen to grow on grass ground; and are not to be removed to any great distance; yet the transplantation of these large trees should not be attempted for any general purpose, but only in cases where a few trees may be required to form an immediate show or prevent shade, shelter, or blind, as aforesaid, in some particular compartments, till younger trees grow up; for they rarely establish their roots like younger growth, but often assume a stunted habit, and frequently after a few years dwindle gradually off; so that when such are employed, it is proper to have some younger trees near them to be advancing as substitutes if any of the others should fail.

However, for any general plantations, either of fruit-trees, forest-trees, or ornamental trees and shrubs, let them be composed principally of young plants from about three or four, to six, eight, or ten feet height, as these sizes will be found to root more expeditiously and effectually, as well as shoot more freely at top than large transplanted trees, and sooner attain a state of perfection.

In fruit-trees, however, we may observe that common standards being generally trained with tall stems of four, five, or six feet, in which, if with heads branching out above, at these heights, and of two, three, to four or five years growth, they, in the whole, may probably be seven, eight, or ten feet high accordingly, and sometimes in those with three or four years' old heads, will have commenced bearers in a small production of their respective fruit; and, at which ages, sizes, and state of growth, are very eligible for Planting on most occasions, in gardens and orchards, especially when desirous of having trees commencing immediate bearers, as it were, probably in some, the first or second year of planting in small portions, as above intimated:—though, for a general plantation, trees with one, two, or three year-old heads are exceedingly proper.

Likewise in fruit-trees, of those trained in the dwarf order, both as dwarf standards, and for general wall trees and espaliers, almost generally with short stems and low branching heads, of one or two, to five or six years old, and of so many feet in extent of growth, are also of eligible sizes for Planting; and, in some sorts, those of two or three, to four or five years' growth have become bearers, as hinted of the common standards, and are proper to Plant where particularly required to have trees in bearing as soon as possible, especially as in the public nurseries proper trees of the above, trained in regular order

order for immediate bearers may be obtained; however, those with heads, of only one or two years' old, are also particularly eligible to plant for a general plantation, and so train them accordingly, from the beginning, under your care, for their respective different purposes, above mentioned: but wall trees are also sometimes trained with tall stems, as half or full standards, three, four, or five feet, branching out at that height, and the branches trained in the wall-tree manner, designed to cover the upper part of high walls, &c. and for which occasion they are also proper for Planting when of the abovesaid stages of growth.

But forest-trees in particular, that are intended principally for timber plantations, it is most eligible to plant them out finally when from two or three, to four, five, or ten feet high at most, that they may establish their roots firmly in their minor state, which is of considerable importance in promoting a flourishing and durable growth, so as they may sooner attain a great stature and magnitude.

In the work of Planting trees, &c. the choice of them in the nursery for furnishing the respective plantations should be particularly attended to; that, whether in your own ground, or in the public nurseries, always chuse the straightest, most vigorous, and thriving plants of the respective kinds.

Likewise in preparing for Planting, observe that in taking up the trees for that purpose out of the nursery, the greatest care is necessary in raising them with as great a spread of roots as possible; which, however, is often ill attended to, especially when large orders of plants are to be drawn in a hurry. The ground about the trees should always be opened with the spade widely round the roots, and deep enough to get to their bottom without hacking and cutting them with the spade, but so as to raise each plant with all its roots as entire as possible, for this is of much importance in the future prosperity of the trees and shrubs.

After having taken up the trees out of the nursery, &c. it is of great moment to have them replanted as soon as possible in the places allotted for them; for, although by properly covering the roots with litter, or, if sent to any considerable distance, that by tying them in bundles, and packing them up with plenty of straw about the roots, and afterwards closely matted round, they may be preserved in tolerable good condition a fortnight or longer; yet, where it is possible to plant them the same day, or in a day or two after, before the small fibres are shrunk or dried, it will be of much advantage in the first growth of the

trees; observing, however, after trees or shrubs are taken up in order for Planting, and that either the ground not being ready, or any other hindrance prevents their being planted soon after, they should as soon as possible be deposited in a trench of earth by the roots, which gardeners call *laying them by the heels*, and so take them out as they are to be planted.

Next, with respect to preparing the trees for planting, after being drawn out of the nursery.

In the first place with regard to the root;—this part must have an occasional trimming, not however to retrench or reduce any but the maimed and decayed parts; therefore previous to planting each tree, examine the root, and cut out all such parts as have been broken or damaged in taking up, and any casual decayed parts and other blemishes, being careful to leave all the sound roots every where entire; leaving also all the small fibres that are fresh and vigorous, and only trim off such as are become dry and mouldy; suffering all the main roots to remain, mostly at full length, except just to tip off their ends a little on the under side, sloping outward; and reduce any very long stragglers, and shorten long perpendicular tap-roots, more particularly of fruit-trees, to prevent their running down into a bad soil, and to promote their throwing out others horizontally into the good earth.

Some persons, however, make it a rule to retrench or thin the roots of transplanted trees very much, and shorten them also very considerably; but it will be found that trees planted with all their sound roots will be the most prosperous in growth; for the reducing the roots with too much severity, greatly weakens the tree; and, as every one must know, that all plants and trees receive invigoration, and their most essential nourishment from the roots and fibres, so that it is certainly an act of high imprudence to destroy the roots of any tree that are good and sound in every respect, and wait a considerable time for new ones, when we are actually possessed of a sufficiency that are good; it is therefore consequently the safest way to leave all the good roots, and only retrench blemished and decayed ones, as already observed.

And with regard to the preparation of the head of the trees previous to Planting, the principal care is to trim off straggling shoots and branches from the stem, leaving the head for the generality entire, only just retrenching very irregular branches, and shortening any very long stragglers; and always suffer the main or leading top shoot to remain at length, to aspire in height as fast as possible, particularly

larly forest-trees, and all others that we design shall grow to a lofty stature, for in this consists their beauty and worth.

With respect to fruit-trees, however, sometimes a more accurate regulation of the head preparatory to Planting may be requisite, more particularly dwarfs for espaliers and walls. For example, if the fruit-tree is taken from the nursery at one year old from the budding and grafting, and with its first shoot from budding and grafting entire, this first shoot must necessarily be shortened or headed down to force out lateral wood below, to furnish the bottom properly; but observing this heading down is not necessary at the time of Planting, and is most eligible to plant the tree with its said first head entire, to remain till spring, until the tree has taken fresh root and begins to shoot; for the head remaining will greatly promote the rooting: then in March or beginning of April, the tree having taken root, as you will observe by its effort for shooting at top, head it down within half a foot, or five or six eyes of the insertion of the bud or graft, and the shoot so headed will throw out, from its remaining lower eyes, several lateral branches the ensuing summer.

On the other hand, if the fruit-tree is two, three, or more years old from the budding and grafting, and the first shoots were headed down in the nursery at the proper time, and that in consequence thereof, produced several lateral shoots, to give the head its first formation; or even if the tree has stood long enough to form a good full head, it is proper in both cases to plant it with its whole head entire; only retrenching any irregular branch, or any very luxuriant shoot; or thin out the worst of such as are evidently too close or crowded, leaving however all the regular branches, suffering them to remain also at full length, except just to reduce any very long rambler consistent with the extent of the other branches.

For in new Planting trees it is very improper to retrench the branches too severely, and cut all that remains short, as is very often practised in transplantation, on a supposition to strengthen their roots, which however has often the contrary effect; for the branches and leaves imbibe the refreshing influence of the air, &c. which being conveyed to the roots, proves nutrimental, and contributes exceedingly towards vegetation, and consequently promotes the rooting afresh more expeditiously and effectually; and until this is well effected, the tree will make but little progress in its top growth.

Besides, by a severe retrenching, and a ge-

neral shortening, of fruit-trees in particular, you would thereby, in most sorts, cut off the very parts where fruit would have been soon first produced; and probably cost the tree two or three years growth to furnish new branches equal to those cut away, as well as retard its bearing in proportion. And it often happens by such a general amputation of the branches of all new planted trees at the time of Planting, they, for want of branches to collect vegetative nourishment, either make very little progress in shooting for two or three years after; or sometimes, when they do shoot, throw out a profusion of unnecessary wood from the remaining eyes or buds.

For, as we formerly observed, that although shortening the branches of fruit-trees in particular is sometimes proper in young trees of one or two years old from budding or grafting, to force out a supply of lateral wood to furnish the first regular formation of the head, more particularly dwarfs for espaliers and walls, yet if you are about to transplant the tree, and the operation of heading being necessary as above, it ought not to be done till after the tree is planted, and has begun to take root and make an effort for shooting in March or beginning of April; for when headed down at Planting, they, for want of the head, rarely either strike root or shoot at top so freely.

Therefore if young fruit-trees at Planting, whether dwarfs or standards, are furnished with five or six or more good regular principal branches, of one, two, or more years' growth, it would be a great pity to retrench any part of them, and disfigure the tree, either on the consideration of strengthening it, or to force out more branches; particularly apples, pears, plums, and cherries, which should at all times be but sparingly shortened; and since several good branches being already obtained in the proper parts to give the head its first regular form, they will in their turn readily furnish more; and if there is a vacancy in any part, it will be better to endeavour to fill it by stopping some of the young shoots produced the summer after Planting, by either pinching or pruning them in May or June the same year to three or four eyes, or cut them down to that length in winter or spring following.—Some fruit-trees, however, such as peaches, nectarines, &c. against walls, require most of their young shoots to be shortened annually.—But for more particulars of all the sorts, see their respective genera.

Standard fruit-trees, when designed they shall form spreading heads, branching out near the top of the stem regularly all around, they,

they, if grafted high in the stem, must, like the dwarfs, have also the first shoot from the budding or grafting, headed down to four or five eyes, to force out a set of lateral branches near the insertion of the bud or graft; or, if the grafting and budding was performed near the ground, and the first shoot trained to a proper height for a stem, and if required to have a spreading head, it may also be topped at the desired height, to throw out a supply of lateral branches each way, near the head of the stem, as above said; but sometimes, when the first heading, in either of the above methods, does not furnish a proper supply of branches to give the head its first proper formation, a second heading is occasionally performed the next spring, upon the shoots produced from the first.

Observing, however, that all the above works of heading standard fruit-trees, in particular, should always be performed in the nursery, a year or two, or more, previous to final transplantation into the garden or orchard, that the trees may be furnished with several regular branches to form a head, at the time of Planting; and, as before observed, it is proper to plant it with all its said head entire; except reducing such irregular growths as already mentioned, so leaving all the regular branches at their length, suffering the whole to shoot up, and branch away in their own way; and they will annually advance in length, and gradually furnish laterals to fill and spread the head proportionably.

But remarking particularly, that standard-fruit-trees, having been previously headed in the nursery a year or two or more before, and in consequence are now furnished with several regular branches of one, two, three, or more years growth, they should on no consideration be either retrenched or shortened, neither at planting nor afterwards, for the reasons before given; and also that as most fruit-trees begin to blossom and bear first towards the upper parts of the branches, more particularly apples, pears, plums, and cherries, which always produce their fruit upon short shoots called *spurs* or *fruit-buds*, that mostly rise first towards the ends of the branches; but which in this shortening would all be cut away, and retard the bearing two or three years, besides all the other disadvantages above mentioned.

But when standard fruit-trees are required to aspire more considerably in height, rather somewhat pyramidal, or conic ways, than horizontally, no heading at all need be practised, neither in the nursery, nor at the time of final planting, but the whole, quite

from the budding or grafting, suffered to remain entire, and shoot up, and branch according to nature; and they will naturally form a regular head, some sorts hemispherically, others more of the pyramidal, or conic figure.

As to forest trees, &c. their preparation, previous to Planting, after being drawn out of the nursery, is only to trim the blemished roots, as before observed, and prune off all branches from the lower part of the stem, cutting the lower ones close, the others to two, three, or four inches, particularly the deciduous kinds, leaving the head always tolerably branchy, and mostly entire; not to trim away all the branches to one leading shoot only, as is often practised, but leave a proportionable share of the upper more erect branches, to form some tolerable head, and only just retrenching the lower stragglers, very long rambling luxurians, and very irregular growths, to preserve a little regularity; being particularly careful to leave always the top or leading shoot perfectly entire, unless it is decayed, or is very crooked, bending much downwards, &c. in which cases, if any straight shoot is conveniently situated, the crooked part may be retrenched down to the straight shoot, which leave entire to run up in height, as without a leader a tree can never aspire to any considerable stature; for the leader, by its annual erect shoot, gradually increases the length of the stem, and, as it advances, sends out a supply of laterals to furnish the head, branching and spreading in proportion, according to the natural growth of the respective sorts.

But in planting tall trees, where designed to form shade, shelter, or blind, as soon as possible, very little reduction of the branches of the head may be necessary, only to reduce any very irregular growers.

However, in removing pretty large trees of any sort, with considerable heads, especially of a very spreading or crowded nature, it may be proper to reduce the whole regularly, both in some proportion to the root, and that the winds may not have too much power to incommode it after Planting; in which cases, it may be necessary, as just above observed, to retrench, or reduce some of the most extensive lower branches, thin out some where much crowded, and reduce others down to some convenient lateral branch they may support, so as each reduced branch may, notwithstanding its reduction, terminate in a leader, having its top entire, not to exhibit naked ends of branches, standing up like stumps. Caring, however, in such large trees, that the above reduction should be so

judicious, as the remaining branches may still exhibit a moderately full, and somewhat regular head.

With respect to the preparation for planting of all the shrub kind, only just trim straggling under branches and shoots from the lower part of the stem, retrench luxuriant of the heads that seem to shoot away very irregularly and vigorously, at the expense of the neighbouring branches, and reduce long rambles, &c. just to preserve a little regularity.

All new planted tall trees should generally be staked as soon as planted, in order to support them steady every where, till well rooted, and have somewhat established their roots, that tempestuous winds may not overset, or otherwise incommode them; particularly all trees of six, eight, or ten feet high, and upwards; one tall stout stake to each tree, or more, if the trees are of large size, sharpening the lower ends, and drive them firmly into the ground near the stem; or, if larger trees, place it slant-ways, at a little distance, so as its top reach the upper part of the stem, on the opposite side to that most exposed to the winds, in which it will have the greatest effect; but large trees, with full heads, should generally have very tall strong stakes, three to each tree, placed triangular ways, also in an oblique or slanting direction. Having, however, fixed the stakes in either of the methods, as the trees shall require, then directly proceed to bind the stem of the trees firmly to the stakes, previously wrapping some soft substance, such as hay-bands, &c. round the stem, at the part where it is to be fastened to the stakes, in order to save the bark from being rubbed off against the stakes, by the motion of the winds; which is more particularly necessary to tall plants that are much exposed: so having some strong bandages, such as rope-yarn, or the like, or for smaller plants some tough osier or other withy kind, then bringing the stem and stakes close, so as to preserve still the erect position of the plant, bind them firmly together, by drawing the bandage round the stakes, and about the stem, over the hay wrapping, if any, and fasten it so securely, as to admit of no motion between the stake and stem of the tree.

But large trees, of some considerable stature, with full heads, are often supported also with ropes suspended from the top of the stem, three different ways, straining them tight, and the end of each rope staked securely down to the ground; so that, whatsoever way the wind blows, the ropes will stay the tree still in its upright position.

Such new planted trees as are exposed to cattle, should each be well fortified all round the stem with thorn bushes.

The general Planting season, for all sorts of trees, is autumn and spring, i. e. the autumnal Planting being from the beginning of the decay of the leaf, in October, until December; though ever-greens may be begun to be transplanted towards the middle or latter end of September, and continued till December aforesaid. And for the spring Planting, February and March is the principal time, but may be continued occasionally until April; and several sorts of tender young ever-greens succeed best when planted the beginning of that month.

However, to those persons that have much Planting or other business in hand, I would observe, that Planting need not be confined particularly to autumn and spring; for all hardy kinds, both fruit-trees, forest-trees, shrubs, &c. may be planted occasionally, almost any time, in open weather, from October till March, especially in all moderately dry soils, with good success.

Planting, however, forward in autumn, is of some advantage, as the trees will have time to root more firmly, ready for the ensuing spring shoot, as well as be able to stand the drought of spring and summer somewhat better than those planted later.

But in very humid soils, where water is apt to follow the spade in winter, it is eligible always to plant forward in autumn, or not till spring; but rather principally the last mentioned season, toward the latter end of February, or in March.

Farther Observations, particularly in Planting herbaceous Plants.

In preparing to plant herbaceous fibrous-rooted plants, our first principal care is to remove them with good roots: young seedlings, &c. especially require particular care in drawing them with proper roots. When they are to be taken all clean up, they may be readily loosened and raised out of the earth with some instrument, with all their fibres entire; but when they are only to be thinned, they do not admit of this, because it would disturb the remaining plants, so must be drawn out by hand carefully, with as much root as possible.

Many sorts of fibrous-rooted plants, however, being so hardy, and apt to grow, that if taken up almost any how, with a little root, they will often strike: it is nevertheless advisable to use care in drawing all sorts for Planting, with tolerable roots, as they will in proportion make more progress in their future growth. And as to any trimming preparatory

paratory to Planting, very little is wanted, only in some sorts, just shortening very long naked spindly roots, and trimming any straggling fibres; though in numbers of plants of this tribe hardly any trimming at all is required, neither in root nor top; all of which however, you will be able to regulate according to observation, agreeable to the hints here exhibited, and in the culture of the respective articles.

The most commodious and expeditious mode of Planting herbaceous seedlings, slips, off-sets, cuttings, &c. is by dibble, as already observed in *Planting by Dibble*; and for such as have been previously pricked out in nursery-rows, many sorts may be drawn with little balls, when required, and holed-in with a trowel, especially numbers of the choicest flowery tribe; but almost all sorts of pricked-out herbaceous fibrous-rooted plants may either be drawn with full roots, and planted by dibble, or with balls of earth, and holed in by trowel, as shall seem most convenient according to the nature of the plants.

Many sorts of fibrous-rooted plants may be planted out at once, where they are finally to remain, particularly all long spindly-rooted kinds; likewise numerous others of the more fibry-rooted sorts may also be planted out finally from the seed-bed, provided the ground is ready for their reception: yet I would observe, when the ground is not ready to receive them for some considerable time, it will be eligible to thin out a quantity from the seed-bed, and prick them in nursery rows five or six inches asunder, to remain a month or six weeks, or some two or three months, or longer, till the ground is ready for their reception, whereby they will acquire good roots, and a robust firm growth, in order for final transplantation, in autumn or spring: whereas when they all remain long in the seed-bed, they, by standing so close, draw each other up very slender and weak, and never make near so good plants as those previously thinned and pricked out at small distances; which, after growing a month or two in nursery rows, will all readily rise with full roots for final Planting, and many sorts also with good balls of earth where necessary, which may be more particularly requisite to some of the choice, flowery tribe.

The season for Planting most herbaceous fibrous-rooted plants is any time in spring and autumn, also occasionally in summer, especially in pricking out young seedlings, both annuals and perennials, of the spring sowing, and in slips and cuttings of older perennial plants; and likewise, on particular occasions,

large plants of advanced growth might be transplanted in that season, according as they may be required for different purposes, as is always hinted in the culture of the various sorts; and many hardy kinds even in winter, in mild open weather, when occasionally wanted; for most of this tribe of plants readily and expeditiously take fresh-root at almost any season, in mild weather; choosing generally moist weather in spring and summer, but especially from April until September; and chiefly dry weather for winter Planting: observing likewise in the spring and summer Planting, it is proper always to give a moderate watering as soon as planted, but especially in summer, unless it should happen to rain hard enough to descend to the roots; otherwise a little water to settle the earth close to the roots is of very essential service.

As to planting herbaceous bulbous-rooted plants, such as hyacinths, narcissus, tulips, and all others of the bulbous tribe, they ought not generally to be removed but only in summer, when their stalks, leaves, and fibres of the bulbs decay; for these parts of bulbous plants always decay annually in summer, soon after they have flowered and ripened seeds; but the bulbs themselves are perpetuated; so that the above period is the most proper time to plant out seedlings and off-sets of these sorts previously into nursery beds for two or three years or more, to acquire a proper age and size for flowering, then transplanted finally: it is also the most proper period for transplanting full-grown bulbs, either from one place to another directly, or to take them up to keep for autumn and spring Planting.

For it should be observed of those bulbous kinds, that if removed for Planting out of the proper seasons as above, either before they flower, in spring or summer, &c. or after the flowering is past, in autumn or winter, if they have remained long enough to have struck fresh fibres into the ground, it would either greatly retard, or in several sorts entirely prevent their flowering the ensuing season; or others would not flower in tolerable perfection, so that where any, on particular occurrences are removed for Planting unseasonably, as above, they should be replanted again directly, or as soon as possible, for at this period of removal, if retained long out of the ground, they would shrink and diminish in size considerably.

All bulbous-rooted plants taken up at the above time of the decay of the stalks, leaves, and fibres, may either be planted again directly, or in most sorts, kept till September, October, or November, and then planted; which

which for the choicest kinds is the most eligible practice, as observed in their culture: and in order to have a late bloom a few may also be retained out of ground till spring, about January or February; but plant the principal always in autumn, about October and November.

Bulbous roots are planted two or three different ways, as by dibble, by drilling-in, and by hedding-in. See each of these methods as exhibited separately under this article, PLANTING. See also BULBUS.

Choose always dry weather for Planting most kinds of bulbs, especially all the choice kinds.

PLASHING HEDGES, the work of laying down the stems and branches of old run up open hedges horizontally, to close and thicken them below, &c.

This work, though rather more generally applicable in agriculture business than in gardening, is also sometimes necessary to be done in gardens, having outward hedge-fences that have been permitted to run up in rude growth, naked and open below; and which is reformed and reduced to order, by a proper trimming thinning, cutting and laying down the general stems and branches slantingly along according to the range of the hedge, between others left upright; assisting in this with the hedge-bill in occasionally cutting or gashing the larger stubborn growths, towards the lower parts on the upper side, by an oblique stroke of the bill, cutting them slantingly, less or more, according as it may seem necessary, in order to render them pliable or yielding to Plash, or lay down horizontally longways between others of the strongest stems left in upright growth in the order of stakes; and at the same time Plashing in all the smaller lateral branches; and thus proceeding in a regular manner, it closes all lower vacancies, and thickens the whole regularly from bottom to the top, in its proper moderate height of three or four feet, or a little more or less, according to the growth of the hedge in its disorderly state; which if run up tall, and naked below, is reduced lower accordingly in the Plashing in the above proportion; and hereby the whole, if the Plashing is properly executed, will form a close impenetrable hedge.

In performing this work, some of the main upright stems of the hedge are left in erect growth at small distances, as the Plasher proceeds in the business, as growing stakes, between which to plash, and lay the others and the general branches horizontally as before suggested, assisted occasionally by other stakes driven down in the hedge-row as required.

This work is performed occasionally to any sorts of common deciduous hedges: as white-thorn, black-thorn, elm, beech, &c. and the proper season is any time from the fall of the leaf in autumn till March or April, at farthest.

When proceeding in this business, it is often necessary, in very disorderly rough hedges, previously to trim or lop off much of the outward and over-growing rude branches, and large naked wood, and evidently superabundant growths, below and above; and as the Plasher goes on, fixing on some of the strongest upright hedge-stems to leave at moderate distances, for growing stakes as aforesaid, cut down to the proper height, proceeding at the same time in the plashing or laying the most branchy wood, and with the hedge-bill, cutting or gashing occasionally such of the larger stems and branches that are not otherwise pliant enough to admit of Plashing eligibly; bringing the whole down in a regular gradation one after the other, Plash or lay them properly along somewhat horizontally between the uprights, some nearly close down, or with the brushy parts more or less towards the ground to close the lower vacancies and fill the bottom properly, others over these; all arranged longways conformable to the range of the hedge, lopping off any very disorderly, or over abundant and impliable parts, either laterally or terminally; so continue the Plashing one over the other in the same regular order between the standing uprights, to the intended height, as the hedge admits, driving down other stakes occasionally in places where required; more effectually to fix the plashed stems and branches; and thus proceeding with some degree of regularity, the whole is formed equally close and full from the bottom upwards, three, four, or five feet high, as the nature of the hedge allows, or as may be thought necessary, whereby to have the whole the most effectually fencible.

Then the work is generally finished by trimming all irregularities at sides and top, with the proper hedge-bill, striking off all the too projecting and straggling parts below and above, both to give the hedge a close regular appearance, and that it may shoot more effectually in a close thickening growth.

PLATANUS, Plane Tree.

This genus consists of lofty deciduous trees, of high repute for their singularly beautiful growth and luxuriant foliage; being delightful trees for all ornamental plantations, and for affording shade; also as forest or timber-trees, they growing remarkably straight to a considerable height and magnitude; adorned with very large simple, palmated and lobated leaves,

leaves, from six to twelve or fourteen inches broad, but very small monœcious flowers, collected into close globular heads, succeeded by numerous seeds, digested into large round rough balls.

Class and Order, *Monœcia Polyandria*.

Characters.] CALYX, male and female, very small flowers apart on the same plant, the male florets digested into globular katkins, having very small cups; and females collected into a large roundish ball, having very small scaly calyxes. COROLLA in the males is scarcely discernible, and in the females each floret having many small concave petals. STAMINA, numerous, small, oblong, coloured filaments, having four-cornered antheræ. PISTILLUM, several subulated *germina*, having subulated styles, and recurved stigmas. PERICARPIUM, none; numerous roundish seeds, surrounded with down, and collected into round hard balls.

There are only two real species, which, however, comprise some varieties, all of which are deciduous, and of hardy growth.

The species are,

1. *PLATANUS orientalis*.

Eastern Asiatic Plane-Tree.] Rises with a very straight, smooth, branching stem, to a great height; palmated leaves, six or eight inches long, and as much broad, divided into five large segments, having the side ones cut into two smaller, green above, and pale underneath; and long pendulous pedunculi, each sustaining several round heads of close-sitting, very small flowers; succeeded by numerous downy seeds, collected into round, rough, hard balls.

It is a native of Asia, and many parts of the East, and grows in great plenty in the Levant.

Varieties of this are,

Spanish, or middle Plane Tree.—Having remarkably large leaves divided into three or five narrower segments or lobes.

Maple-leaved Plane Tree.—Having smaller leaves, somewhat lobated into five segments, resembling the greater-maple leaf.

2. *PLATANUS occidentalis*.

Western American Plane Tree.] Rises with a straight smooth stem, to a great height, branching widely around; lobated leaves, seven or eight inches long, and from nine or ten, to twelve or fourteen broad, divided into three large lobes; and very small flowers, collected into round heads, succeeded by round, rough, balls of seed. It is a native of Virginia, and other parts of North America, where it attains an enormous size, and is remarkable for having its stem all of an equal girth for a

considerable length; and we have an account of some trees being eight or nine yards in circumference, and when felled, afforded twenty loads of wood.

All these elegant trees are of hardy temperature; so as to prosper here in any common soil, and exposure in our open plantations, &c. and are some of the most desirable trees of the deciduous tribe; were in singular esteem among the ancients of the East for their extraordinary beauty and delightful shade they afforded by their noble foliage.

The leaves commonly expand in May, and fall off early in autumn; and the flowers appear in spring, a little before the leaves, being succeeded by seeds, which, in fine seasons, frequently ripen here in September, produced in round, rough, hard balls, suspended on long pendulous peduncles effecting a curious singularity.

As to the uses of these fine trees in gardening, they have singular merit for all ornamental plantations; their straight growth, regular branching heads, and lofty stature they attain, together with the extraordinary breadth of their luxuriant leaves, render them extremely desirable furniture to adorn avenues, lawns, parks, and woods; some disposed in ranges; some as single standards; others in clumps; some in groves, &c. and are most excellent for shade; for it is observable, that no tree is better calculated to defend us from the heat of the sun in summer, by its noble spreading foliage, and to admit the sun's rays more freely in winter, on account of the distance of its branches, which, in most different sorts of trees, is always in proportion to the size of the leaves.

They may also be employed in the collection of forest-trees, in woods, to grow up to timber, in which they will also prove advantageous in time.

In short, these noble trees claim the esteem of every one concerned in plantations of every kind; but more particularly in extensive works, where they may be so variously disposed, as to have a charming effect.

Their Propagation.

The propagation of these trees, is by seed, layers, and cuttings.

By Seed.—The seeds frequently ripen in these parts, and are also procured from other countries, and may be obtained of the nurserymen, or seedmen; observing, the best season for sowing them is autumn, if they can be then possibly procured, otherwise in the spring;—choosing a somewhat lightish, mellow soil; and having dug the ground, and raked it

it fine, form it into four feet wide beds, and either scatter the seeds evenly on the surface, and rake them in, or, previously with the back of a rake, turn the earth off the surface near half an inch deep into the alleys; then sow the seed, and directly, with the rake turned the proper way, draw the earth evenly over the seeds, and trim the surface smooth; many of the plants will rise in spring, and probably not generally till the spring following. When they are one or two years old, plant them out in nursery rows, two feet asunder, and about half that distance in the lines; here to remain till of a proper size for final transplantation.

By Layers.—This method of propagation is very commonly practised in the nurseries, in default of seed, and by which they most readily grow; for which purpose, some stout plants for stools must be planted, which in a year after must be headed down near the bottom, that they may throw out many shoots near the ground, convenient for laying; which, in the autumn after they are produced, lay by slit-laying; and by autumn after, they will be well rooted, and form plants two or three feet high, so may be separated, and planted in nursery rows, like the seedlings.

By Cuttings.—All the sorts will take tolerably by cutting off the strong young shoots; but the *Platanus occidentalis* more freely than the Oriental kind. Autumn, as soon as the leaf falls, is a proper season, or occasionally in the Spring; choosing strong young shoots, and plant them in a moist soil; many of them will grow, and make tolerable plants by next autumn.

It should be remarked, that in order to continue the distinction of the varieties more effectually, they should be propagated either by layers or cuttings: for when raised from seed, those of the respective species generally vary.

PLEASURE-GARDEN, or Pleasure-ground.

The district commonly called the Pleasure-ground, may be said to comprehend all ornamental compartments, or divisions of ground and plantation, surrounding a noble site, consisting of lawns, plantations of trees and shrubs, flower compartments, walks, pieces of water, &c. whether situated wholly within the space generally considered as the Pleasure-garden, or extended over ha-ha's, or by other communications, to the adjacent fields, parks, paddocks, or other out-grounds.

In designs for a Pleasure-ground, according to modern improvements, consulting rural

disposition, in imitation of nature, all too formal works being almost abolished, such as long straight walks, regular intersections, square grass plots, corresponding parterres, quadrangular and angular spaces, inclosed with high clipped hedges, &c. and other uniformities, as in ancient designs; and instead of which, consists now of rural open spaces of grass ground, of varied forms and dimensions, and winding walks, all bounded with plantations of trees, shrubs, and flowers, in various clumps, and other compartments, exhibited in a variety of imitative rural forms, in curves, projections, openings, and closings, in imitation of a natural assemblage; not forming inclosures of hedges, &c. but having all the various plantations open to the walks and lawns; for example: a spacious open lawn, of grass ground, being generally first presented immediately on the front of the mansion, or main habitation, sometimes widely extended in open space on both sides to admit of greater prospect, &c. and sometimes more contracted, towards the habitation widening gradually outward, and have each side embellished with plantations of shrubbery, groves, thickets, &c. in clumps and other compartments, in sweeps, curves, and projections, towards the lawn, &c. with breaks or opens of grass spaces at intervals, between the plantation; together with serpentine gravel-walks, winding under the shade of the trees; extended plantations, being also carried round next the outer boundary of the ground, in various openings and closings, having gravel-walks winding through them, for shady and private walking; and in the interior divisions of the ground is exhibited serpentine winding walks, and elegant grass opens, arranging various ways, all bordered with shrubberies, and other tree and shrub plantations, flower compartments, &c. disposed in a variety of different rural forms and dimensions, in easy bendings, concaves, projections, and straight ranges, occasionally; with intervening breaks or opens of grass ground, arranging between the compartments of plantations, &c. both to promote rural diversity, and for communication and prospect to the different divisions; all the plantations being so variously arranged, as gradually to discover new scenes, each furnishing fresh variety, both in the form of the design in different parts, as well as in the disposition of the various trees, shrubs, and flowers, and other ornaments and diversities.

So that in designs for a Pleasure-ground, according to modern gardening, a tract of ground of any considerable extent may have the

the prospect varied and diversified exceedingly, in a beautiful representation of art and nature, as that in passing from one compartment to another, still new varieties present themselves in the most agreeable manner; and even if the figure of the ground is irregular, and its surface has many inequalities, in risings and fallings, and other irregularities, the whole may be improved without any great trouble of squaring and levelling, for by humouring the natural form, may cause even the very irregularities to conceal their natural deformities, and carry along with them an air of diversity and novelty.

In these rural works, however, we should not abolish entirely all appearance of art and uniformity; for these, when properly applied, gives an additional beauty and peculiar grace to all our natural productions, and sets nature in the fairest and most advantageous light.

But some of our modern Pleasure-gardens, in which rural design is copied to an extreme, are often very barren of variety and entertainment, as they frequently consist only of an extensive grass lawn, like a great field, having a running plantation of trees and shrubs all round, just broad enough to admit of a gravel walk, winding through it in the serpentine way, in many short twists and turns, and bordering at every turn alternately upon the outward fence and the lawn; which are continually obtruded upon the sight, exhibiting the same prospect over and over, without the least variation, so as that after having traversed the walks all round this sort of Pleasure-garden, we find no more variety or entertainment than at our first entrance, the whole having presented itself at once at the first view; and we might often see as good a garden, sometimes in a common field, that is bordered with any kind of plantation.

Therefore, in laying out a Pleasure-garden, the designer ought to take particular care that the whole extent of his garden be not taken in at one view; only exhibiting at first a large open lawn, or other spacious open compartment, or grand walk, &c. terminated on each side with plantations of curious trees, shrubs, and flowers, in compartments, exhibiting only some opens at intervals; and behind these have compartments of the like plantations, with grass opens, gravel walks, water, and other ornaments; so that a spectator will be agreeably surprised to find what terminated his prospect was an introduction to new beauties and variety.

But it is impossible to exhibit any regular directions for planning a Pleasure-garden,

agreeable to the prevailing modern designs, being generally in some fancied natural imitation as aforesaid; as the plan may be varied exceedingly, according to the natural figure, position, and situation of the ground and taste of the designer, so we can only give some general hints.

General Sketch of the Design.

In this we can only give the following general sketch, which may be varied according to the situation and extent of the ground.

With respect to the situation; this must consequently be immediately contiguous to the main house, whether high or low situated; remarking, however, that a somewhat elevated situation, or the side or summit of some very moderate rising ground, is always the most eligible on which to erect the chief habitation, arranging the Pleasure-garden accordingly; such an exposure being the most desirable, both for the beauty of the prospect, and healthfulness of the air; a low level situation, neither affording due prospect of the garden, nor adjacent country, besides being liable to unwholesome dampness, and sometimes inundation in winter: there are, however, many level situations, forming plains or flats, that possess great advantages both of soil and prospect, and the beauties of water, without too copious moisture; there are also sometimes large tracts of ground, consisting both of low and high situations, as level plains, hollows, eminences, and declivities, and other inequalities, which may be so improved, as to make a most desirable spot for a Pleasure-garden, as the scene may be varied in the most beautiful manner imaginable. However, the choice of situation and scope of ground is not always attainable, so every one will regulate his plan in the most commodious manner possible, agreeable to the above hints.

The extent of a Pleasure-Ground may be various, according to that of the estate or premises, and of the quality and fortune, &c. of the owner; so may be from even a quarter or half an acre, to thirty or forty or more.

The ground should previously be fenced, which may be occasionally a wall, paling, or hedge, or some of each sort, as may be convenient, and in some parts a fosse or ha-ha, where necessary to extend the prospect, either at the termination of a lawn, walk, or avenue; observing, the close fences should generally be concealed within side, particularly the wall and paling fences, by a range of close plantation, unless where the wall may be wanted for the culture of wall-fruit. But sometimes, when a Pleasure-ground

ground adjoins to a fine park, paddock, or any agreeable prospect, the boundary fence on that side is often either a low hedge, or a ha-ha; but many prefer the latter, especially at the termination of any spacious open, both to extend the prospect more effectually, and give the garden an air of greater extent than it really has, at a distance, the ha-ha being sunk, nothing like a fence appears, so that the adjacent park, fields, &c. appear to be connected with the garden. See WALLS, HEDGES, FOSSE, &c.

But with respect to the arrangement of the several divisions, the following general sketches are on a supposition of a considerable tract of ground; and if the plat of ground is small, a greater simplicity of design must be observed in proportion.

First, a noble open lawn of grass ground is extended on one of the principal fronts of the mansion or main house, directed either towards the open fields, park, or adjacent country, or towards the garden, if the situation requires it; or may be extended a little more or less each way, according as the situation and extent of ground may admit, or require; but, if possible, always considerably the most extensive on the principal front; and should be considerably wider than the house, if possible, and twice as long as broad at least; or if the scope of ground admits it, may even be extended in length, as far as the extreme boundary of the garden; or carried over ha-ha's, to the adjacent park or pasture-grounds, &c. widening gradually in some varied order, from the house outward; having each side bounded by various plantations of trees, shrubs, and flowers; in groves, clumps, thickets, and other compartments, exhibited in a variety of rural forms, and dimensions, in moderate concave and convex curves, and projections, to break all appearance of too stiff uniformity; introducing also, between the plantations at intervals, breaks, or opens, of grass-ground, communicating with the lawn and internal divisions, in some places widely spread, in others more contracted; leaving also tracts for serpentine gravel-walks, some winding under the shade of the plantations, so conducted as to command views of the lawn, and the interior divisions occasionally; observing, the homeward part of the plantation should be inclined a little toward each wing of the house, that company may sooner arrive in the walks of the shrubbery, wilderness, and groves, under the shade and shelter of the trees; but the outward extension on each boundary should widen gradually towards the extreme termination, to give an air of grandeur, and

admit of a full prospect from and to the mansion. Each boundary being planted with a choice variety of ornamental trees and shrubs, deciduous, and ever-greens, arranged principally in separate clumps, and other compartments, alternately, some consisting wholly of lofty trees, arranged sometimes in regular groves, and some in groups or clumps, variously; other compartments being entirely of the shrub kind; and others consisting of trees, shrubs, and herbaceous perennials together: in all of which, arranging the taller growth backward, and the lower forward, according to their gradation of height; embellishing the fronts with the more curious low-flowering shrubs and ever-greens, interspersed with various herbaceous flowering perennials, all open to the lawn and walks; and the termination of the lawn at the farthest extremity, if extended considerably outward to some agreeable prospect, is generally continued open the whole width, by sinking a ha-ha at the limits of the garden, to unite the view with the adjacent pastures, plantations, and the open country, as well as admit of a grand view to and from the mansion. See LAWN.

But sometimes the termination of the lawn, in default of prospect beyond the limits of the garden, or that it is necessary to conceal the garden from the view of persons without, is by a plantation of stately trees, in gradual concave, and convex sweeps. Or small lawns that extend immediately towards the garden, may be terminated by elegant shrubbery clumps, continued to the interior division. However, for considerable lawns, extended outward to the utmost verge of the garden, that admit of any tolerable prospect of the adjacent fields, &c. a fosse or ha-ha termination, is, in some situations, the most eligible, in order to continue the prospect. See FOSSE and LAWN.

From the boundary plantation of the lawn, is continued the internal works, in a great variety of rural divisions, in spacious walks and open spaces of grass, bounded by shrubbery clumps, wilderness plantations, groves, thickets, &c. all in varied, elegant compartments, as before mentioned, to exhibit a grand rural imitation, diversified in a variety of forms.

In the general arrangement, the great art is to vary the prospect of the different divisions, so as they may variously present an air of novelty, and source of convenience and entertainment.

Around towards the outer boundary fence, is generally arranged a plantation of trees and shrubs, in varied, easy, concave sweeps, and

and projections next the garden, or lawn, &c. and broad enough to admit of a serpentine gravel-walk, winding through the whole extent, under cover of the trees and shrubs, for private and shady walking: varying the plantation in different degrees of thicket and openings occasionally, with here and there breaks and openings, for prospect from the walks to the different parts of the garden and open country; and with opening or concave grass spaces, bordering the walk at intervals for diversity, and as places for seats, &c. under shade of the plantation.

In the more interior parts are exhibited magnificent walks, avenues, and grass openings, some nearly straight, others more or less winding, arranging in different directions; and having each side embellished with plantations, in shrubby clumps, groves of trees, wilderness plantations, thickets, and flower compartments, distributed in various arrangements and distances, admitting intervals of grass ground surrounding and communicating with the various plantation divisions, in some places of considerable extent, in others more or less contracted, according to the distance and arrangement of the several clumps and other compartments of plantation, which should be exhibited in a variety of windings, openings, and closings, from one degree of light and shade to another; introducing also grand openings, at intervals, between the principal districts of plantation, for views or prospect, &c. and from the main walks and openings, have other smaller walks branching off at due distances, in a winding direction, to places of shade and retirement, amidst the plantation, and for communication from one division to another; exhibiting also opens of different figures and dimensions, surrounded by clumps of trees and shrubs, serving some for recesses, and places of shade, aforesaid, others for garden edifices, as temples, grottoes, rural seats, statues, &c. and sometimes for pieces of water; and if water from some upper spring or head, can be led in a winding course, through the lower parts, in gentle meanders, it will have a charming effect; other internal divisions appear with an air of grandeur and magnificence, by exhibiting a spacious opening of grass ground, bounded by the noblest trees and shrubs, in various elegant clumps, groves, groups, and straight ranges; and the opening terminated by some fine open prospect, noble piece of water, or ornamental building; and with gravel-walks, extending through the boundary plantations. Another part shall appear more gay and sprightly, displaying an elegant flower-ground, designed somewhat in the parterre

way, in various beds, borders, and other compartments, furnished with the most curious flowers; and the boundary decorated with an arrangement of various clumps, of the most beautiful flowering shrubs, and lively ever-greens, each clump also bordered with a variety of the herbaceous flowery tribe.

Another division sometimes presents a wilderness in irregular partitions of plantation, having intervening spaces of grass ground and gravel walks, extending in various directions, some by winding mazes or labyrinths, into openings formed in different parts amidst the plantation, and to a grand one in the centre; the boundary plantations of this division being generally in close assemblage, with tracts of serpentine walks between; some leading in private meanders towards the interior parts, or breaking out sometimes into other walks that are open and spacious, both of grass and gravel occasionally, conducted also in serpentine turns, to cause the greater variety, having each side bordered with plantations of trees and shrubs, the tallest behind, the lower growth in front; and from these grand walks, others more narrow and close, branch off at intervals, in various windings, in some places being closely bordered with tall trees, to effect a gloominess and perfect shade; the different walks leading now and then into circular openings of grass in different parts, each being surrounded with plantations as aforesaid; making also the principal walks terminate in a grand opening in the centre of the wilderness, in which may be some ornamental edifice, or fine piece of water, &c. furnishing all the plantation compartments, with a good variety of trees and shrubs; the deciduous and ever-green kinds principally in separate clumps, or quarters, interspersed with various wood flowers promiscuously, placing the more curious kinds of shrubs and flowers towards the fronts next the walks and openings, conspicuous to view. See WILDERNESS.

Straight ranges of the most stately trees are sometimes arranged on grass ground in different parts, in contrast with irregular plantations; and produce a most agreeable effect, which though prohibited in many modern designs, always exhibit an air of grandeur; being arranged sometimes in single rows, others double, or two ranges at certain distances, forming a grand walk or avenue; in other parts, several ranges together in the manner of groves: all of which being arranged on grass ground occasionally in different situations, will have a grand ornamental appearance. See AVENUE and GROVES.

Sometimes an outward division discovers a

close plantation of trees, like a thicket of woodland, arranged in irregular assemblage, mostly close and gloomy, resembling the internal arrangement of a wood; sometimes exhibiting sudden transitions of light and shade, by openings and closings, having serpentine walks winding through every part, and sometimes leading to openings in the midst of the plantation. Others breaking out suddenly from the thicket into open prospects of the other divisions; having all the walks bordered with flowering shrubs, hardy climbers, and various wood flowers that prosper under shade, and many common hardy shrubs, and herbaceous plants scattered promiscuously among the trees, to form more or less thicket, and cause diversity in the manner of a natural wood.

In other parts are sometimes discovered eminences, or rising grounds, as an high terrace, mount, steep declivity, or other elevated situation, having the sides covered with grass and compartments of plantation; and walks leading under the shade of trees by easy ascents, to the top, where is presented an extensive prospect of the adjacent fields, cottages, hamlets, and country around, as well as afford a fresh and cooling air in summer.

Regular compartments and figures, in various forms, are also sometimes introduced in some extensive grounds, for variety, in contrast with the irregular works, and still to preserve some appearance of the remains of ancient gardening; such as straight walks, verged with borders of flowers, &c. regular parterres, in flower borders; square spaces, circles, and octagons, &c. inclosed with low clipped hedges; hedge-work, formed into various devices; detached ever-greens, formed into pyramids and other regular figures; regular grass slopes, formed on the side of some declivity or rising ground: elevated terraces; bosquets of trees, surrounded with low ever-green hedges; straight avenues of trees in ranges, &c. a little of each being judiciously disposed in different situations, may prove an agreeable variety, by diversifying the scene, in contrast with the rural works aforesaid.

Sometimes a bleak declivity, or some rough hollow ground or vale, is made to exhibit a wild or uncultivated scene, by arranging some scattered clumps of trees in the most irregular assemblage; the intervals or spaces between being rough grass ground, and here and there tufts of shrubby bushes, with sometimes a gentle rill of water, winding along the bottom of the declivity, or twisting its course through the vale.

Towards the lower parts of the garden, pieces of water are always exhibited where

possible, in the most conspicuous points of view contiguous to the termination of the main lawn, or other spacious open, representing sometimes a basin, lake, &c. and sometimes a natural river, winding its course through different divisions, and its termination concealed by a curious turn, making it appear to lose itself in the adjacent plantations.

With respect to the walks, these may be both of gravel, sand, and grass, but principally gravel for common walking; and grass for occasional walking in the heat of summer, which in dry hot weather may be more agreeable than the hard gravel-walks: therefore some of each sort is proper both for convenience and variety.

Gravel-walks, however, should lead all round the garden and into the principal internal divisions, so as to have dry and firm walking at all times of the year; when the grass is too damp, as in winter and all wet weather.

These gravel-walks should be of proportional width, in different parts, according to the extent of the garden.

As to the distribution of gravel walks:—first a magnificent one, from fifteen to twenty or thirty feet wide, should range immediately close and parallel with the front of the house, and be conducted directly across the lawn into the nearest side shrubbery and general plantation; where each side being verged with spaces of grass ground, and shrubbery clumps, &c. from this main gravel-walk, other smaller ones, from five to ten or twelve feet wide, should branch off at proper intervals, directed in the serpentine way; some leading through the outer boundary plantation, as already hinted; others into the central divisions; and others carried along the front of the boundary plantation of the main lawn; all of which walks being conducted through and between the different principal plantation, is highly requisite, both for the convenience of shade, and retirement occasionally, as well as to enjoy the variety of the different sorts of trees, shrubs, and flowers, variously presenting themselves at different turnings: for the walks having various sweeps, and windings, discovering only a moderate length at once, every turning produces new varieties; and should likewise be so contrived, as at proper intervals to discover openings for prospect into different principal divisions of the garden; having in some places the plantation of trees, shrubs, and flowers, bordering close upon the walks; in other parts, have on one side of the walks considerable grass spaces, running into

into the adjacent plantation, in one or more concave curves, to form the greater diversity.

And in some places the windings of the walks should be gradual and moderate; in others exhibit sudden turns, and grand sweeps, each turning exhibiting sometimes a magnificent projection in the plantation, others some spacious opening, bordered with curious plants; other parts a close thicket, which sometimes may seem to terminate the walk, when by a sudden turn it breaks out all at once into some grand open division, spacious open walk, an avenue, or elegant piece of water, open grove, &c. And in other parts, a walk sometimes suddenly divides into two or three divisions, leading different ways, in gradual sweeps, each separation being formed by a projecting clump of shrubbery work, or group of trees, &c. and each division of the walk is conducted by varied serpentine turns, as soon to be concealed from the other, by the intervening plantation compartments.

Sometimes, similar to the ancient designs, a spacious gravel walk is extended in a perpendicular line, immediately from the front of the habitation, dividing the lawn, or extended on both boundaries, and in other situations; and with a wide border on each side, either straight, or sometimes a little serpentine, and planted with the most curious low flowering shrubs, ever-greens, and herbaceous flowering plants.

All these gravel-walks should be laid with the best gravel, six or eight inches deep at least; but if more the better. See GRAVEL and GRAVEL-WALKS.

Grass-walks may be considered as all the open grass spaces, whether formed in the manner of walks, or as breaks or divisions between the various plantations, all of which serving both for communication to different parts, and to render the ground more rurally ornamental, and for occasional walking in dry weather in summer; but some tracts of considerable width and length, formed into grass-walks, leading to different divisions, having each side bounded with clumps of trees, shrubs, and flowers, gives an air of grandeur to the garden, allotting smaller breaks, or opens of grass, branching off between the plantation compartments, as formerly mentioned.

The grass ground of this garden may be formed, either by sowing grass seed, or by laying it with turf, cut from some common or downs; but in very extensive works turfing the whole would be a great expense; therefore seed is the most eligible for the principal spaces in very large gardens. For the

method, however of forming grass-ground, both by seed and turfing, and for keeping the grass in order, see GRASS.

Water being so ornamental in all garden designs, no pains should be spared to introduce it where possible; but where it admits of a constant running stream, from some adjacent upper spring, its beauties may be rendered admirably fine, as it may be conducted in meanders through the garden, so as to effect a beautiful assemblage of verdure and water together; and if it should be continued to any considerable length, one or more ornamental Chinese bridges may be carried over at convenient places, which will have a beautiful effect, and serve for communication with the opposite divisions, on each side of the rivulet.

Cascades, and other water-falls, have also a fine effect, where there are a constant plentiful stream, and the situation proper to give the water a due fall, from a higher to a lower part, upon a parcel of rugged stones, to increase the noise, and break and disperse the water.

In some grounds, by their natural situation, water may be obtained at a moderate expense; as sometimes a contiguous vale, or meadow, bounded by rising ground, and with a brook or rivulet constantly running through it, may be easily thrown into the most agreeable form; and sometimes large springs issuing from an upper ground, and running down a moderate descent between two rising grounds, to some vale below, may either form one entire lake, &c. or contrived, by making proper heads at distances, to form several lakes strung together, as it were, one above another, up to the beginning of the spring; each head may form a beautiful water-fall, or cascade; having the rising grounds on each side embellished with clumps of plantation.

Lakes and artificial rivers may also be contrived in a flat or level ground, where there are any contiguous brooks that can be conducted to supply them with water.

All pieces of water should generally be contrived in a natural imitation, as much as the situation will admit; and its boundary on all sides should be grass ground to some considerable width, sloped off as easy as possible, corresponding with the other adjacent grass ground, to admit of a prospect of the water at some distance.

On the verges of large compartments of water, some Babylonian, or Weeping Willows disposed in particular situations, singly at distances, sometimes in concave and projecting parts, terminations, &c. will have a very agreeable effect in their long, bending, arched branches, and numerous pendulous shoots,

shoots, suspended over the water, in a loose waving manner, sometimes sweeping the surface thereof; and when arrived to some considerable growth in their numerous low pendent branches, suspending all around, display an air of peculiar solemn grandeur.

The various compartments of ground intended for the different plantations, should be digged or trenched for the reception of the plants; particularly for all plantations of shrubbery, wilderness quarters, flower compartments, &c. and the ground for clumps should be raised above the common level, in a gentle swell; especially all detached compartments, such as shrubbery clumps, and flower partitions; and most other detached compartments of ground for any kind of ornamental plantation in gardens, should generally be raised in a moderate rounding swell, gradually from each side to the middle; or for any continued side plantation it may be raised in a gentle slope; for the swelling and sloping figure always strikes the eye the most agreeably, as well as shows the plants to the best advantage.

But where intended to have groves of stately trees, or any straight ranges of trees, either singly, or double lines, forming a walk or avenue, it is most in character to dispose them all on grass ground; in which they will appear the most rural and beautiful.

Likewise elegant ornamental trees, both as single standards, and in detached groups, or clumps, appear the most beautiful when disposed on spacious openings of grass ground.

However, for all kinds of shrubbery and wilderness plantations, &c. the compartments should generally be dug ground, as before observed.

All the plantation compartments of shrubbery, wilderness, &c. should be planted with some considerable variety of different sorts of trees, shrubs, and flowers, artfully disposed in varied arrangements; the taller behind, the lowest forward, and the different sorts so intermixed, as to display a beautiful diversity of foliage and flowers, disposing the more curious kinds contiguous to the principal walks and lawns.

For a list of the different sorts of trees, shrubs, &c. proper for embellishing the several divisions, see DECIDUOUS TREES, and EVERGREENS.

Observing, that as the trees and shrubs are of two different tribes, deciduous and evergreen kinds, those of each tribe should be mostly planted in separate clumps, in which they will effect the most agreeable variety; and in some places may exhibit clumps com-

posed of both sorts, to cause the greater diversity; and many of the most conspicuous deciduous compartments may be embellished towards the fronts, with some showy ever-greens thinly dispersed; which will appear ornamental and lively in winter, when the deciduous plants are destitute of leaves. In planting the several shrubbery clumps, &c. some may be entirely of trees; but the greater part an assemblage of trees and shrubs together; some entirely of the low shrub kind, in different situations, between and in front of the larger growths; likewise should intersperse most of the shrubbery and wilderness compartments with a variety of hardy herbaceous flowery plants, of different growths; having also here and there clumps entirely of herbaceous perennials: the distribution or arrangement of the clumps, and other divisions of the different kinds, both trees, shrubs, and flowers, should be so diversified, as to exhibit a proper contrast, and a curious variation of the general scene.

And in the disposing the various trees, shrubs, and other plants in their respective compartments, observe somewhat in the quincunx way, not exactly so, nor in regular ranges; and for the most part, place the tallest towards the middle or back part, and the lower forward towards the front, according to their natural stature of growth; observing also to intermix the different sorts in each clump, &c. in such order, as to display a diversity of different foliage and flowers, as aforesaid, as well as exhibit a conspicuous variety. Likewise placing the various sorts at such proportionable distances and dispositions, according to their various growths, as each may have full scope to spread its head; and so as the prospect of one may be no interruption or impediment to the growth and appearance of another, but all so judiciously arranged as to set off each other and appear distinct to proper advantage from the contiguous lawns, walks, and other divisions. See PLANTATION.

Observe, in planting any continued or running plantation where shady walks are designed, that particular care is requisite in arranging a due share of the taller trees and shrubs nearer the walks and in such order as to produce the desired effect, particularly in the continued plantation of shrubbery work around the outward boundary, and on the boundary of the lawn and other running plantations, through which serpentine walks are carried: planting many tall-growing trees and shrubs more or less towards the walk in such arrangement as to produce proper shade, shelter, and private walking, with occasional openings

openings and closing at intervals, as hath been already observed; interspersing also many smaller shrubs and hardy herbaceous plants between the larger growths; disposing the whole so judiciously as to afford also a source of variety in the excursion of the walks.

These plantations for shady walks are highly necessary to retire to occasionally, for shelter from the injuries of the weather: they afford shade from the scorching rays of the summer's sun, shelter from tempestuous winds and cold blasts, and for private walking when required. But where very close and gloomy shade is required in any particular parts for diversity, some trees and tall shrubs should be arranged nearer to the verge of the walks, backed and fronted with others, and a variety of hardy shrubs, in such order as to produce the proper effect.

In planting groves and avenues, they should be composed principally of the tree kind, and such as are of straight and handsome growth, with the most branchy, full, regular heads, and may be both of the deciduous and ever-green tribe; but generally arranged separately; which, for groves and avenues, should always be in some considerable open space, formed into grass-ground, either before or after planting the trees; and in planting the groves, it is most eligible to arrange the trees in lines, in some places straight rows, others in gentle bendings, or easy sweeps, having the rows at some considerable distance that the trees may have full scope to display their branchy heads regularly around; and in some places may have close groves to form a more perfect shade. And as to avenues and walks of trees, they may be formed either entirely of deciduous trees, or of ever-greens; but the deciduous kinds are in most estimation for forming fine avenues: however, avenues and grand grass-walks, planted with beautiful ever-green trees, make a fine appearance. In both the sorts, the trees are most commonly disposed in straight rows, one on each side of the avenue, though sometimes grand walks of trees may be both in single straight lines and in double rows, to exhibit the greater variety, planting the trees generally, both in the avenues and walks, at proper distances, to have full scope to branch out regularly around and display their beautiful heads. See AVENUES, GROVES, &c.

But thickets may be composed of all sorts of hardy deciduous trees, planted close and promiscuously, and with various common shrubs dispersed between the trees, as under-woods, to exhibit a more or less thicket occasionally in different parts.

Thickets may also be of ever-green trees, particularly of the pine and fir kinds.

Straight rows of beautiful ever-greens, as pines, firs, cypress, cedars, &c. forming magnificent walks, are very ornamental.

In some open spaces of grass-ground, such as spacious open lawns, or other considerable opens in parks, &c. should dispose some of the most beautiful trees and elegant shrubs detached, both separately as standards or single objects; and in groups or assemblages, from two or three to five or ten or more in different groups or clumps; some irregularly, others in curves, straight lines, &c. for variety, arranging both single standards, and groups a considerable way asunder, not to obstruct the prospect, and at such varied distances as if they had grown there by chance.

It sometimes happens that on the spot or tract of ground which is designed for a Pleasure-ground are found large old trees of considerable standing, properly situated to be introduced into the design, sometimes in proper assemblage for constituting a grove or a thicket, and some as single standards, groups, or clumps, &c. which will prove a considerable advantage; and should be preserved with the utmost care, as it would probably require an age or two to form the like with young plantations; and although the trees should stand ever so close, or irregular and straggling, they, with proper address of thinning or regulating where necessary, may be retained for purposes as above, so as to have a fine effect. See GROVES, &c.

A commodious space for a flower-ground, distinct from the other divisions as formerly hinted, is most necessary for the culture of the more curious and valuable kinds of flowers.

This principal flower-ground forming a distinct division, exclusive of the other flower compartments distributed in different parts in contrast with the shrubby clumps, &c. should be allotted for a choice collection of the finest kinds of both bulbous and fibrous-rooted flowers. The form of this ground may be either square, oblong, or somewhat circular; having the boundary of the division formed by an arrangement of a curious shrubbery, embellished with a collection of the most beautiful flowering shrubs; and the interior part should be divided into many narrow compartments, either in the manner of a parterre, formed into straight borders, beds, &c. edged with box (see PARTERRE); or divided into plain four feet wide beds arranging parallel, having two-feet wide alleys between bed and bed;

bed; in either method having a walk carried all round next the outer boundary, then a border surrounding the whole division, and within this have the various division of beds, &c. as above, raising them generally in a gently rounding manner, highest in the middle, and edge the compartments principally with dwarf-box, and some with thurst and pinks by way of variety, laying the walks and alleys with the finest gravel.

In this division you may deposit the finest hyacinths, tulips, polyanthos-narcissus, jonquils, ranunculus, anemones, and all the other more curious, hardy, bulbous, and tuberous-rooted flowers; each sort principally in separate compartments, especially of the choicer kinds; which being necessary both for distinction sake and for the convenience of giving them occasional protection from inclement weather; but for particulars, in respect to the sorts, method of planting, and general culture, see the respective articles under their proper genera.

Likewise in this division should be planted a curious collection of the finest fibrous-rooted flowery plants, as carnations, polyanthus, auriculas, and many other curious sorts, arranging some of the most valuable in beds separately: others may be dispersed in different compartments, forming an assemblage of various sorts.

In other compartments may exhibit a variety of all sorts, both bulbous and fibrous-rooted kinds.

In some spacious Pleasure-grounds, various buildings and erections are introduced as ornaments to particular departments. For instance, light ornamental buildings, as temples, a banquetting-house, bowers, alcoves, grottoes, rural seats, cottages, fountains, obelisks, statues, and other edifices and devices, are often introduced in different parts in openings between and contiguous to the divisions of plantation and termination of grand walks, &c. Some of these kinds of ornaments, however, being expensive, are rather sparingly introduced; sometimes a temple is presented at the termination of a grand walk or opening, or sometimes a temple, banquetting-house, or bower is stationed in the centre of some spacious opening of grass-ground in the internal divisions; other parts present alcoves, bowers, grottoes, rural seats, &c. at the termination of different walks or openings, and with rural seats placed in different opens or breaks by the sides of long walks, under shade of trees, for places of rest, &c. Fountains and statues are generally introduced in the middle of spacious opens; statues are also of-

ten stationed at the termination of particular walks; sometimes in woods, thickets, and recesses, upon mounts, terraces, and other stations, according to what they are to represent.

Sometimes also there are exhibited root-houses, rock and shell-work, ruins, and other rustic devices, representing hermitages, caves, and the like; being generally stationed in some retired or private situation, and as these kinds of buildings being arched or vaulted, they are commonly covered with a coat of earth and turfed with grass, so as to appear like a sort of mount, hillock, or knoll, and planted with some little clumps of shrubs, &c. having private walks leading to the entrance.

Likewise in some parts is exhibited artificial rock-work, sometimes contiguous to some grotto, fountain, rural piece of water, &c. and planted with a variety of saxatile plants, or such as grow naturally on rocks and mountains.

Ornamental bridges over artificial rivers, or any rural pieces of water in some magnificent opening, so as to admit of a prospect thereof at some distance from the habitation, have a fine effect.

General Culture of the Ground.

With respect to the general culture of this ground, neatness must be ever observed in every part; the walks, lawns, shrubbery, clumps, &c. and the several compartments of trees, shrubs, and flowers, kept duly furnished with a proper stock of the various plants.

The gravel-walks must always be kept free from weeds and all sorts of litter, and should be rolled twice or three times a week in summer, particularly the principal walks, but never less than once a week; previously trim the edges close when necessary, especially if verged with grass-ground; pulling out all weeds, and lightly sweeping off all loose litter; and then roll them well with an iron or stone roller. The rolling in summer should be occasionally performed immediately after showers of rain, particularly the first after any continuance of very dry weather, to settle all the loose parts compact and smooth: in winter, the rolling should also be occasionally performed; observing, it is improper to break up the walks in that season in rough ridges as often practised, to remain in that unlighty manner till spring, whereby the walks are rendered useless at a time when there is hardly any dry or sound walking upon grass or other parts, besides their having a disagreeable slovenly appearance; I would therefore advise to have the walks remain undisturbed, at least till spring, when, if the surface is foul,

or mossy, they may be broken up, and turned the surface to the bottom, and the bottom to the top; directly tread, rake, and roll them smooth, proper for walking on. See GRAVEL WALKS.

All the principal grass lawns and walks within the limits of the Pleasure-garden should also be kept perfectly neat by frequent mowing in summer, to keep the grass short, close, and fine, like a fine pasture down or common; likewise poling it frequently with a long pole to scatter the worm-casts of earth which so greatly deface all grass; and give also occasional rolling both to clean up the scattered worm-casts to make the surface clean, and to render it firm and smooth. The poling and rolling of grass, where kept short in a close surface, should occasionally, in summer, be performed a day or two previous to mowing, whereby the mowing will be more easily, expeditiously, and effectually performed; observing, the mowing of grass-ground within the limits of the principal Pleasure-garden and home lawns, &c. will be necessary about once a week or fortnight, from March or April until September or October, choosing always dewy mornings, or moist weather, for this work, being careful to have each mowing performed with an even hand, not to score or leave the mark of the scythe at each stroke, which has a most disagreeable appearance; and directly after mowing sweep up all the swarths of grass as clean as possible into heaps and carry them away. See GRASS.

But rolling the grass should also be occasionally performed, sometimes with a heavy roller, at intervals, between the times of mowing, in order to continue the surface always firm, even, and of a close, smooth appearance.

In considerably extensive Pleasure-grounds, and large extended lawns, walks, &c. the rolling is sometimes done by horses, having a very large roller, furnished with horse-shafts; and the horses' feet occasionally muffled, especially when the ground is rather softish, to prevent their cutting the surface of the grass in holes.

Where numerous wild daisies deface the grass in May or June, as is sometimes the case, even often in a day after mowing, they may be headed down at a great rate with an old broad sword fixed in the end of a long pole.

Likewise keep all grass-ground clean from litter, such as fallen leaves of trees, &c. which may be expeditiously effected by a light broom or besom on a long handle. See BROOMS.

The edges of all principal grass-walks and those of grass-ground, next to gravel-walks in

particular, should always be kept close and even; which once a year in spring, when the gravel-walks are to be turned and new-laid, may be previously cut even slightly with an edging iron: after this, during the summer, they may be trimmed occasionally as the grass grows rank, either with the points of the garden-shears, with a pair of sheep-shears, or with the point of a knife; for if these edges are not kept close and even they have a slovenly appearance.

The shrubbery plantations should generally all be suffered to take their own natural growth, and branch out into full heads, only just giving a little occasional trimming to any very irregular growths, such as retrenching or reducing any very luxuriant rude shoots, or considerable ramblers, running wildly from all the other branches, and cut out all dead wood: likewise, for the general part, keep all the shrubs from interfering or intangling with one another, by shortening occasionally any straggling or rambling interfering branches, so as the head of each shrub may appear distinct, in which they will show themselves to proper advantage, and effect a more distinguishable variety.

Likewise in tree plantations some occasional pruning will also be sometimes necessary; such as trimming up the stems from low lateral branches, and pruning casual very irregular boughs above, long run-away ramblers, and very low overhanging branches of the head, reduced to order, either by lopping some more or less, or others cut clean out to their origin, as it may seem necessary; performed any time from the fall of the leaf in November till March; always cutting out decayed wood at any season when discoverable.

Observing, the best general season for performing those occasional regulations of pruning is, for the deciduous kinds, any time in winter or spring, when destitute of leaves, especially for any general trimming; though in particularly rambling growths, any time in summer, may also be pruned to order in that season, as required: but for the ever-green kinds, the most eligible season to give any principal pruning, is either summer, autumn, or in spring, about March or April, especially when any considerable trimming or cutting in may be occasionally required, as if performed in winter or very sharp weather, by laying the more interior tender parts immediately open to the cold, it often injures the leaves and young shoots; however, where only a little retrenching or shortening here and there a rambling shoot is necessary, it may be performed almost any time to any of the sorts;

but remarking, both of the deciduous and ever-green kinds, that when any general trimming is occasionally required throughout the different plantations, it is highly proper to perform it at the above-mentioned seasons, previous, in shrubberies, to giving the annual digging to the ground between the shrubs, &c. as directed below.

Where close thickets, however, are intended, no regulation in shrubberies, &c. need be observed, but let the various sorts run promiscuously.

The ground of the principal shrubbery plantations, in which the shrubs stand distant, not covering the surface, should generally be digged every year, in winter or spring; previously giving the shrubs any necessary pruning, as above observed; then dig the ground between neatly, one spade deep, trimming off any rambling suckers or spawn from the roots, leaving the surface of the ground level and smooth: this operation gives health and vigour to the plants, kills weeds, and gives the place an air of culture, and a lively neat appearance.

After this general digging the clumps, &c. the ground must be kept clean from weeds all summer, by occasional hoeing in dry weather, which with a Dutch scuffing-hoe may be expeditiously performed. See HOE and HOEING.

Great care is requisite to support with sticks all such plants as require it, particularly all such of the herbaceous tribe that are liable to be overturned by the wind, weight of wet, &c. for there is great merit in preserving all tall plants in an upright posture.

Keep likewise all the flower compartments in neat order by an annual digging, in autumn, winter, or spring; hoeing in summer to destroy weeds; at each hoeing always rake the surface smooth, particularly the principal borders and other compartments: likewise, according as the various plants grow up, let such as need support have sticks placed to preserve them upright; and as they have done flowering and their stalks decay, cut them down close, clearing off also all decayed leaves, and other rubbish, from time to time as they appear; taking up also the roots of curious bulbous flowers, as their leaves and stalks decay; and in autumn, about October or November, it is proper to give a general dressing, by cutting down all remaining decayed stalks, clearing off all weeds and litter, &c. and prepare to dig the ground: observing, if any manure or additional fresh earth is necessary, this is the time to apply it; so digging the ground neatly one spade deep, and then if any kinds of plants or roots are wanted, most of the

hardy kinds may either be planted now or in the spring; and finish with a neat raking, that the whole may lie clean and decent during the winter; and in spring stir the ground a little with a hoe or rake, or such as was not digged in autumn or winter, as above advised, must now be done; and finish putting in such plants that were omitted in autumn; then rake the ground smooth that every part may assume a fresh, neat, cultivated appearance in the spring and summer seasons.

All kinds of hedge-work and detached trained figures of ever-greens, should be shorn or clipped annually in summer with garden shears; but to keep them perfectly neat, twice every summer is necessary, the first in June, and the second in August or September. See HEDGES.

Also all edgings of box, &c. to walks, borders, and beds, should always be neatly clipped once or twice every year in summer; but to have them extremely neat, they should be clipped twice in that season, i. e. in May or June, and in August, or September, choosing principally moist weather, if possible, for if cut in very dry hot weather, the leaves change brown and unsightly: the same also happens if clipped in winter, or early in spring, while cold weather and frosty nights prevail, so should cut these edgings principally in summer. See BUXUS, article *Dwarf-box for edgings*.

All other edgings of thrift, pinks, daisies, London-pride, &c. should also be kept cut in on each side, every summer after the flowers are past, to keep them neat, and within due bounds, performing it in moist weather, as observed of the box edgings; likewise edgings of under-shrubby aromatics must have the operation of clipping annually performed at sides and top in summer: for all edgings should be kept low, narrow, and regular, otherwise they will appear clumsy and unsightly. See EDGINGS.

Likewise where edgings of box, thrift, daisies, &c. have become very disorderly, or grown rude, out of proper compass, or in any other considerable irregularity, they should, at a proper opportunity, be taken up, slipped, and replanted in regular order.

For particulars relative to the general culture of the various trees, shrubs, and flowers, see their respective genera.

Of Ancient Designs.

Designs, in ancient gardening, for a Pleasure-ground consulted uniformity in every part, exact levels, straight lines, parallels, squares, angles, circles, geometrical figures, &c. all corresponding in the greatest regularity, to effect an exact symmetry and proportion.

Straight

Straight walks were every where observed, and all arranged parallel, and crossing one another in regular intersections; generally a grand one of gravel was extended in a straight line immediately from the front of the main-house, having each side verged either with a regular straight border of earth, furnished with a variety of flowers, &c. and sometimes having a verge of grass three or four feet wide, then a border embellished as above with various plants; this main walk being often intersected by others at regular distances, so as sometimes to divide the space immediately in the front of the house into four, six, or more equal squares, some of which were sometimes formed into parterres, sometimes only naked grass-plats, or other uniform divisions; and often the whole garden was thus divided by straight, parallel, and intersecting walks, into many regular squares and angles, without any variation.

Grand parterres were very commonly presented immediately on the front of the main house, having a grand walk of grass or gravel directly from the house through the middle, or dividing the parterre ground into two divisions. See **PARTERRE**.

In the more interior parts, large tracts of ground were frequently divided by straight grass walks into many square and angular divisions of wilderness, each division surrounded by regular hedges of various kinds of trees and shrubs, kept in uniform order by an annual clipping; having the interior part of each quarter planted with trees and shrubs, which however were in a manner concealed by the hedges from persons in the adjacent walks, so that hardly any thing but close edges, the same thing over again, appeared to view, on each side of the walks; and all the walks generally led into uniform openings of grass, particularly to a grand circle or octagon, forming some central part.

Frequently there were partitions of regular hedge-work, particularly of ever-greens, surrounding large squares of grass ground, designed as pieces of garden ornaments, the hedge-work being often formed into various uniform devices; such as pilasters, arcades or arches, porticoes, galleries, amphitheatres, pavilions, cabinets, bowers, pediments, niches, and cornices; likewise regular arbors, having the sides formed into arcades, and sometimes the top vaulted; and with various other formal imitations, all performed in hedge-work, which were often so arranged and trained, as to effect an air of grandeur and art. High hedges were also in great repute, as boundaries to grand walks and avenues, sometimes

carried up from fifteen or twenty, to thirty or forty feet high; sometimes trained perfectly close from the very bottom to top, others open below a considerable way, and formed into regular arches, &c. all of which sometimes appeared magnificent and ornamental, but were troublesome and expensive to keep in order, on account of their great height: however, all sorts of hedge-work was generally esteemed so ornamental in ancient gardening, that almost every division was surrounded with regular hedges of one sort or other, presenting themselves to view in every part, shutting out all other objects from sight; but in modern designs hedges are rarely admitted; every compartment of plantation being left open to view from the walks and lawns, to have a full prospect of the various trees, shrubs, and flowers, which consequently are more beautiful than continual ranges of close hedges; but for the sake of variety, a little ornamental hedge-work might still be introduced in some particular parts of the ground. See **HEDGES**.

Wildernesses were always designed with the greatest uniformity, the ground being divided by walks into many squares and angles, all corresponding, and all the walks straight, and the principal ones all leading to some common centre or opening, &c. with all the quarters or divisions commonly surrounded with close hedges, as before observed.

Labyrinths or mazes of hedge-work, in the manner of a wilderness, also prevailed in many large gardens. See **LABYRINTH**.

Detached trained figures of ever-greens, as yew, cypress, juniper, holly, box, and various other close-growing ever-green plants, but principally yew, were also very predominant in ancient designs, and generally disposed in regular ranges along the borders and other verges of grand walks; being trained by clipping into various formal shapes, as pyramids, obelisks, columns, &c. in a variety of forms, with other formal figures, all placed in the most exact arrangement. Some also were often placed singly in the midst of some circle, octagon, or other open space, and were all kept in order by clipping once or twice every summer, and were considered as great ornaments.

Straight rows of the most beautiful trees, forming long avenues and grand walks, were in great estimation, which, though not often admitted in modern designs, were formerly considered as great ornaments, and no considerable estate and eminent Pleasure-ground were without several of them; but modern planners rarely introduce straight ranges of

trees for avenues or walks, but even often demolish old ones of a century or two standing, as being thought too formal; however, ranges of trees, forming spacious avenues, &c. about extensive grounds, always give an air of grandeur and dignity to the premises.

Regular grass slopes also greatly prevailed in most old gardens, as ornaments to particular divisions; sometimes were formed at the beginning of some rising ground, also sometimes at the termination, and frequently some low ground, canals, and other formal pieces of water, were bounded by a range of regular grass slopes; likewise, regular grass slopes formed the sides of terraces and other rising grounds. Moderate grass slopes also often formed a boundary to some open spaces, as a bowling-green, flower-garden, &c. forming a sort of terrace all round, having sometimes a gravel-walk at top; these slopes were always formed with the greatest regularity and exactness, which in some situations were very ornamental. They were of various dimensions in respect to height, from one foot to ten or twenty high, according to the nature of the situation and purpose they were designed for, in different parts; and some being ranged singly, others double, treble, or several one above another, on the side of some considerable rising ground, in a theatrical arrangement.

Regular terraces, either on a natural eminence or of forced ground, were also introduced for ornament, and for the sake of prospect, and of enjoying the fresh air in summer.

But as the above taste in the ancient style of designing gardens, being generally crowded every where with exact uniform divisions and formal figures, and the same thing often prevailing in almost every part, that even gardens of very considerable extent afforded very little variety; and the perpetual show of stiff formality of the same thing over again, together with the numerous surrounding hedges in every division, obtruding constantly upon the sight, obstructing that of other objects, becoming, at last, in a manner disgusting and unentertaining in the general appearance, to persons of taste and observation, most designs of that kind have been gradually discontinued and abolished from our principal English gardens; old gardens demolished and new modernised, often running into the contrary extreme in modern designs, by excluding all formal regularity and uniform appearances, and substituting various dissimilar arrangements in the general plan, in the formation of the different compartments in fancied imitations of natural rurality, as much as possible, as before observed.

However, for the sake of diversity, some of the more elegant regular works might still be admitted sparingly, in particular divisions, in contrast with the general rural performances, so as in some places to exhibit a grand straight gravel or grass-walk, in others a parterre, and in some places straight rows of the most beautiful trees, forming walks and avenues, and sometimes a range of hedge-work, and here and there a pyramid, &c. of some detached trained ever-greens; and sometimes a regular grass slope, formal terrace, &c. all of which, if judiciously disposed, might assist in diversifying the general scene.

PLENUS Fls, a full or most double flower; a flower having the greatest plenitude or multiplicity of petals, often to the diminution or entire exclusion of the parts of fructification.

Perfectly Full Flowers, whose multiplicity of petals obliterate the generative organs, consequently prove barren, *i. e.* rarely ever producing seed; but mostly all Full Flowers are varieties of singles, which are always the original species; so that the singles and half-doubles only produce the seed, and from which both double and single flowers are obtained; however, the full double flowers are esteemed the most beautiful, and are often the florist's and gardener's pride.

But all flowers of the above luxuriant nature are commonly called double flowers; observe, however, a Full Flower is to be considered as the highest degree of luxuriance or plenitude, as the petals are generally multiplied in many series to the very centre, so as frequently to choak up all the male and female organs, as sometimes happens in carnations, ranunculus, anemones, &c. a double flower, properly so called, may be said to have its series of petals only twice repeated; however, among gardeners and florists, all multiplied flowers, whether their petals are repeated but twice, thrice, or many times, are commonly all denominated double flowers, and are generally in the greatest estimation, as being the most delightful to the eye, in the opinion of gardeners, to cultivate for ornament.

But although full and double flowers are often the most beautiful to the eye, as just observed, yet they are to be considered as an unnatural increase and monstrous production; by Linnæus called vegetable monsters, because double flowers are only varieties of singles, varying by culture from their natural single or *characteristic* state; for the *characters* of the genera are always drawn from single flowers, never from full or double ones, whose number of petals often vary more or less by culture,

ture, and are never to be depended on to establish the *characters*.

Full or double flowers therefore, are varieties both of monopetalous and polypetalous flowers; for example, the hyacinth, tuberose, primrose, &c. being all monopetalous, or of one petal only, in their natural or *characteristic* state, yet the increase or repetition of the petals one within another is often continued to the very centre, choaking up the organs of fructification aforesaid; though perfect fullness is less frequent in flowers with one petal than in those with several. Polypetalous flowers therefore, such as carnation, anemone, ranunculus, marsh-marigold, columbine, poppy, pœony, tulip, crown-imperial, &c. all having several petals, are liable to all degrees of luxuriance, from the lowest to the greatest fullness.

The mode of luxuriance is effected either by a multiplication of the division of the limb or upper part of the petal, or of the petals entirely; and in flowers having nectariums, the impletion is often formed by a multiplication of the nectarium, as frequently occurs in columbine, narcissus, larkspur, &c.

Compound flowers are also liable to various degrees of luxuriance; as in African marigold, sun-flower, garden-daisy, feverfew, &c. For an account of this mode of impletion, see *COMPOSITUS flos*.

PLINIA, pedunculated Myrtle.

Comprises an exotic shrub for the stove, garnished with oval leaves and icofandrious flowers.

Class and order, *Icofandria Monogynia*.

Characters.] CALYX, a monophyllous cup divided into four or five parts. COROLLA, five or sometimes but four oval, concave petals. STAMINA, twenty or more capillary filaments, topped with small antheræ. PISTILLUM, a germen within the corolla, awl-shaped style, and simple stigma. PERICARPIUM, a large globose, furrowed drupe, containing large globose smooth seeds.

The species is,

PLINIA *pedunculata*.

Peduncled Brazilian inodorous Myrtle.] Rises with a branching stem, having a whitish bark, broad, oval, shining, opposite, scentless leaves, and naked pedunculi, sustaining solitary flowers with ciliated petals, succeeded by large globose fruit.

This plant flowering here in January and February, when few others are produced, recommends it for ornamenting the stove. It is propagated by seeds procured from abroad, which sow as soon as possible after their arrival in pots of rich mould, and plunge them

in the bark-bed, and they will come up the same season, or they may be increased by cuttings, in May or June, of the young shoots: plant them in pots of good earth, which plunge in the bark-bed, covering them with hand or bell-glasses, and giving occasional waterings, they will be fit to transplant separately the same year.

PLUMBAGO, Lead Wort.

This genus consists of some flowery perennials, of which, one is herbaceous, for the open borders, and the others are ligneous, or under-shrubby plants, for the stove; have fibrous roots, sending up slender stalks, three or four feet high, adorned with oval-spear-shaped leaves, and terminated by clusters and spikes of small monopetalous flowers.

Class and order, *Pentandria Monogynia*.

Characters.] CALYX is monophyllous, tubular, pentagonal, quinque-dentate, and permanent. COROLLA is monopetalous, funnel-shaped, divided above into five oval, spreading segments; and a nectarium of five very small valves, including the germen. STAMINA, five subulated filaments sitting on the nectarium, and small versatile antheræ. PISTILLUM, a very small oval germen, simple style, having a slender five-pointed stigma. PERICARPIUM, none; a single oval seed lodged in the permanent calyx.

There are, in our gardens, about four species, which are the following.

Hardy Herbaceous Kind.

1. PLUMBAGO *europæa*.

European Plumbago.] Hath thick, fibry, descending roots, sending up many slender, channeled stems, branching a yard high; spear-shaped, rough, amplexicaule leaves, and all the stalks and branches terminated by bunches of blue flowers in October.

Varieties.] With purple flowers — with white flowers.

They are all perennial in root, and annual in stalk; natives of Italy, &c. but succeed in the open ground.

Ligneous Stove Kinds.

These are somewhat under-shrubby, and are natives of India and America.

2. PLUMBAGO *zelanica*.

Ceylon Plumbago.] Hath a thick, juicy, acrid root; ligneous, very slender, branchy stalks, rising three or four feet high; oval, smooth leaves, having short foot-stalks; and the branches terminated by spikes of white flowers, appearing great part of the year.

3. PLUMBAGO *rosea*.

Rose Plumbago.] Hath slender ligneous stems, with gibbous or swelling joints; oval smooth leaves, having foot stalks; and all the branches

branches terminated by spikes of red flowers, great part of the year.

4. *PLUMBAGO scandens.*

Climbing American Plumbago.] With flexuose climbing stalks, and petioled, ovate, smooth leaves.

All these plants merit culture, to increase the variety of the flowery tribe; the first sort for the pleasure ground, and the other three to plant in pots, and place in the hot-house collection.

Their propagation is;

The first sort, by parting the roots in autumn, when the stalks decay.

And the second, third, and fourth sorts by seed, in a hot-bed, in the spring: they may also be tried by slips and cuttings, assisted by the same artificial heat.

PLUMERIA, Red Jessamine.

The plants are woody, succulent, flowery exotics, of South America; retained here in our hot-house collections for variety, rising several feet high; ornamented with oval, oblong, and spear-shaped leaves, and beautiful monopetalous, funnel-shaped, five-parted flowers, terminating the branches in clusters.

Class and order, *Pentandria Monogynia.*

Characters.] *CALYX* is small, obtuse, and five-parted. *COROLLA* is monopetalous, infundibuliform, with a long tube, widening upwards, and the top divided into five oblong, oval, erect, spreading segments. *STAMINA*, five awl-shaped filaments, having connivent antheræ. *PISTILLUM*, an oblong, bifid, germen, scarce any style, but a double, acute stigma. *PERICARPIUM*, two long, ventricose, acuminate, nutant, unilocular, and univalvular folliculi, having numerous oblong, imbricated seeds.

The species are;

1. *PLUMERIA rubra.*

Red Plumeria.] Rises with a woody, thick, succulent, branching stem, eight or ten feet high; large oval-oblong leaves, having short, biglandular foot-stalks; and the branches terminated by clusters of elegant, red, odoriferous flowers.

Variety.] With pale-red flowers.

2. *PLUMERIA alba.*

White Plumeria.] Rises with a woody, thick, succulent, branchy stem, eight or ten feet high; spear-shaped, pointed revolute leaves, and the branches terminated by clusters of white odoriferous flowers, with the pedunculi having tuberoso swellings above.

3. *PLUMERIA obtusa.*

Obtuse Plumeria.] Hath a woody, thick, succulent, branchy stem, rising ten or twelve feet high; spear-shaped, short, obtuse leaves;

and the branches terminated by clusters of fragrant white flowers.

4. *PLUMERIA pudica.*

Modest, or closed-flowered Plumeria.] Having all the flowers closed at the border.

All these plants flower here in our stoves, in summer, about July and August, but never produce seeds in England.

They being all exotics of the hot parts of America, require the indulgence of a hot-house all the year in this country; and are retained here in many curious gardens, as plants of variety and ornament, for the beauty of their stems, leaves, and flowers, particularly the latter, which rising in large clusters, make a fine appearance, six weeks or two months in summer, and have great fragrance; but those of the *Red Plumeria* are considerably the most beautiful.

All the three species are of a very succulent quality, both in stem, branches, and leaves; replete with a milky juice of a very caustic and poisonous nature.

As being all of the above succulent temperature, and exotics from the hot parts of the world, they must be potted in light, dry, sandy earth, and placed almost constantly in the stove, and supplied with proper waterings, which, however, as being succulents, must be applied with great moderation, particularly in winter, and they must be shifted occasionally into larger pots.

They are propagated by seeds and cuttings of their branches.

By Seed.—This is procured from the West Indies: sow it in pots of light sandy compost, and plunge them in a hot-bed under glasses, or in the bark-bed in the stove; they will readily grow; and when the plants are two or three inches high, prick them in separate small pots, which plunge also in the bark-bed, &c.

By Cuttings.—Any time in summer, take off some cuttings of the branches, which, previous to planting, as being very succulent, should be laid in the stove, or some dry place, a week, or more, as it shall seem necessary, till the wound made by the amputation from the parent plant is perfectly healed and dried over, to prevent their rotting; then plant them in pots of light dry earth, and plunge them in the bark-bed, giving occasional shade from the mid-day sun; and very moderate waterings; and they will be rooted in a month or six weeks.

POINCIANA, Barbadoes Flower-Fence, or Spanish Carnation.

It consists of shrubby flowering exotics of the Indies, proper for our hot-house collections; of upright branchy growth, garnished with decomposed pinnated leaves; and the branches

branches terminated by long spikes of beautiful pentapetalous flowers.

Class and order, *Decandria Monogynia*.

Characters.] CALYX, five oblong, concave, deciduous leaves. COROLLA is pentapetalous, four of the petals roundish, and nearly equal, and the fifth is larger, deformed, and crenated. STAMINA, ten very long, bristly, declinated filaments, having oblong antheræ. PISTILLUM, a long, awl-shaped, declinated germen, long style, and obtuse stigma. PERICARPIUM, an oblong compressed pod, having tranverse partitions, containing many plane nearly oval seeds.

The species are,

1. *POINCIANA pulcherrima*.

Fair Poinciana, or Double-spined Barbados Flower-Fence.] Hath a shrubby, upright, straight stem, branching ten or twelve feet high, armed with double spines, at each joint; large decompound, pinnated leaves, of numerous, oblong, obtuse folioles; and the branches terminated by long loose spikes, of large golden-yellow, beautifully variegated flowers.

2. *POINCIANA bijuga*.

Bijugated Single-spined Poinciana.] Rises with a shrubby, upright, straight stem, dividing into spreading branches, armed with short single spines; decompound pinnated leaves, of numerous, roundish, emarginated lobes; and the branches terminated by loose spikes, of yellowish purple flowers.

3. *POINCIANA elata*.

Loftier Spineless Poinciana.] Hath a shrubby, spineless stem and branches; bipinnated leaves, of many small oblong, oval, entire lobes; and loose spikes of flowers, having leathery cups, and very long, dark purple filaments.

These beautiful shrubs flower here in our stoves, in autumn, or beginning of winter, very ornamentally, imparting an agreeable fragrance; and are sometimes succeeded by ripe seed in England.

As they are exotics of both Indies, they must be always kept in pots, and placed constantly in the hot-house.

Their propagation is by seed, which we receive annually from the West Indies. Sow it in pots of light earth, and plunge them in any hot-bed, or in the stove bark-bed; they will soon come up abundantly, which when about three or four inches high, prick them into separate small pots, plunging them also in the bark-bed, till larger, giving occasional waterings, and they will make great progress.

As they advance in growth, shift them with balls into larger pots; and grant them supplies of water, plentifully in summer, but

always very moderate in winter. Thus they will grow freely, advance fast in height, and in a few years begin to exhibit their elegant flowers.

POLEMONIUM, Greek Valerian, or Jacob's Ladder.

The plants are herbaceous, fibrous-rooted, flowery perennials, for the pleasure-ground, sending up annual stalks from about ten or twelve, to eighteen inches high, adorned with pinnated leaves, and terminated by bunches of monopetalous, rotated, five-parted flowers.

Class and order, *Pentandria Monogynia*.

Characters.] CALYX is monopetalous, five-parted, and permanent. COROLLA is monopetalous and wheel-shaped, divided at top into five parts. STAMINA, five short inclined filaments, having roundish antheræ. PISTILLUM, an oval acute germen, filiform style, and a trifid revolute stigma. PERICARPIUM, a three-cornered, trivalved, trilocular capsule, having many irregular seeds.

The most noted species are,

1. *POLEMONIUM caruleum*.

Blue Greek Valerian, or common Jacob's Ladder.] Hath fibrous roots, crowned by a cluster of pinnated, many-lobed leaves, and upright, channeled, hollow stalks, about half a yard high; garnished with pinnated leaves, of several pair of alternate lobes, terminated by an odd one; and the stalks terminated by clusters of blue flowers, having the calyx larger than the corolla.

Varieties.] White-flowered — variegated-flowered — woolly-cupped.

2. *POLEMONIUM reptans*.

Creeping Greek Valerian.] Hath very creeping roots, upright branchy stalks, about a foot high, pinnated leaves, of several pair of narrow alternate lobes; and the stalks terminated by bunches of light blue flowers, nodding or drooping downwards.

Both the species flower in May and June; the flowers are always collected into bunches; and are succeeded by plenty of seed in autumn.

These plants are hardy: the first grows wild in thickets, in some parts of England, and other parts of Europe; and the second in Virginia; and both the sorts are cultivated in gardens for ornament, in the flower-compartments of the pleasure-garden; are abiding by the roots, and send up stalks annually in spring, for flowering.

Their propagation is by seed, and by parting the roots; but the seedlings are generally the finest plants: parting the roots, however, is the only certain method to continue the

branches terminated by spikes of red flowers, great part of the year.

4. *PLUMBAGO scandens*.

Climbing American Plumbago.] With flexuose climbing stalks, and petioled, ovate, smooth leaves.

All these plants merit culture, to increase the variety of the flowery tribe; the first sort for the pleasure ground, and the other three to plant in pots, and place in the hot-house collection.

Their propagation is;

The first sort, by parting the roots in autumn, when the stalks decay.

And the second, third, and fourth sorts by seed, in a hot-bed, in the spring: they may also be tried by slips and cuttings, assisted by the same artificial heat.

PLUMERIA, Red Jessamine.

The plants are woody, succulent, flowery exotics, of South America; retained here in our hot-house collections for variety, rising several feet high; ornamented with oval, oblong, and spear-shaped leaves, and beautiful monopetalous, funnel-shaped, five-parted flowers, terminating the branches in clusters.

Class and order, *Pentandria Monogynia*.

Characters.] *CALYX* is small, obtuse, and five-parted. *COROLLA* is monopetalous, infundibuliform, with a long tube, widening upwards, and the top divided into five oblong, oval, erect, spreading segments. *STAMINA*, five awl-shaped filaments, having connivent antheræ. *PISTILLUM*, an oblong, bifid, germen, scarce any style, but a double, acute stigma. *PERICARPIUM*, two long, ventricose, acuminate, nutant, unilocular, and univalvular folliculi, having numerous oblong, imbricated seeds.

The species are;

1. *PLUMERIA rubra*.

Red Plumeria.] Rises with a woody, thick, succulent, branching stem, eight or ten feet high; large oval-oblong leaves, having short, biglandular foot-stalks; and the branches terminated by clusters of elegant, red, odoriferous flowers.

Variety.] With pale-red flowers.

2. *PLUMERIA alba*.

White Plumeria.] Rises with a woody, thick, succulent, branchy stem, eight or ten feet high; spear-shaped, pointed revolute leaves, and the branches terminated by clusters of white odoriferous flowers, with the pedunculi having tuberosc swellings above.

3. *PLUMERIA obtusa*.

Obtuse Plumeria.] Hath a woody, thick, succulent, branchy stem, rising ten or twelve feet high; spear-shaped, short, obtuse leaves;

and the branches terminated by clusters of fragrant white flowers.

4. *PLUMERIA pudica*.

Modest, or closed-flowered Plumeria.] Having all the flowers closed at the border.

All these plants flower here in our stoves, in summer, about July and August, but never produce seeds in England.

They being all exotics of the hot parts of America, require the indulgence of a hot-house all the year in this country; and are retained here in many curious gardens, as plants of variety and ornament, for the beauty of their stems, leaves, and flowers, particularly the latter, which rising in large clusters, make a fine appearance, six weeks or two months in summer, and have great fragrance; but those of the *Red Plumeria* are considerably the most beautiful.

All the three species are of a very succulent quality, both in stem, branches, and leaves; replete with a milky juice of a very caustic and poisonous nature.

As being all of the above succulent temperature, and exotics from the hot parts of the world, they must be potted in light, dry, sandy earth, and placed almost constantly in the stove, and supplied with proper waterings, which, however, as being succulents, must be applied with great moderation, particularly in winter, and they must be shifted occasionally into larger pots.

They are propagated by seeds and cuttings of their branches.

By Seed.—This is procured from the West Indies: sow it in pots of light sandy compost, and plunge them in a hot-bed under glasses, or in the bark-bed in the stove; they will readily grow; and when the plants are two or three inches high, prick them in separate small pots, which plunge also in the bark-bed, &c.

By Cuttings.—Any time in summer, take off some cuttings of the branches, which, previous to planting, as being very succulent, should be laid in the stove, or some dry place, a week, or more, as it shall seem necessary, till the wound made by the amputation from the parent plant is perfectly healed and dried over, to prevent their rotting; then plant them in pots of light dry earth, and plunge them in the bark-bed, giving occasional shade from the mid-day sun; and very moderate waterings; and they will be rooted in a month or six weeks.

POINCIANA, Barbadoes Flower-Fence, or Spanish Carnation.

It consists of shrubby flowering exotics of the Indies, proper for our hot-house collections; of upright branchy growth, garnished with decomposed pinnated leaves; and the branches

branches terminated by long spikes of beautiful pentapetalous flowers.

Class and order, *Decandria Monogynia*.

Characters.] CALYX, five oblong, concave, deciduous leaves. COROLLA is pentapetalous, four of the petals roundish, and nearly equal, and the fifth is larger, deformed, and crenated. STAMINA, ten very long, bristly, declinated filaments, having oblong antheræ. PISTILLUM, a long, awl-shaped, declinated germen, long style, and obtuse stigma. PERICARPIUM, an oblong compressed pod, having tranverse partitions, containing many plane nearly oval seeds.

The species are,

1. POINCIANA *pulcherrima*.

Fair Poinciana, or Double-spined Barbados Flower-Fence.] Hath a shrubby, upright, straight stem, branching ten or twelve feet high, armed with double spines, at each joint; large decomposed, pinnated leaves, of numerous, oblong, obtuse folioles; and the branches terminated by long loose spikes, of large golden-yellow, beautifully variegated flowers.

2. POINCIANA *bijuga*.

Bijugated Single-spined Poinciana.] Rises with a shrubby, upright, straight stem, dividing into spreading branches, armed with short single spines; decomposed pinnated leaves, of numerous, roundish, emarginated lobes; and the branches terminated by loose spikes, of yellowish purple flowers.

3. POINCIANA *elata*.

Loftier Spineless Poinciana.] Hath a shrubby, spineless stem and branches; bipinnated leaves, of many small oblong, oval, entire lobes; and loose spikes of flowers, having leathery cups, and very long, dark purple filaments.

These beautiful shrubs flower here in our stoves, in autumn, or beginning of winter, very ornamentally, imparting an agreeable fragrance; and are sometimes succeeded by ripe seed in England.

As they are exotics of both Indies, they must be always kept in pots, and placed constantly in the hot-house.

Their propagation is by seed, which we receive annually from the West Indies. Sow it in pots of light earth, and plunge them in any hot-bed, or in the stove bark-bed; they will soon come up abundantly, which when about three or four inches high, prick them into separate small pots, plunging them also in the bark-bed, till larger, giving occasional waterings, and they will make great progress.

As they advance in growth, shift them with balls into larger pots; and grant them supplies of water, plentifully in summer, but

always very moderate in winter. Thus they will grow freely, advance fast in height, and in a few years begin to exhibit their elegant flowers.

POLEMONIUM, Greek Valerian, or Jacob's Ladder.

The plants are herbaceous, fibrous-rooted, flowery perennials, for the pleasure-ground, sending up annual stalks from about ten or twelve, to eighteen inches high, adorned with pinnated leaves, and terminated by bunches of monopetalous, rotated, five-parted flowers.

Class and order, *Pentandria Monogynia*.

Characters.] CALYX is monopetalous, five-parted, and permanent. COROLLA is monopetalous and wheel-shaped, divided at top into five parts. STAMINA, five short inclined filaments, having roundish antheræ. PISTILLUM, an oval acute germen, filiform style, and a trifid revolute stigma. PERICARPIUM, a three-cornered, trivalved, trilobular capsule, having many irregular seeds.

The most noted species are,

1. POLEMONIUM *caruleum*.

Blue Greek Valerian, or common Jacob's Ladder.] Hath fibrous roots, crowned by a cluster of pinnated, many-lobed leaves, and upright, channeled, hollow stalks, about half a yard high; garnished with pinnated leaves, of several pair of alternate lobes, terminated by an odd one; and the stalks terminated by clusters of blue flowers, having the calyx larger than the corolla.

Varieties.] White-flowered — variegated-flowered — woolly-cupped.

2. POLEMONIUM *reptans*.

Creeping Greek Valerian.] Hath very creeping roots, upright branchy stalks, about a foot high, pinnated leaves, of several pair of narrow alternate lobes; and the stalks terminated by bunches of light blue flowers, nodding or drooping downwards.

Both the species flower in May and June; the flowers are always collected into bunches; and are succeeded by plenty of seed in autumn.

These plants are hardy: the first grows wild in thickets, in some parts of England, and other parts of Europe; and the second in Virginia; and both the sorts are cultivated in gardens for ornament, in the flower-compartments of the pleasure-garden; are abiding by the roots, and send up stalks annually in spring, for flowering.

Their propagation is by seed, and by parting the roots; but the seedlings are generally the finest plants: parting the roots, however, is the only certain method to continue the

the variegated kind, and any other singular variety.

By Seed.—Sow it in spring, in any bed or border of common earth, and rake it in; the plants will soon come up abundantly, which, when two or three inches high, prick out a quantity in nursery-rows, six inches asunder, to remain till autumn; then may be transplanted, where they are finally to remain; and they will flower the following summer.

By parting the Roots.—Autumn, when the stalks decay, or early in spring, before new ones begin to shoot, is the proper time; and is performed in the common way.

POLLEN, Meal, the prolific powder, or fecundating dust contained in the antheræ, or tops of the stamina in flowers.

This Pollen is generally a very fine meal or powder, being the male dust in vegetables, corresponding to the feminal fluid in animals; is very generally of a yellow colour; and being discharged, and dispersed by the bursting of the antheræ, upon the stigma of the pistillum or female organ, impregnates the ovary of the germen, or seed-bud below, which then, in the progress of vegetation, swells, becomes a fruit or seed-vessel, furnished with fertilised or prolific seeds.

The dust in question is very conspicuous in many flowers, as tulip, lily, cucumber, &c. and is supposed to contain a fine liquid substance, not distinguishable by the naked eye, and discharged by elastic force in its dispersion, for the impregnation of the female.

This said Pollen, or male dust, in its fecundating office, is generally effected by nature, for the impregnating the female organs; though it may be proper to remark, that in one particular instance, it is sometimes effected by art, such as in the culture of early cucumbers in frames, in which the impregnation is very generally accomplished by detaching some of the male blossoms, and applying the antheræ, thereof, loaded with its yellow powder, to the stigma of the female or fruit blossom, and a sufficiency of the Pollen adhering thereto, the young fruit under the corolla being then fertilised, it, in two or three days after, will discover its impregnation by its advancing growth.—See CUCUMBERS.

POLYANTHES, Tuberose, or Indian tuberous Hyacinth.

It is an herbaceous, bulbo-tuberous-rooted, beautiful flowery perennial, an exotic of India, rising with annual stalks, three or four feet high, terminated by a long spike of many large monopetalous, six-parted, liliaceous flowers, of great beauty, and delightful fragrance.

Class and order, *Alexandria Monogynia*.

Characters.] CALYX, none. COROLLA is monopetalous, infundibuliform, with an oblong incurved tube, divided above into six oval spreading segments. STAMINA, six thick obtuse filaments, terminated by very long linear antheræ. PISTILLUM, a roundish germen, slender style, crowned by a thick trifid stigma. PERICARPIMUM, a roundish, obtusely trigonal capsule, with three cells, having numerous, plane, semi-orbicular seeds, in a double range.

There is but one species, consisting of some varieties, all of which being exotics of tender quality, requiring aid of artificial heat, under shelter of frames and glasses, or in a hot-house, &c. to bring them to flower in perfection in this country.

The species is,

POLYANTHES *Tuberosa*.

Tuberosa or *Tuberoſe*.] Hath an oblong, bulb-like, tuberous, white root, crowned with a few long very narrow leaves; amidst them an upright, straight, firm stem, three or four feet high, terminated by a long spike of large white flowers, arranged alternately.

Varieties.] Common Tuberose, with single flowers, —double-flowered, —dwarf-stalked, —variegated leaved.

They all flower here in June, July, and August: the flowers are funnel, or bell-shaped; garnish the upper part of the stem, in a long spike, consisting from ten to twenty or more separate flowers, in alternate arrangement; the lower flowers opening first, which are succeeded by those above, in regular order, making in the whole a most beautiful appearance, highly enriched with a most fragrant odour.

The common single-flowered Tuberose is the sort the most commonly cultivated, as it generally blows the most freely, and possesses the finest fragrance.

The double-flowered kind, also highly merits culture, as when it blows fair, it makes a singularly fine appearance.

The dwarf, and the variegated kind, are inferior to the other two, but may be cultivated for variety.

All the varieties being exotics from warm countries, although they are made to flower in great perfection in our gardens, by assistance of hot-beds, they will not prosper in the open ground, and do not increase freely in England; so that a supply of the roots is imported hither annually from Genoa, and other parts of Italy, by most of the eminent nursery and seedsmen, and the Italian warehouse-keepers; generally arriving in February or March, time enough for the ensuing

ensuing summer's bloom; and are sold commonly at the rate of twelve or fifteen shillings per hundred, being careful always to procure as large roots as possible, for on this depends the success of having a complete blow.

They requiring artificial heat to blow them in this country, are planted in pots, and plunged in a hot-bed, under a deep frame, furnished with glass lights; or placed in a hot-house, where they may be blowed to great perfection, with little trouble.

The principal season for planting them is March and April; observing, however, that in order to continue a long succession of the bloom, it is proper to make two or three different plantings, at about a month interval; one in March, another in April, and a third the beginning of May; whereby the blow may be continued from June until September; observing, as above mentioned, they may be flowered either by aid of a common dung, or bark hot-bed, or in a hot-house; and the following are the methods.

First - by common Hot-beds.—In March or April, &c. as above observed, make a moderately substantial hot-bed of dung or tan, in dimensions suitable to any of the deepest hot-bed frames; and when the bed is become of a proper temperature of heat, prepare to put in the roots, previously planting them in pots, as directed below; observing, that if a dung hot-bed, lay in six inches depth of earth, or old tan, in which to plunge the pots, but if of bark or tan, no earth is necessary, as the pots may be plunged immediately into the bark.

The hot-bed being ready, and having procured the roots, and some proper sized pots, twenty fours, one for each root; then having light rich earth, fill the pots therewith; and, after having divested the roots of all loose outer skins, and all off-sets, plant one in each pot, in depth, so as the top of the root be about an inch below the surface of the earth: this done, directly plunge all the pots in the hot-bed close together, or so as the bed may contain the number required; and as soon as they are all thus placed, put on the lights of the frame.

Being thus planted and placed in the hot-bed, observe their culture as follow: admit a portion of fresh air daily, by tilting the upper ends of the lights; but keep them close down on nights: give also moderate waterings, which however apply very sparingly, till the roots begin to shoot; then repeat the waterings moderately as you shall see occasion; likewise observing, that when the shoot be-

gins to advance, to admit fresh air more freely, in proportion, to strengthen the stems, according as they advance in height: and when they have risen near the glasses, it is proper to deepen the frame, either by the addition of another at top, or by raising it at bottom six or eight inches, in order to give the stems sufficient room to shoot to their full stature, repeating this, once or twice, as the growth of the plants renders it necessary, still also assisting them with plenty of water, and a large portion of fresh air daily, either by raising one end of the lights as above-said, or that when the plants are advanced some tolerable height, and the warm season also a little advanced, the lights may be taken away entirely occasionally in fine mild days, which will strengthen and inure them gradually to the full air: but always draw the lights on again towards the evening, or at the approach of a sharp air, cold blast, or heavy rains; observing, towards the middle or latter end of May, or beginning of June, according to the temperature of the season, to begin to expose them fully, only giving occasional shelter in cold nights, or very wet weather, either of the glasses, or mats supported on hoop arches, till they begin to flower, which will be about the middle or latter end of June, or beginning of July; when the plants in their pots may be removed where wanted; either to adorn any of the garden compartments, or any apartment of the habitation.

Place to each plant a tall straight stake; to which fasten the stem for support.

They must still be duly supplied with water all the time of their bloom; they will require it every other day, or oftener, in very hot dry weather.

Observe, as aforesaid, that, in order to continue a long succession of bloom of this flower, two more parcels of roots should be planted at about a month's interval, in April and May, &c. each planting to be in pots, as already directed; and plunged in a hot-bed under shelter of frames and glasses, or an awning of mats every night and cold weather: those, however, planted late in April or in May, will need only a moderate hot-bed, just to let the roots going at first, and will succeed tolerably, with only a protection of hoop arches across the bed, for the support of mats occasionally in cold nights.

Sometimes roots planted in May in the full ground, will shoot tolerably strong, and produce flowers in autumn.

It is however the most eligible way to allow them the assistance of a hot-bed as above, otherwise of a hot-house, as directed below;

for one or other of these aids is the only method by which we can blow these flowers in full perfection.

By assistance of a Hot-house.] Where there is the convenience of a hot-house, we may blow tuberoses in great perfection with very little trouble. Plant the roots any time in spring, March, April, or May, in pots as above advised; and if there is room in the bark-bed, plunge them to their rims; if not, place the pots any where towards the front of the house; but they will shoot more freely if plunged in the bark-bed; give occasional waterings as directed in the hot-bed culture, and they will shoot and flower strong in their due season; and by a repetition of planting a few at three or four weeks interval, you may continue a bloom from April or May, until autumn.

Method of Propagation.

With respect to the propagation of these plants, it is principally by off-sets of the roots.

The blowing roots that are brought annually from abroad, for sale, are often furnished with off-sets, which ought to be separated, previous to planting; those also that are planted here in our gardens, frequently furnish off-sets, fit for separation in autumn when the leaves decay; they must then be preserved in sand all winter in a dry sheltered place; and in the beginning of March, plant them either in a bed of light dry earth in the full ground, or to forward them as much as possible, allow them a moderate hot-bed, and in either method indulge them with shelter in cold weather, either of a frame and lights, or arched with hoops, and occasionally matted; but let them enjoy the full air in all mild weather, giving also plenty of water in dry weather, during the season of their growth in spring and summer.

Thus let them grow till their leaves decay in autumn; then take them up, clean them from earth, and lay them in a box of dry sand to preserve them till spring, at which time, such roots as are large enough to blow may be planted and managed as already directed, and the smaller roots plant again in a nursery-bed, to have another year's growth; afterwards plant them for flowering.

POLYGALA, Milk-wort.

This genus furnishes for our garden collections, several species of herbaceous, and ligneous, under-shrubby perennials, mostly as ornamental flowering plants, for the pleasure-ground and green-house, and of which one in particular is peculiarly valuable in some medicinal applications, all of which rising with slender stalks of moderate growth, from about eight, or ten, to eighteen inches and two

or three feet high, in the different species, adorned with small spear-shaped, oblong, and oval leaves, and large irregular papilionaceous flowers in lateral and terminal spikes in May, June, &c.

Class and Order, *Diadelphia Olfandria*.

Characters.] **CALYX**, a small cup of three oval, acute, permanent leaves. **COROLLA** is papilionaceous, with two large oval, plane wings, placed beyond the other parts, a short tubulous vexillum a little reflexed and bifid at top, and a concave, compressed carina, ventricose towards the apex. **STAMINA**, diadelphous filaments crowned with eight simple antheræ. **PISTILLUM**, an oblong germen, simple erect style, and bifid stigma. **PERICARPIMUM**, a turbinate, heart-shaped, compressed capsule, bivalvous, with two cells, each containing one oval seed.

The most material species are,

1. **POLYGALA vulgaris.**

Common Milk-wort.] Hath a long white root, sending up slender herbaceous stalks, inclining to the ground, six or eight inches in length, narrow spear-shaped, pointed smooth, bright-green leaves; and the stalks terminated by crested spikes of flowers in June, succeeded by ripe seeds in August.

Varieties.] Blue-flowered,—red-flowered,—white—violet-coloured,—striped.

2. **POLYGALA amara.**

Bitter Milk-wort.] With large oval radical leaves, erect herbaceous stalks, six to eight or ten inches high, terminated by crested spikes of blue, and other coloured flowers, in the different varieties, in June, &c. succeeded by ripe seeds in autumn.

3. **POLYGALA senega.**

Senega Rattle-snake root.] Hath a thick, fleshy perennial root, consisting of many jointed tubercles, striking deep in the ground, from which arise three or four herbaceous stalks, about half a yard high, garnished with broad spear-shaped leaves, placed alternate, and terminal spikes of smaller white flowers in July; but seldom succeeded by ripe seeds in this country.

This last species possesses peculiar medicinal virtues in its roots, particularly as a sovereign and infallible remedy for the bite of the rattle-snake, applied both outwardly and inwardly; and for which, in America, it has been long successfully used by the Senega Indians; also by the inhabitants of Virginia of late years with considerable success in many disorders; is said to be a powerful purifier of the blood, a fine diuretic, &c. and used in hydropic cases, and pleurifies.

All these three species are proper plants to be

be introduced in the pleasure-ground, and most of them will effect an agreeable variety; the first two sorts are hardiest to succeed always in the full ground, but some of the others should have occasional protection in severe winters from frost.

They are all propagated by seed, which in the first and second may be sown either soon after ripe, or in the spring; the plants will come up freely proper for pricking out or transplanting in summer and autumn; the third sort is also raised in the same manner, but require protection from the frosts in winter; and the seed, which is generally procured from America by the seed dealers, should be sown in a light, warm sandy soil; and have protection as above.

Tenderer kinds for the green-house, mostly under-shrubby.

4. *POLYGALA chamæ-buxus.*

(*Chamæ-buxus*)—*Dwarf-box Milk-wort, or Myrtle-leaved Polygala.*] Rises with slender, ligneous, under-shrubby stalks and branches of moderate growth, closely garnished with numerous small oblong, spear-shaped, bright shining-green leaves; and lateral and terminal crested or tufted flowers, white on the outside, and with a mixture of purple and yellow within; very odorous, appearing in May, or June and July.

5. *POLYGALA microphylla.*

Small-leaved, under-shrubby Portugal Milk-wort.] Having slender ligneous stalks branching ten or twelve to fifteen inches high; minute, oval awl-pointed, sessile leaves, and terminal short spikes of large flowers, often of different colours, appearing in May and June; and the seeds ripen in August.

6. *POLYGALA spinosa.*

Thorny African Milk-wort.] With shrubby stem and branches, oval, acute-pointed leaves, and lateral flowers.

7. *POLYGALA chinensis.*

Chinese Decumbent Milk-wort.] With under-shrubby, short decumbent stalk and branches; ovalish leaves, and axillary spikes of flowers.

8. *POLYGALA hysteria.*

(*Hysteria*)—*or, triangular-leaved African Milk-wort.*] With a shrubby tree-like stalk, and triangular, sharp, thorny-pointed leaves.

Of these green-house kinds the first and second are the principal sorts in our English green-house collections, they being curious little shrubby ever-greens, very closely set with their numerous leaves, and they flower very ornamentally in the principal summer months; any of the others are also proper to introduce in the same collection, to increase

the variety: one mode of culture is applicable to the whole, being the same as for other shrubby exotics of the green-house.

They are raised from seed, and occasionally by cuttings: sow the seed in autumn or spring in pots, and protected from inclement weather; or may be sown in March and forwarded in a hot-bed; and by the same assistance may raise some from cuttings and slips, &c. in spring and summer.

POLYGAMIA, the name of the twenty-third class in the Linnæan sexual arrangement of plants, expressive of the polygamy, (many marriages) or inter-communication of different sexes in the plants belonging to that class, by means of their flowers, being both hermaphrodite, and also male or female flowers, or both, on the same or different plants of the same family.

All polygamous plants, which constitute this class, are distinguished by bearing always hermaphrodite flowers, and flowers either male or female, or of both these sexes, either in some all on the same plant, or in others, on two or three distinct plants in the same genus; and from these different circumstances of polygamy, this class is divided into three orders. See **CLASSIS**.

This polygamy of plants occurs variously in different genera in this class.

For instance—in the first order, *Polygamia monœcia*, the polygamy in one habitation, consisting of hermaphrodite and male flowers on the same plant, as in *acer*, *atriplex*, *celtis*, &c. hermaphrodite and females on the same plant, as in *mimosa*: male hermaphrodites and female hermaphrodites on the same plant, as in *musa* only, being such as, although the flower contains the parts proper to each sex, have one of the said sexual parts reciprocally abortive or ineffectual; which, if in the stamina or male, is styled a female hermaphrodite; and if the defect is in the female, is a male hermaphrodite; according as either sex is predominant in all its parts.—In the second order, *Polygamia diœcia*, the polygamy in two habitations or distinct plants, comprehending such as are hermaphrodites and females, on two separate plants of the same species, as in *fraxinus*: hermaphrodites and males on two different plants, as in *diospyros* and *nyssa*, &c. hermaphrodites and males, and females on two distinct plants, as in *gleditsia*; having the hermaphrodites and males on one plant, and the females on a distinct one; and by androgynous and males on two separate plants, as in *panax* and *anthospermum*, &c.—Third order, *Polygamia triœcia*, the polygamia in three habitations

tions or distinct plants, being such as have androgynous, and male and female; in three separate plants of the same species, as in *figus* and *ceratonia*; in which one plant has the female flowers, another the male, and a third is androgynous, i. e. producing both male and female flowers distinct. See *Ficus*, &c.

Polygamy also relates to the inter-communication of the different florets which compose a compound flower, as prevail in most of the orders in the class *Syngenesia*, each main flower consisting of many smaller ones called florets; and are frequently of different sexes, as in *tanacetum*, *aster*, *tagetes*, *chrysanthemum*, *xeranthemum*, *calendula*, &c. which in some are hermaphrodite and females, in others males in the disk and females in the radius, all, in both cases, in the same general flower. See class *Syngenesia*, under the article CLASSIS.

POLYGONUM, Knot-grass.

This genus consists of herbaceous perennials and annuals for adorning the pleasure-garden, and for medical and other uses; rising from about six inches to ten feet high, in different sorts, garnished with oval and spear-shaped leaves, and terminated by branchy spikes of small but numerous apetalous flowers.

Class and order, *Ostendria Trigynia*.

Characters.] CALYX is divided into five oval segments, coloured within, and permanent. COROLLA, none; there being no petals. STAMINA, eight very short filaments, crowned with roundish antheræ. PISTILLUM, a triquetrous germen, three very short styles, and simple stigmas. PERICARPIUM, none; each floret having a single triquetrous seed wrapped in the permanent calyx.

The principal species for our purpose are two perennials, and two annuals.

Perennial Kinds.

These are cultivated in many gardens for variety, but their chief merit is for medical use.

1. POLYGONUM, *Bistorta*.

Bistort or Greater Snake-weed.] Hath a thick oblique intorted root, blackish without, and red within; a simple round slender stem near two feet high, oval leaves, having decurrent foot-stalks, and the stalk terminated by thick short spikes, of whitish-red flowers.

2. POLYGONUM, *viviparum*.

Viviparous Polygonum, or smaller Bistort.] Hath a thickish root, a simple slender stem, half a foot high, spear-shaped leaves, and the stalk and branches terminated by long spikes of whitish-red flowers.

Both these perennials flower in May and June, succeeded by ripe seeds in August.

They grow wild in England, &c. the first in moist places, the other in mountainous situations; are in great estimation for medical purposes; the root being the part used.

Annual Kinds.

The first of these is a noble ornamental plant, commonly called *Perficaria*; the other is an esculent.

3. POLYGONUM *orientale*.

Oriental Polygonum, commonly called Perficaria.] Hath fibry roots; an upright, strong, jointed stem, rising eight or ten feet high, dividing at top into several branches; very large oval-lanceolate alternate leaves, on broad foot-stalks half surrounding the stem; and all the branches terminated by long, slender, hanging spikes of reddish-purple heptandrous and digynous flowers, from July till October.

Variety.] White-flowered oriental *Perficaria*.

They are noble annuals for the decoration of the large compartments of the pleasure-garden.

4. POLYGONUM *Fagopyrum*.

Buck-wheat, or Brank.] Rises with an upright smooth branchy stem, from about a foot and a half to a yard high, heart-shaped-sagittated leaves, and the branches terminated by clusters of whitish flowers, succeeded by large angular seeds; excellent for feeding pigeons, and most sorts of poultry.

All these plants are hardy, and succeed in almost any soil and situation; the two first are perennial in root, and the third and fourth are annual, wholly decay at the end of summer, or early in winter.

As to their merit in gardening, the following are the particulars:

The first two sorts are retained in some curious gardens, for variety; but their chief merit is for medical purposes: they are powerful astringents, and are used both internally and externally; esteemed very efficacious in hæmorrhages, and other fluxes; and good to heal sore mouths.

Third sort *Oriental Polygonum*, or *Perficaria*, is a most elegant annual for the embellishment of the pleasure-ground; it assuming a majestic tree-like growth by its erect luxuriant stem, and branchy head; which being garnished with noble large foliage, and numerous pendulous spikes of flowers, in constant succession three or four months, exhibits a very ornamental appearance from June or July, until October, and is so easy of culture, that from its scattered seeds in autumn young plants rise spontaneously in abundance the ensuing spring, and also from seeds regularly sown

sown in those seasons, or more generally the latter, both in the full ground in patches to remain, and for transplanting, or likewise forwarded by sowing in a hot-bed in March, &c. for transplantation into the borders; and thus raised by either method, the plants shoot up so rapidly, as to attain six or eight feet stature by July or August, when they generally begin flowering, and continue till attacked by the frost, then totally perish; so that a fresh supply must be raised from seed annually.

The fourth sort (*Buck-Wheat*) is a sort of corn, and is frequently cultivated both by way of fodder, cutting its stalks while young and green to feed cattle; and for its grain to feed pigeons, poultry, hogs, &c. it flourishes in any soil and situation, but generally thrives best in light dry earth; and the driest seasons seldom retards its growth.

Method of propagating all the Sorts.

The first and second sort are easily propagated in plenty, by parting the roots in autumn.

The third sort, *Oriental Polygonum*, being annual, is always propagated from seed annually; either in the full ground, or by aid of hot-beds.

By sowing in the full ground.—Some seed may be sown both in autumn, as soon as ripe, and in spring, some scattered thinly about the borders, and the principal part sown regularly in patches; the autumn-sown plants, although they rather rise sparingly, yet those that succeed, generally rise earlier and stronger in the spring following, than the spring-sown plants; it is however proper to sow in both seasons; some of which may be in a warm border for transplanting; and others about the borders in patches, finally to remain, covering the seed half an inch deep; they will come up about April or May, if a fine season; which, when three or four inches high, those designed for transplantation should be planted out singly, about the different compartments; and of those sown in patches, thin out the weakest in moist weather, leaving only one of the strongest plants in each patch; and those thinned out, may also be planted singly where they may be required. According as the plants in general advance some considerable height, place a stout stake to each for support, which is all the culture they require; and they will flower in due season, and furnish plenty of seed.

From the scattered or self-sown seed in autumn, many young plants often rise in spring, and flourish without any trouble.

By hot-beds.—As sometimes in bad seasons, or in cold wet soils, the sowings in the

full ground either rise but sparingly, or not till late in spring, probably May or June; it is therefore proper also to sow some in a hot-bed in March, with other annuals, such as African and French marigolds, China asters, &c. for transplantation, which will forward them considerably; but they must be planted out in May or June before they draw up; or if previously pricked upon another hot-bed, six or eight inches asunder, and arched over with hoops, and sheltered with mats in cold nights; and here to have three or four weeks growth, it would bring them more considerably forward, and they may readily be moved with large balls of earth about their roots, for their final transplantation.

The fourth species, *Buck-Wheat*, is also propagated by seed annually, in any open ground, which sow in April or May, either broad-cast, and raked, or harrowed in, or in shallow drills, ten or twelve inches asunder, the plants will soon come up, and be fit to mow for cattle in eight or ten weeks, or if to stand, will produce a crop of grain in three or four months.

POMUM, Apple, a fleshy fruit, and species of seed-vessel both of many sorts of trees, and some herbaceous plants.

Of this kind of seed-vessel is all the Apple and Pear kind, quince, medlar, pomegranate, gourd, &c. composed of a succulent fleshy pulp, generally of a round, globular, oval, turbinate form, in that of different species of trees and plants, without any valve or external opening, inclosing in the middle a membranous capsule of several cavities or cells for containing the seeds; which in the natural order are confined to their cells till the fruit decays, as this kind of seed vessel has no opening for their dispersion, there being only in some sorts a small close cavity or *umbilicus*, the navel or eye of the fruit at one end, as in apple, pear, quince, &c.

POPULUS, Poplar-tree; comprehending the Abele, and Aspen-tree, &c.

This genus is composed of hardy deciduous trees, valuable for ornamental and forest-tree plantations; they rising to a considerable height and magnitude, garnished with large roundish angulated and heart-shaped simple leaves, and dioecious apetalous flowers, collected into long amentums.

Class and order. *Diæcia Octandria*.

Characters.] CALYX, male and female flowers on two separate trees, collected into oblong, loose, imbricated amentums, composed of oblong scales, each scale forming a cup to a single floret. COROLLA, no petals, but a monophyllous nectarium. STAMINA, eight filaments,

filaments, having large four-cornered antheræ. PISTILLUM, an oval acuminate germen, very short style and quadrid stigma.—PERICARPUM, an oval bilocular capsule, and numerous oval pappous seeds.

There are several species, all of the tree kind, deciduous, and of hardy temperature; will thrive in almost any soil and situation, but are the most prosperous in moist grounds, particularly the first three sorts, which thrive exceedingly in marshy or boggy land, or any similar situation.

The species of most consideration are,

1. *POPULUS alba*.

White Poplar, commonly called Abele-tree.

Rises with an upright straight trunk, and regular branchy head, to a great height, having a whitish smooth bark, roundish leaves, indented into several angles, of a dark-green above, and are downy and white underneath.

Comprises these Varieties.] Large-leaved White Poplar — small-leaved — variegated-leaved.

2. *POPULUS nigra*.

Black Poplar.] Rises with a straight trunk, and full branchy head, to a considerable height; having deltoid-heart-shaped, acuminate, serrated, light-green leaves.

3. *POPULUS tremula*.

Tremulous Poplar, or Aspen-tree.] Rises with an upright large trunk, and a full branchy head, many feet high, having a grey bark, roundish leaves indented into angles, smooth on both sides, with a constant tremulous motion.

The leaves of this species having long slender foot-stalks, are rendered so very tremulous, that they have a constant wavering or trembling motion; hence the name *Populus tremula*.

4. *POPULUS angulata*.

Angulated Carolina Poplar.] Rises with an upright large trunk, and a large regular branchy head, to a great height, having a whitish smooth bark, and the young shoots cornered or angulated; large almost heart-shaped, indented, light shining-green leaves.

This is a very elegant species of *Populus*, of very free growth, and the leaves remarkably large and ornamental.

5. *POPULUS heterophylla*.

Heterophyllous, or variable-leaved Virginia Poplar.] Rises to a great height, having large heart-shaped and roundish leaves, hairy at their first appearance.

6. *POPULUS candicans*.

Tacamahac Poplar, or Balsam-tree.] Is of moderate growth, branching out into a full regular head, having middling-sized leaves,

some ovalish, others somewhat heart and spear-shaped, whitish underneath, and of a very balsamic odoriferous nature. In this species of Poplar, the early buds and young leaves abounding in a very balsamic substance of salutary medical property, is exceedingly efficacious in immediate application to fresh cuts and green wounds.

7. *POPULUS (italica) dilatata*.

Lombardy Poplar.] Rises with a very straight stem, branching erectly, forming a regular pyramidal head, and grows to some considerable height; having large, roundish, acuminate, smooth, light-green leaves: is a remarkable fast shooter.

8. *POPULUS canadensis*.

Canada round-leaved Poplar.] Rises with a straight erect stem, regularly branching to a considerable height, covered with a whitish bark, and garnished with roundish light-green leaves, terminating in an obtuse point, and the border waved.

9. *POPULUS græca*.

Grecian, or Athenian Poplar.] Rises with a straight upright whitish stem, branching swiftly, four or five feet in a year, to a lofty growth; garnished with large heart-shaped leaves, remotely crenated, and glandulous at the base.

In all these trees the leaves are universally of the simple kind, moderately large, and form a distinguishable diversity in plantations in summer; they expand in spring and decay in autumn, like the rest of the deciduous tribe.

All the sorts flower annually in the spring, but the flowers being only small katkins, make no ornamental show; they are all of the class *Diœcia*, i. e. male and female on two separate trees, collected into oblong imbricated amentums or katkins, two or three inches long, the flowers being small florets without petals, situated under the scales of the amentum, appear commonly in March or April; the males come out first, and the females in a week after, and in about five or six weeks are succeeded by ripe seed, which is frequently disseminated by the winds all around to a considerable distance, and often productive of many young plants.

These trees are all of remarkably quick growth, often making shoots whilst young, from three or four to eight or ten feet long in one summer; they are mostly of the large tree kind, and some rise swiftly to a considerable altitude in their general growth; are principally somewhat of the aquatic tribe, delighting to grow in humid soils, in which, at least, they are generally the most prosperous in swiftness and magnitude of growth; they however,

however, succeed almost any where, not reluctant to any soil or situation, moist or dry, low or elevated, as it happens; so may be planted accordingly as required; and in most soils, they will shoot freely and run up very expeditiously; but of which the Lombardy Poplar is superior as the swiftest shooter, and peculiar regularity of growth, in its numerous erect branches generally in a pyramidal form, and in a few years advancing to a considerable height, for which particularities, where a defensive plantation is required in haste, in any particular district, this sort is preferable on that occasion, though I would not advise its use so predominantly as now introduced in many places, in continual outward ranges next road sides, and in front of houses and fore-courts, &c. in which hardly any thing of the tree kind is seen but Lombardy Poplars without variation.

But with respect to the general utility of the different species of Poplar in gardening and planting, they may be employed in assemblage for ornament in out-grounds, not near fine lawns and walks, on account of the great litter the falling of their catkins in some sorts occasion; but are excellent for planting towards the boundaries of parks, paddocks, and fields, the sides of rivers and brooks, and to interperse with other trees in large plantations in any interior parts. The White Poplar or Abele, the Carolina, Tacamahacca, Lombardy and Athenian Poplar, are proper to introduce as ornamental trees, and are finely adapted to be employed in assemblage in forming large avenues, open groves, and clumps in parks, &c. though any of the sorts are eligible on the same occasions to increase the variety; and all the sorts may be employed to advantage in any large tracts of plantation.

If required to ornament any marshy grounds with plantation, no trees are better adapted for that use than Poplars, especially the first three species, all of which thrive remarkably in moist situations, and will readily grow by cuttings, either of young shoots or in truncheons.—See their *Propagation*.

As forest or timber trees, the following sorts, White, Black, Tremulous, and Lombardy Poplar are proper to be employed for that purpose, especially in any moist marshy ground, where few other trees will thrive: they however will succeed in any other common soil poor or rich, but in a very moist ground they will be so expeditious in growth as in six or seven years will afford a considerable advantage, especially if planted close to allow of thinning, for a fall of poles, spars, and for

fire-wood, &c. besides leaving a sufficient number of standards at proper distances to grow up to timber, and the stools of the first fall remaining, shoot up again and afford a fall every four, five, seven, or ten years, as may be required, still leaving the timber standards.

And marshy land may be improved to much advantage by coppices of these trees, to cut every four, five, or six years for poles, and other small purposes; being planted in rows a yard asunder, and in seven years they will be fit to cut for many small uses, and the stools shooting up again strong, will afford a cutting every four or five years after. See *PLANTATIONS*.

Some sorts may also be planted occasionally to form hedges in moist or other situations, more particularly the Lombardy Poplar, as this sort is peculiar in branching out numerously from the bottom upwards, and may be planted hedge fashion along the sides, or top of outward watery ditches, in large plants as at once to form a hedge; they being topped to five, six, or seven feet, and they will thus shoot out laterally more effectually close.

For all the above purposes young trees are propagated and raised, as directed below in their propagation.

Method of Propagation:

All the sorts of *Populus* are easily propagated by cuttings, layers, and suckers.

By Cuttings.—October and November is a good season for this work, or even any time in winter until March, in open weather. This is the most expeditious mode of propagating all these trees, for cuttings thereof grow freely without any trouble; either cuttings of the young year-old shoots, a foot and half long, planted a foot deep, or large truncheons of two, three, or more years growth, from about a yard to five or six feet long, planted in moist places: though these large cuttings or truncheons are not proper for any general plantation, only just in some particular parts, in a marshy or watery situation, where shade and shelter, &c. may be required as soon as possible, in which may be planted a quantity finally to remain; planting them about one to two feet deep.

But, in order to raise plants for any regular plantation, or for a quantity of handsome standards, it is the most eligible to raise them principally from young cuttings of one year's growth, or two at most; procure therefore a quantity of these young cuttings, about fifteen or eighteen inches long, and plant them in nursery-rows two feet asunder, placing each cutting two parts or half-way in the ground, and about

about a foot distance in the lines, they will readily take root, and make good shoots the following summer, being careful to trim off straggling laterals in order to encourage the leading shoot to grow straight, and aspire more expeditiously in height; and after having from two to four or five years growth here, they may be transplanted finally for the purposes above-mentioned.

By Layers.—In autumn choose any lower young shoots conveniently situated, lay them by slit-laying, they will be well rooted and fit to transplant by autumn following, in nursery-rows, to have two or three years growth.

By Suckers.—Some of the sorts send up abundance of suckers from the roots, which may be taken up after the fall of the leaf, and planted in nursery-rows, as directed for the cuttings; they will form good plants in two years.

The plants raised by all the above methods, will, after having obtained from two or three to five or six years growth, be of proper size for furnishing any of the aforementioned plantations.

These trees may also be raised from seed, if care is taken to gather a quantity as soon as ripe; and sow it in autumn in beds either broad-cast or in drills, half an inch deep.

PORTLANDIA, comprises large trailing and other exotic, ever-green plants for the stove.

Class and order, *Pentandria Monogynia*.

Characters.] CALYX, a five-leaved cup, above the germen. COROLLA, monopetalous, long, funnel-shaped tube, and border cut in five acute segments. STAMINA, five awl-shaped declining filaments, from the bottom of the tube, and near the length of the corolla, topped with linear erect antheræ. PISTILLUM, a roundish pentagonal germen below the flower, a single style, and oblong blunt stigma. PERICARPIUM, a five-cornered retuse two-celled capsule, crowned with the cup and containing many roundish compressed seeds.

1. PORTLANDIA *grandiflora*.

Great-flowered Portlandia.] Hath long rooting stalks, running many feet high, garnished with oval, pointed leaves, on short foot stalks, five or six inches long, and three or four broad, and placed opposite the flowers: come out singly from the axilla of the leaves: towards the extremity of the branches they are white; eight or ten inches long, and make a noble appearance.

This elegant plant is a great ornament to the stove, and is commonly trained along the back part, and exhibits its large flowers in July and August. Its propagation is by cut-

tings in the spring, which must be planted singly in pots and plunged in the bark-bed, and afterward shifted into larger pots and replunged in the bark, where they must constantly be retained: it is also sometimes propagated by seeds obtained from abroad.

The two following species are also retained in some stove collections.

2. PORTLANDIA *hexandria*.

Hexandrous or six-male Portlandia.] With ovate leaves, equal at the base; and flowers having six stamina.

3. PORTLANDIA *tetrandria*.

Tetrandrous, or Four-male Portlandia.] With oblong obtuse leaves, broad stipulæ, and flowers having four stamina.

The propagation and culture of these two species is the same as the first sort.

PORTULACA, Purslane.

Two species are found in our gardens; one a low herbaceous succulent annual, a salad herb; the other a low shrubby perennial for the green-house, or stove collection; both rising only six or eight inches high, garnished with small succulent leaves, and small pentapetalous flowers.

Class and order, *Dodecandria Monogynia*.

Characters.] CALYX is small, bitid, and placed on the germen, and permanent. COROLLA, five plane, obtuse, erect petals. STAMINA, from twelve to nineteen short capillary filaments having simple antheræ. PISTILLUM, a roundish germen, short simple style, and five oblong stigmas. PERICARPIUM, an oval covered capsule, of one cell, having many small seeds.

There are several species but the two following are the most noted.

1. PORTULACA *oleracea* (Annual.)

Common culinary Purslane.] Rises with herbaceous, low, succulent, branchy stalks, six or eight inches high, garnished with wedge-shaped, thick, succulent leaves, and small close-setting flowers.

Comprises two Varieties.] Green Purslane, having deep-green leaves.—Golden Purslane, having yellowish leaves; both the varieties rising from the same seed.

These herbs are excellent to mix in summer salads.

2. PORTULACA, *Anacampseros* (Perennial.)

(Anacampseros) — or Shrubby ever-green African Purslane.] Rises with a shrubby branchy stalk, about six inches high, oval, gibbous, succulent leaves, and the stalks terminated by small clusters of red flowers.

Both these plants are of a succulent nature; the first is an herbaceous annual, for culinary uses; and the second a shrubby perennial, cultivated

about a foot distance in the lines, they will readily take root, and make good shoots the following summer, being careful to trim off straggling laterals in order to encourage the leading shoot to grow straight, and aspire more expeditiously in height; and after having from two to four or five years growth here, they may be transplanted finally for the purposes above-mentioned.

By Layers.—In autumn choose any lower young shoots conveniently situated, lay them by slit-laying, they will be well rooted and fit to transplant by autumn following, in nursery-rows, to have two or three years growth.

By Suckers.—Some of the sorts send up abundance of suckers from the roots, which may be taken up after the fall of the leaf, and planted in nursery-rows, as directed for the cuttings; they will form good plants in two years.

The plants raised by all the above methods, will, after having obtained from two or three to five or six years growth, be of proper size for furnishing any of the aforementioned plantations.

These trees may also be raised from seed, if care is taken to gather a quantity as soon as ripe; and sow it in autumn in beds either broad-cast or in drills, half an inch deep.

PORTLANDIA, comprises large trailing and other exotic, ever-green plants for the stove.

Class and order, *Pentandria Monogynia*.

Characters.] CALYX, a five-leaved cup, above the germen. COROLLA, monopetalous, long, funnel-shaped tube, and border cut in five acute segments. STAMINA, five awl-shaped declining filaments, from the bottom of the tube, and near the length of the corolla, topped with linear erect antheræ. PISTILLUM, a roundish pentagonal germen below the flower, a single style, and oblong blunt stigma. PERICARPIUM, a five-cornered retuse two-celled capsule, crowned with the cup and containing many roundish compressed seeds.

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tings in the spring, which must be planted singly in pots and plunged in the bark-bed, and afterward shifted into larger pots and replunged in the bark, where they must constantly be retained: it is also sometimes propagated by seeds obtained from abroad.

The two following species are also retained in some stove collections.

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Hexandrous or six-male Portlandia.] With ovate leaves, equal at the base; and flowers having six stamina.

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Tetrandrous, or Four-male Portlandia.] With oblong obtuse leaves, broad stipulæ, and flowers having four stamina.

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Class and order, *Dodecandria Monogynia*.

Characters.] CALYX is small, bifid, and placed on the germen, and permanent. COROLLA, five plane, obtuse, erect petals. STAMINA, from twelve to nineteen short capillary filaments having simple antheræ. PISTILLUM, a roundish germen, short simple style, and five oblong stigmas. PERICARPIUM, an oval covered capsule, of one cell, having many small seeds.

There are several species but the two following are the most noted.

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Comprises two Varieties.] Green Purslane, having deep-green leaves.—Golden Purslane, having yellowish leaves; both the varieties rising from the same seed.

These herbs are excellent to mix in summer fallads.

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Both these plants are of a succulent nature; the first is an herbaceous annual, for culinary uses; and the second a shrubby perennial, cultivated

tivated by the curious for variety; are both exotics of a tender quality, of the temperature of green-house and stove plants.

The common *Culinary Purslane* is raised annually from seed for summer use, both as a salad and pot-herb, is of a moist cold-nature, and an excellent ingredient to mix in summer salads, but not so proper for winter use; the plant being tender must be raised either in a hot-bed, or in a warm border, in which latter it will not succeed before April or May.

The shrubby sort must be kept in pots of dry soil, and placed in the hot-house collection.

Method of Propagation.

The propagation of the *Common Purslane* is by seed annually in spring and summer; for, in order to continue a succession of young plants for use, it is proper to sow several different times from March or April until June, July, or August, at about three or four weeks interval; observing, if required to have it early, the first sowing may be performed in a slender hot-bed in February or March, and the other sowings may be in a warm border of lightish earth in April and May; though, as the warm season advances, the sowings may be in any open bed or border of light ground. The seed may either be sown in shallow drills, and covered about a quarter to half an inch deep, or all over the surface, covering it that depth, or may be raked in lightly: give occasional light waterings in dry weather, both before and after the plants come up, which are to remain where sown, and they will be fit to cut for use in three or four weeks. In gathering them for use, cut off their young tops with a knife: they will shoot out again after each cutting.

To save seed of this sort, leave some strong plants of the April sowing: they will flower and ripen seeds freely towards autumn.

The second sort is propagated by cuttings, any time from April till June or July; plant them in pots of light dry earth, and if plunged in the bark-bed they will root the sooner, giving occasional shade till rooted, and moderate watering.

PORTULACARIA, *Purslane-tree*.

This genus furnishes a shrubby succulent plant for the green-house.

Class and order, *Pentandria Trigynia*.

Characters.] CALYX, a diphyllous, coloured, permanent cup, with a very spreading, obtuse, concave border. COROLLA, five oval, blunt, entire petals. STAMINA, five awl-shaped, erect, very short filaments, topped with ovate antheræ. PISTILLUM, a three-cornered germen, above the flower: no style; but the

germen crowned with three spreading stigmata. PERICARPIUM, none; but the cup and corolla contain an oval-oblong, three-sided, winged seed.

We know but of one species, which was formerly arranged with the *Crassulas*, viz.

PORTULACARIA *afra*.

African Purslane-tree.] Hath a very thick, succulent, perennial stalk of a reddish colour, branching pyramidally three or four feet high, garnished with ob-oval, wedge-shaped, succulent, opposite leaves, and flowers growing in spikes, but rarely appear in England.

This plant is easily propagated by cuttings of their stalks and branches, cut from three to four or five inches long, in May or June: after lying in a dry place some days to heal over the wounded part, plant them in pots of sandy earth, placing them in a frame to be occasionally shaded in hot weather, and protected from wet; and in a few weeks they will be rooted: or they may be planted in a bark-bed, which will facilitate their growth. It must in winter be kept in the green-house, observing to be sparing in watering these plants at that time of the year.

POTENTILLA, *Cinquefoil*.

The genus consists of one noted shrubby species, and near thirty herbaceous kinds; the former is a hardy deciduous flowering shrub for the pleasure-ground; and the others having but little merit as garden plants, only a few of them are sometimes admitted in the herbaceous collection for variety. All the sorts are of moderate growth, some growing erect, others trailing, and garnished with pinnated and other compound leaves, and pentapetalous flowers.

Class and order, *Icosandria Polygynia*.

Characters.] CALYX is monophyllous, half cut into ten parts, alternately smaller, and reflexed. COROLLA, five roundish, spreading petals, inserted into the calyx. STAMINA, twenty or more awl-shaped short filaments, having elongated-lunulated antheræ. PISTILLUM, numerous small germina collected into a head, many slender styles, having obtuse stigmas. PERICARPIUM, none; a head of seeds placed on the common receptacle, which lodges in the calyx.

There are about six or seven species found in our gardens, one of which is shrubby, the others herbaceous.

Shrubby kind.

1. POTENTILLA *fruticosa*.

Shrubby Potentilla, commonly called Shrub Cinquefoil.] Rises with a short shrubby stem, dividing into a branchy full head, three or four feet high, closely garnished with pinnated leaves,

leaves, of five oblong, narrow, acute-pointed folioles, pale-green above, and whitish underneath; and the branches terminated by clusters of large, spreading, yellow flowers.

This is a beautiful deciduous flowering shrub, worthy a place in every curious collection.—It grows wild in Yorkshire and other northern parts of England, &c. but has been long a resident of gardens as an ornamental shrub.

Herbaceous perennial kinds.

There are about six or seven of these kinds common to our gardens; the first of which grows wild in England, and is rarely cultivated; the others are of foreign growth in different parts of Europe.

2. *POTENTILLA reptans.*

Creeping Common five-leaved Potentilla, or five-leaved grass.] Hath a thick fibry root, slender, trailing, repent stalks, digitated, five-lobed, petiolated leaves, and yellow flowers, singly.

3. *POTENTILLA rupestris.*

Mountain upright Cinquefoil.] Hath upright stalks, eight or nine inches high; pinnated, five and three-lobed, alternate leaves, having oval crenated lobes, and the stalks terminated by small white flowers.

4. *POTENTILLA erecta.*

Erect, seven-lobed, Yellow Cinquefoil.] Hath erect stalks; seven-lobed leaves, having the lobes spear-shaped and serrated, green and hairy on both sides; and the stalks terminated by corymbose clusters of yellow flowers.

5. *POTENTILLA Fragaroides.*

Strawberry-like trailing Potentilla.] Hath a somewhat tuberous root, furnished with many long fibres, long trailing shoots, rooting at the joints; pinnated, mostly three-lobed leaves, having oval lobes, with the extreme lobe the largest, and clusters of small white flowers.

This species bears a great resemblance to the small sterile strawberry plants.

6. *POTENTILLA argentea.*

Silvery upright Potentilla.] Hath upright stalks, branching a foot high; and five-lobed leaves, having the lobes wedge-shaped, cut on the edges, hoary and white underneath, and the branches terminated by small yellow flowers.

7. *POTENTILLA grandiflora.*

Grandiflorous, or Great-flowered Potentilla.] Rises with upright stalks, eight or ten inches high; dentated, ternate leaves, downy underneath, and the stalks terminated by large yellow flowers.

All these *Potentillas* flower in June and July; the flowers are composed each of five roundish petals, and about twenty stamina.

They are very hardy plants, and may be employed in the different compartments of the pleasure-ground. The first species in particular, *Shrubby Potentilla*, merits a place in every shrubbery towards the front of the clumps, &c. and the herbaceous kinds may be dispersed about the common compartments to increase the variety.

Their propagation is very easy.

The *Shrubby Potentilla* may be propagated abundantly by suckers, layers, and cuttings; all of which will readily grow, and make plants in one year, which, after having two or three years' growth in the nursery, will be fit for any of the shrubbery compartments.

All the herbaceous kinds may be propagated by parting the roots in autumn or spring, or by seed in any of those seasons.

POTERIUM, Garden Burnet.

It consists of two herbaceous and one shrubby perennial: of the former, one is a kitchen-garden herb, the other for the pleasure-garden, and the shrubby kind for the green-house collection; they all rising with upright stalks from about a foot and a half to a yard high, in different sorts; having pinnated leaves, and the branches terminated by spikes of quadripartite monœcious flowers.

Class and order, *Monœcia Polyandria.*

Characters.] *CALYX*, male and female flowers on the same spike, each floret having cups formed of three oval leaves. *COROLLA*, in the males it is quadripartite, the segments oval, concave, and permanent, and in the females is monopetalous and wheel-shaped, with a short tube, divided above into four oval, plane, persistent segments. *STAMINA*, numerous capillary filaments, and didymous antheræ. *PISTILLUM*, two oval-oblong germens, two hair-like, coloured styles, and pencil-shaped, coloured stigmas. *PERICARPIUM*, a berry inclosed in the indurated corolla, having two seeds.

Herbaceous kinds.

The first of these herbaceous kinds is an esculent herb, the other for variety in the pleasure garden.

1. *POTERIUM Sanguisorba* (Perennial).

Common garden Burnet.] Hath fibry perennial roots, crowned by a large tuft of pinnated leaves, of six or seven pair of sawed lobes, terminated by an odd one; upright angular stalks, dividing, and branching a foot and a half high, terminated by oblong spikes of purplish-red flowers.

This species grows wild in England, in chalky soils, but has been long cultivated as a choice salad-herb, &c. for winter and spring use,

use, it being of a warm nature; the young leaves are the useful parts.

It is perennial in root, and retains its radical leaves all the year, but the stalks are annual.

2. POTERIUM *hybridum*.

Hybrid Agrimony-leaved Montpellier Burnet.] Rises with upright, taper, closely gathered stalks two feet high, pinnated odoriferous leaves, of three or four pair of sawed lobes, terminated by an odd one; and the stalks terminated by long foot-stalks dividing into smaller, each supporting a small roundish spike of flowers.

This species often proves biennial, but by cutting down some of the stalks before they flower, it will cause it to multiply at bottom, and become abiding.

Shrubby kinds for the Green-house.

3. POTERIUM *spinosum*.

Shrubby Spinous Burnet of Crete.] Hath a shrubby stem and branches, rising a yard high, armed with spines; small, pinnated, evergreen leaves, of six or seven pair of lobes, terminated by an odd one, and the branches terminated by small heads of greenish flowers.

All these three species flower in June and July, succeeded by ripe seeds in autumn.

They are all naturally perennial, but the two herbaceous kinds being abiding in root only; the other in root, stem, and branches; and the two former are hardy, and the third requires shelter in winter.

The first sort merits culture in every kitchen-garden for winter and spring fallads.

Some plants, both of the first and second sorts, may be introduced in the herbaceous collection in the pleasure-garden for variety.

Keep the third sort always in pots to have shelter in winter.

They are all easily propagated as follows.

The first sort by seed, and by parting the roots.—Sow the seed in autumn or spring, in a border of light earth, and rake it in; and when the plants are two or three inches high, plant them out in any bed or border, a foot asunder, finally to remain.—Parting or slipping the roots is performed also in the autumn or spring season, planting the slips as directed for the seedlings.

The second sort may also be increased by seed and slips of the root, as for the former sort.

And the propagation of the third is by slips or cuttings of the branches in spring and summer, planted in pots, and placed under glasses, giving shade and water; or might be forwarded more by plunging them in a hot-bed.

POT-HERBS, consisting of different

sorts of small aromatic herbs, and some other kinds, used in composition, and separately, in several culinary occasions.

In a general sense, Pot-herbs may be said to comprehend many of the kitchen garden plants, but are principally understood to comprise chiefly such as are in request to improve soups, broths, and some other similar culinary preparations, in which, sometimes, several different sorts of small herbs are used less or more, of particular kinds in composition, and some singly, on the same and other occasions.

They consist of the following sorts; thyme, majoram—savory—sage—parsley—mint—pennyroyal—sorrel—chervil—basil—coriander—dill—fennel—marigold—borage—burnet—tansey—tarragon—chives—leeks—onions—green-beet—white-beet—spinach—celery—endive—lettuce—love-apple—capsicum—purslane.

These being the principal sorts that come under the denomination of Pot-herbs, they are all used as such, some or other of them, less or more, compound or separately, for particular different culinary purposes as above; and some of them are most commonly used separately, as principal culinary and salad-herbs, such as spinach, green and white, to boi, as separate dishes; celery, endive and lettuce, as choice salad herbs, and sometimes to stew.

But we may just remark, that, of the above list of Pot-herbs, the most generally useful sorts in common request are the thyme, majoram, savory, parsley, sage, mint, marigold, penny-royal, leeks, celery, onion.

However, in considerable gardens, and those of large families of fashion, all the above sorts are often required on different occasions, and in which it is necessary to have a proper supply accordingly: a large portion of the principal sorts the most generally used, especially of the different sweet aromatic kinds in request for soups, broths, &c. as specified in the second list above; some of which, as leeks, celery, and onion, are always raised in considerable crops; the others in small or moderate quantity; and of those in demand only on some particular occasions, may be in still smaller supplies.

For particulars of some further descriptions of the respective uses, mode of growth, and general culture, see AROMATICS and KITCHEN GARDEN PLANTS; in which the different sorts appear under their botanic and English names, referring to their respective genera accordingly for the general description of each sort separately.

POTS. Garden Pots for plants and flowers.

In gardening, Pots are particularly necessary in the culture of numerous sorts of plants, such as in all tender exotics of the green-house and stove, all of which must be planted in Pots for the convenience of moving them in and out of these departments as occasion requires.

Pots are also exceedingly useful in raising many young seedlings and cuttings, that may require moving to occasional shade, shelter, and artificial heat; likewise for many young plants that are tender whilst young, requiring to be removed under shelter for the first two or three winters, but become hardy enough afterwards to bear the full air the year round; and Pots are likewise very convenient in which to plant many of the more curious hardy flowering plants and others, and choice flowering shrubs, &c. to remove occasionally to adorn any particular compartments.

There are about eight different sizes of Garden Pots, which are necessary in order to suit the different sorts of plants, as well as all sorts of plants in their different stages of growth; as when the plants are young and of small size, they may be first planted in small Pots; and as they by degrees increase in bulk, shift them into pots a size larger, repeating it as often as necessary. See *PLANTING in Pots and Shifting Plants*.

The several sizes of Pots are in regular gradation, and at the Pot-Houses each size has its name for the convenience of readily supplying the sizes wanted for particular uses; they being always reckoned by the cast, from two to sixty Pots to each, according to their sizes, the largest Pots being only two to a cast, and the smallest sixty; so that as being of eight different sizes or casts, they are distinguished by the following terms, twos, eights, twelves, sixteens, twenty-fours, thirty-twos, forty-eights, and sixties; so according to the above numbers there are so many Pots to each cast; the several casts from the twos, being in a gradual diminution in size, and the price of the different casts is the same; those of two, &c. being as much as those of sixty, and so of the rest; from two to three shillings is the general price per cast at the potters' in the neighbourhood of London.

In the order of garden Pots, there is a particular shallow sort of a wide, squat, pan-form make, used in some occasions, especially among the myrtle-gardeners in the neighbourhood of London, who, in raising great quantities of the plants of that species annually, in order to have always a regular succession advanced to proper growth, for the markets of

that metropolis, generally use these kinds of wide shallow pan Pots, wherein to prick or plant the requisite supply of numerous small myrtle cuttings, in summer, &c. for the annual propagation; and on which occasion, they are commonly called store-pans.

And, as in these store pans they generally prick a great number of the above small slips or cuttings, at only about an inch or two apart, to the amount of hundreds in each such pan, just to strike them, and to remain two or three months or more, till advancing a little in growth; in which interval the said pans thus stored, are convenient for removing to different situations required, such as, at first planting or afterwards, either into a hot-bed, whereby to strike the cuttings more expeditiously, or for the same advantage, in default of hot-beds, to place under a garden frame and lights, or each pan placed under a hand-glass, either with or without a hot-bed; and also for removing them to a green-house or garden frame, for protection in winter, &c. all of which, being thus continued in the store pans, two, three, or four, to five or six months, or more, according to the progress of growth they make, so as when they discover to be well struck in bottom radicles and shoot a little top, in one summer's growth, are then pricked separately in small Pots, or occasionally three, four, or five in larger, for a year, then separated as above, or sometimes in May, are bedded out in beds of natural earth, six or eight inches apart, to acquire an advanced state till September, and then potted singly, as just above observed.

The same kind of pan Pots are also useful occasionally, for several other purposes of propagation, both in which to sow seed and plant small cuttings, slips, &c. of tender exotics, and of various other sorts of curious or particular kinds of plants, both of the green-house, hot-house, and the open-ground, in order to have similar culture as above.

These kinds of pan Pots are ten or twelve, to fourteen inches wide, and about six inches deep, having holes at bottom as in the common garden Pots.

Another sort of Pots, of different make from the general kinds, are sometimes used, in which to plant some kinds of bulbous roots, for blowing in the apartments of a house; they are narrow and upright, of equal width from bottom to top, six, eight, or ten inches deep, or little more, and three, to four or five inches width; and are occasionally used for planting bulbs of the Guernsey lily and some other similar kinds, to blow in autumn and winter, in the windows or chimney-

piece of a dwelling or sitting room, or in a green-house, or hot-house, &c. as may be required; or especially the former, as they appear neat, and admit of placing close, or in a smaller space than the common Pots; and generally but one bulb planted in each: they being previously filled with light sandy earth, near to the top, then planting the bulb therein, cover it in evenly with earth, just only a small depth over the crown; and in which they strike their fibres down into the earth, and flower very agreeably in good perfection.

The several sorts of Pots are obtained at the potters in the different parts of the kingdom; great quantities are made in many of the villages in the vicinity of London, both for neighbouring supply, and to send to a distance by land and water carriage.

In choosing the Pots, see that they are burnt sufficiently hard, and so perfectly sound as to ring when struck with your knuckles, and that they have all holes at the bottom to discharge the superfluous moisture from the earth about the roots of the plants; the larger Pots having generally four holes, one in the middle of the bottom, and three around the circumference thereof, at equal distances; but the smaller Pots have commonly only one hole in the middle of the bottom.

With respect to the proper sizes of Pots requisite for the different sorts of plants, it is commonly mentioned in their respective genera, when any particular sizes are necessary.

When we occasionally speak of small Pots, it is generally to be understood either as sixties, forty-eights, or thirty-twos, according to the sorts or sizes of the plants.

For the method of planting in Pots, &c. shifting plants from one Pot to another, &c. see *Planting in Pots*, under the article PLANTING.

PRASIUM. Shrubby hedge-nettle.

For the green-house, this genus furnishes two species of Italian exotics, low shrubby ever-greens, of two or three feet growth, with whitish stalks, dividing into many slender branches, garnished with oblong and oval leaves; and white flowers of the lip kind, disposed in whorles; having bell-shaped bilabiated cups, monopetalous, ringent, two-lipped corolla; two long and two shorter stamina, four-parted germen, single style, and four naked seeds.

Class and order, *Didynamia Gymnospermia*.

The species are,

1. *PRASIUM majus*.

Major Shrubby Hedge Nettle.] With oval-oblong serrated leaves.

2. *PRASIUM minus*.

Minor Shrubby Hedge Nettle.] With egg-oval, doubly crenated leaves.

These two shrubby ever-greens are natives of Sicily, &c. and in this country require the culture of green-house plants; in which collection they effect an agreeable variety, as evergreens, in foliage all the year; flower in summer, and ripen seeds in autumn; by which they may be raised in a hot-bed in spring, or in a bed of natural earth in April; also by slips and cuttings in the same season.

PRIMULA. Primrose. Including *Polyanthus* and *Auricula*.

This famous genus *Primula* furnishes a grand collection of low, herbaceous, fibrous-rooted, flowery perennials; two celebrated species in particular, *common Primrose* and *Auricula*, have singular merit, as very beautiful spring flowers, and for each species furnishing thousands of varieties, are all of humble growth, with the roots crowned by a cluster of oblong broad leaves, and low slender flower-stalks, from about three or four to six or eight inches high, terminated by monopetalous, five-parted flowers, some singly, others in clusters.

Class and order, *Pentandria Monogynia*.

Characters.] **CALYX**, a many-leaved involucre, containing many small flowers, each having a monophyllous, tubulous, pentagonous cup, divided into five acute erect segments, and is permanent. **COROLLA** is monopetalous, with a long cylindric tube the length of the calyx, having the limb or upper part spreading, and divided into five roundish heart-shaped segments. **STAMINA**, five very short filaments, situated in the neck of the corolla, having acute erect antheræ. **PISTILLUM**, a round germen, slender style, and globular stigma. **PERICARPIUM**, an oblong, cylindric, unilocular capsule, ten-parted at top, containing numerous small seeds.

There are six or seven species in this genus, two of which demand universal esteem as flowery plants; namely, *Common Spring Primrose*, and *Auricula*; the former of which includes all the family of the Primroses, Cowslips, and all the numerous varieties of *Polyanthuses*; and the latter, all the vast train of the *Auricula* tribe. The *Auricula*, however, was formerly ranged as a distinct genus; but its general characters determining it a species of *Primula*, modern botanists arrange it accordingly; which, and the Primrose, and *Polyanthus*, are the principal species and varieties of this genus, that are the most generally estimable to cultivate as ornamental flowering plants; and of which shall first proceed to describe

scribe the Primrose family, which is very numerous in different varieties, consisting of the Common Primrose—Cowslip-Primrose,—Polyanthos-Primrose, or Polyanthus; arranging each under a distinct head.

Common Primrose kinds.

PRIMULA veris.

Common Spring Primrose.] Hath thick very fibry roots, crowned by clusters of large, oblong, indented, rough leaves, and numerous flower-stalks, from about three or four to five or six inches high, each terminated commonly by only one flower, of different colours and properties in the varieties.

Varieties of these are,] Common yellow-flowered Primrose of the woods—White Primrose—Paper-white Primrose—Red Primrose—Double yellow Primrose—Double white Primrose—Double red Primrose—Double-pink Primrose—Double crimson Primrose; all of which varieties having generally but one flower on each stem, but rise in such plenty from every part as to appear almost covered with flowers.

They all flower abundantly in March and beginning of April, continuing a month or six weeks.

All these varieties of *Common Spring Primrose* are hardy perennials: the single yellow sort grows wild in woods, &c. in most parts of England; all the others being seminal or seedling varieties of it, that have been principally obtained by culture in gardens. The double kinds in particular have singular beauty; the flowers being large, and perfectly full and double, and make a fine show, highly meriting culture in the best collections of spring-flowers.

These varieties in general delight mostly in shady situations, whereby all the sorts, both single and double, are proper ornaments for the borders of shrubberies, wilderness quarters, and shady walks, where they will flower abundantly, and make a fine appearance. Some plants may also be dispersed in other more open compartments for variety.

The propagation of all these varieties is effected abundantly by slipping or parting the roots. Numerous single kinds may also be raised from seed, sown in a shady border in autumn or spring, as directed for the Polyanthus; but raising seedlings is hardly worth practising, since they increase so plentifully by the roots.

Remarking, however, that the propagation by slipping or dividing the roots is the only method for increasing the double kinds; and as these sorts are the most beautiful, and multiply in tolerable plenty by off-sets, it is pro-

per to raise a good stock of them; which may be effected with great facility every year soon after their flowering is past, as they will then be increased into large bunches; therefore being furnished with some good roots, proceed to their propagation in autumn, about July, August, or September; taking them up out of the ground, and divide each bunch of plants into several slips, and directly plant them in a shady border of good rich earth, six or eight inches asunder, and each slip will become a good plant, and will flower strong the following spring.

Observe, it is proper to remove and part the roots of the double kinds, in particular, every year; but not to omit once in two years at most, in order to preserve the plants in vigour.

Cowslip kinds.

PRIMULA veris officinalis.

Officinal Primrose, or common Cowslip.] Hath very thick fibry roots, crowned by a cluster of oblong, indented, round leaves, and upright firm flower-stalks, five or six inches high, terminated each by a cluster of small yellow flowers, and other different colours and properties in the varieties.

Varieties of these are,] Common single yellow Cowslip of the meadows and pastures—Double yellow Cowslip—Scarlet Cowslip—Hose-and-hose Cowslip, one flower growing out of the bosom of another, the lowermost serving as the calyx; all of which varieties having the flower stalks crowned by many flowers, in bunches.

They flower in April and May, continuing in succession a month or six weeks.

All the varieties are hardy perennials, some of them inhabitants of the meadows and pasture grounds, particularly the common single yellow sort, in great abundance; which sort is of excellent use in medicine, and a fine cordial wine is made of the flowers. Some plants of all the varieties merit admittance in the pleasure garden, to increase the variety of the spring bloom, but principally the double kinds, placing them in the fronts of some shady and other borders, &c. they do not, however, succeed so well immediately under shade of trees, as the common Primroses.

The propagation of these sorts is principally by parting the roots, as directed above for the common Primrose; this method of propagation is, however, particularly necessary for all the double kinds; and having a few roots of each sort, they will multiply exceedingly by off-sets, and soon increase your stock.

Polyanthus

*Polyanthus Kinds.**PRIMULA veris elatior.*

Polyanthos Primrose, commonly called Polyanthus.] Hath thick fibrated roots, increasing into large bunches; crowned with a cluster of large, oblong, indented, rough leaves; amidst them upright flower-stalks six or eight inches high, terminated mostly by a cluster of several spreading flowers, of many different colours and variegations in the varieties.

Varieties.] The varieties of *Polyanthus* are innumerable in the different colours and variegations of the flowers; but the principal colours are—Purple-flowered—Red-flowered—Gold-coloured—Orange-coloured, &c. each having numerous intermediate shades and variegations, that sometimes in one bed or border of the seedlings we may discover many hundred different sorts, and the varieties may still be increased without end from seed; and the select varieties of each sowing may all be continued and increased plentifully by slipping the roots, which annually multiply into large bunches, and may be parted or slipped with the utmost facility into many separate plants.

They all flower beautifully in April and May, and often flower again in autumn, and sometimes in winter, in very mild seasons; but the spring is their principal season of flowering in the greatest perfection, and ripen seeds abundantly in June or July.

This variety, *Polyanthus Primrose*, is one of the most beautiful of our fibrous-rooted spring flowers for the open borders, remarkable for its wonderful seminal diversity, all of which are hardy perennials, that flourish in almost any common soil and situation, but delight most in a loamy or other rich moist soil, and in a somewhat shady border; in a shady situation, however, they continue considerably longer in full bloom than in a sunny exposure; for a fierce sun often greatly affects these flowers both in beauty and duration; it is therefore proper to plant a collection of the finest sorts in the shade, not immediately under trees, &c. but in some eastward shady border, sheltered by a wall, hedge, or other fence from the noon-day sun, planting them at six or eight inches distance; and here the plants will continue flowering in full beauty a month or six weeks: but a quantity of different varieties should also be dispersed in the fronts of the several borders contiguous to the principal walks, in assemblage with other flowers, in which they will effect a very agreeable variety.

The *Polyanthus* is one of the noted prize-flowers among florists; many of whom are

remarkably industrious in raising a considerable variety of different sorts, as well as use every art to blow them with every requisite perfection; for among those virtuosi, a *Polyanthus* must possess several particular properties to have admittance in their choice collections.

But there are numerous varieties of *Polyanthus*, that, although destitute of some of the properties required by florists, are nevertheless very pretty flowers for ornamenting the common borders.

The chief properties, however, of a florist's *Polyanthus* are principally the following:—

1. The stem or flower-stalk shall be upright, moderately tall, with strength in proportion, and crowned by a good regular bunch of flowers, on short pedicles, strong enough to support them nearly in an upright position.
2. The florets of each bunch should be equally large, spread open flat, with the colours exquisite, and the stripes and variegations lively and regular.
3. The eye in the centre of each floret should be large, regular, and bright, and the antheræ, by the florists called the thrum, should rise high enough to cover the mouth of the tube or hollow part in the middle of the florets, and render them what they call thrum-eyed; but when the style elevates the stigma above the antheræ, the eye of the tube generally appears hollow, showing the stigma in the middle, like the head of a pin, is hence called pin-eyed, and is, by some, rejected as an incomplete flower, although its other properties be ever so perfect.

But although the florists reject a pin-eyed *Polyanthus*, it is the flower in its most perfect state; and great numbers of them are of as beautiful forms, colours, and stripes, as the thrum-eyed varieties, and demand equal attention as furniture for decorating the common flower compartments, &c. or to exhibit a general show in a bed or border.

The method of propagation for the *Polyanthus* is by seed, and by parting the roots.

By Seed.—This is the only method of propagation to gain new varieties, and to raise a large stock of plants, as a blow of many new flowers may be annually obtained for the choice collection, and a large supply for the common borders: the season for sowing the seed is either in autumn, soon after it is ripe, or early in spring; in either season of sowing they will soon come up, but will not flower till the second spring; observing, however, that by sowing early in autumn, the plants generally come up freely the same year, are fit to plant out betimes the next spring, and become stronger plants by the spring following, capable

capable of flowering in greater perfection than the spring-sown seedlings: remarking, if you sow in autumn, let it be in July or beginning of August; and if in the spring, perform it in February, March, or beginning of April: and the sowing in both seasons may be performed either in large pots or boxes of rich earth, in order to move to different situations occasionally, or in an east border of light rich soil; but sowing in pots or boxes may be the most eligible for the autumn sowing, for the convenience of moving to a little shelter in frosty weather; in either method sow the seed on the surface moderately thick, covering it evenly with light earth, only about a quarter of an inch thick; or if sown in a border, it may either be raked in very light and evenly, or covered as above: the plants will appear in three or four weeks, observing, that if sown in boxes, &c. they should be removed to a shady border during the warm weather, and those of the autumn sowing to a warm situation in winter, allowing them also some protection from frost.

In the spring, or beginning of summer, when the plants of either sowing are one or two inches high, they should be planted out in somewhat shady borders, as formerly mentioned, about five or six inches asunder, to remain for flowering; which they will all effect the following spring, when those of good properties should be marked, and the others may be transplanted into the common flower-borders.

Observe, that although all the select varieties may be multiplied plentifully by dividing the roots as directed below; yet it is necessary to raise a quantity of seedlings every two or three years, both to obtain new varieties, and to keep up a stock of young plants to succeed the old ones, which after the third year's bloom rarely flower so strong and fair as the one or two years old seedlings.

It is proper likewise to continue increasing the more excellent sorts, by parting the roots.

By Parting the Roots.—By this method all the sorts may be propagated in great abundance every year; for the roots multiply exceedingly by off-sets into large bunches, so as to admit of slipping or parting annually in autumn; and every slip furnished with some fibres will readily grow, become a good plant, and flower the following spring; so that, in the propagation by parting the roots, any particular approved sort may be multiplied every year at pleasure.

The proper time of year for this work is any time in the beginning of autumn, after the plants have done flowering; or may be

performed in the spring, in March or April: but if performed in July or August, the slips will have good time to get strength before winter, so as to flower strong next spring.

At the proper time, therefore, take up the plants out of the ground, and divide each bunch into several slips, not too small, unless where as great an increase as possible is wanted; being careful to preserve some root to each slip: they are then to be planted in a fresh dug border, enriched with dung, setting them five or six inches asunder; give water directly, and repeat it occasionally till they have taken good root.

Auricula Kinds.

2. PRIMULA *Auricula*.

Auricula Ursti, or *Bear's-car*; but commonly called *Auricula*.] Hath a thick fibrated root, crowned by a cluster of oblong, broad, fleshy, serrated, smooth leaves, resembling the shape of a bear's-car, and amidst them upright flower-stalks from about three or four to six or eight inches high, terminated by an umbellate cluster of beautiful flowers, of many different colours and variegation in the varieties.

It is a native of the Alps, but has long been a resident of our gardens.

Varieties of this.] The varieties of this are amazingly numerous both in the diversity of the leaves and flowers, such as oblong-leaved—roundish-leaved—broad-leaved—narrow-leaved—green-leaved—white, or mealy-leaved, being covered with a fine mealy dust or farina. And of flowers there are, purple-flowered, numerous sorts of lighter or darker shades, stripes, and variegations—red-flowered, numerous varieties of lighter or darker reds, striped and variegated sorts—yellow-flowered, several varieties, as bright yellows, buff-coloured, dun-coloured—double purple-flowered, double yellow-flowered, variegated purples, and innumerable other most beautiful varieties. All the varieties, both plain-coloured and variegated sorts, have a circular eye in the middle of each flower, and of which there are, yellow-eyed—white-eyed—and the petals in many of the sorts are powdered with a most delicate farina, or mealy powder, which contributes exceedingly to the beauty of the flowers.

Of the above principal varieties there are innumerable diversities, and many new ones annually acquired, which being all first obtained from seeds; though as the seedlings vary so greatly, it is probable that not one in a hundred may prove a real good flower; but when once any excellent new varieties are gained, they may be increased annually by off-sets, to a large stock, and thereby continued for ages; and the fine sorts, according as they are obtained,

tained, are all named by the florists, sometimes by that of the person who first raised them, but more frequently that of some illustrious personage, which they number and book accordingly.

They all flower in April and May, continuing a month or six weeks in beauty, and ripen plenty of seeds in June.

All the varieties are hardy, herbaceous, ever-green perennials, that prosper in any common soil of a garden not too wet in winter; for being somewhat succulent, a very humid soil in that season is apt to rot them: allowing them, however, any moderately dry soil, they will stand all weathers the year round.

Considered as flowery plants, they claim precedence of most other spring flowers, for their admirable beauty and wonderful variety; and among florists are esteemed the most beautiful of their prize and stage flowers, the fine sorts being planted in pots, in order for placing them upon elevated covered stages or stands, during their bloom, both to show the flowers to greater advantage, and to defend them from the full sun and showers of rain, which would impair their beauty, and hasten their decay: a share of the common sorts should also be disposed in the open borders in assemblage; or you may likewise plant a collection together in some bed or border, to show a general bloom; for they will prosper in any open ground, not under shade and drip of trees, &c. and are rarely much injured by the most inclement weather.

But a quantity of the principal varieties with requisite properties should always be kept in pots, in order for moving to different situations for the advantage of blowing the flowers in the greatest perfection.

The principal properties necessary to constitute a good Auricula, are,—the flower-stem should be upright, tall, and strong enough to support its cluster of flowers tolerably upright; the cluster or truss of flowers should be large and regular, somewhat of a roundish form, all the florets of the bunch being sustained on short pedicles, in order to support the whole in a proper position, to form the truss close and regular; the florets should be large, and the top spreading flat and regularly around, and the eye of each floret large, circular, and bright.

Flowers having nearly the above properties, being of fine colours, particularly the most beautiful variegated kinds, are proper sorts to plant in pots (twenty-fours or thirty-twos) for stage flowers; so that when you raise seedlings, &c. you should previously see them

blow, to discover their properties before you pot them, which may be done early in autumn, when the flowering is past, planting one plant in each pot, and place them in a shady border all summer, and in a warm situation in winter; and in spring, according as the flowers open, place them on some covered stage, as before observed.

But in the culture of the fine varieties of Auriculas, the florists generally prepare a particular compost earth; the principal one is light earth from some pasture ground, the top spit with the sward, or any other good light mould, and neats dung or good dry rotten hot-bed dung, having of the earth and dung an equal portion of each, and about half the quantity of drift or sea sand; and sometimes where rotten wood, that is become earthy, such as willow earth, old rotten tan, sawdust, &c. can be obtained, a portion is also added, mixing and forming the whole into an heap, to remain about a year, turning it over several times, and it will be of a proper temperature for use. See COMPOST.

In default, however, of the above mixtures, you may take any good light earth of a garden, blended with an equal portion of perfectly dry-rotten dung, and a little drift sand if possible.

Their Propagation and General Culture.

The method of propagating all these plants is by seed, to gain new varieties, and by slipping the roots to multiply the approved kinds.

By Seed.—By raising seedling plants we are sure to gain some new varieties; and being raised one year, they begin to flower the next, though it is probable, that out of hundreds, there may be but very few real fine flowers; but when once any new excellent sorts are so obtained, they multiply annually by off-sets to increase the stock.

The seed generally ripens in June, and should be sown in July or August, not later however than September; or it may be done in spring; but by sowing early in autumn, you gain time.

For this purpose get some wide pots or boxes filled with light rich compost; sow the seed on the surface, and cover it scarcely a straw's breadth deep, and directly place the pots or boxes where they may have only the morning sun during the hot weather, giving them moderate waterings; and if sown early in autumn, the seedlings will probably rise in tolerable plenty the same year; in October, however, remove the pots, &c. to a warm sunny situation for the winter; or may be placed in a garden-frame to have shelter from frost, and excessive wet or snow; but let them

enjoy the free air in all moderate weather; in March or April, replace them again in the shade to have only the morning sun, for the quite young seedlings of these plants are unable to bear the sun fully; therefore continue them in this situation all spring and summer, supplying them with water in dry weather: and in July following take opportunity of moist weather, and prick them out in nursery-beds, or in wide pots or boxes, filled with good compost; in either of which prick the seedlings pretty close, i. e. two or three inches asunder, giving water and occasional shade from the sun till fresh rooted, or if in pots or boxes, remove them to a shady situation: in these beds or pots, &c. they are to remain till they flower, which will be spring following, when all the good sorts should be marked, or may be directly transplanted into separate small pots (forty-eights) one plant in each; and next year they will all blow in perfection, and discover their properties more perfectly, then may be shifted into larger pots (thirty-twos); observing to manage them as hereafter directed.

The ordinary sorts will do to plant in the common borders, to form variety amongst other low spring flowers.

By Off-sets, or Dividing the Roots.—By this method all the select varieties are propagated, for the roots throw out off-sets in tolerable plenty, each of which being slipped off and planted, will next spring produce flowers exactly like those of the parent plant, and these in their turn produce off-sets for further propagation, which will produce also the same sort of flowers, &c. and thus may the choice varieties be annually increased, and continued for years.

The season for performing this work is, occasionally both in spring and autumn; if only to slip off any outside off-sets that appear, it may be done in spring, either before or at the time of flowering; though towards autumn, about July or August, when the flowering season is past, and the plants having had the spring and summer's growth to furnish strong off-sets, will be the most eligible season for any general propagation by slips: the roots may be then either taken up and divided into several slips, where a considerable increase is required; or the roots may stand, and only detach any outside off-sets, as aforesaid; and in either season or method of slipping or dividing the plants, proceed to pot the off-sets or slips of the choice sorts separately; but the common kinds may be planted in beds or borders, of light rich earth.

Having, however, slipped or divided the off-

sets of the fine varieties, then being furnished with a quantity of small pots (twenty-fours or thirty-twos) according to the size of the slips, filling them with the proper compost, plant one off-set in each pot; give some water to settle the earth, and promote their striking; and then place them under some shady fence, upon level clean ground, to have only the morning sun all summer, repeating the waterings in dry weather two or three times a week; and at the approach of winter place them under some warm wall open to the sun, to remain until spring, and begin to show their flowers, when the choice sorts should be placed on the Auricula stage, in order to protect the bloom from the weather, and preserve them as long as possible in beauty.

General Management.

In the culture of the fine Auriculas in pots, it is proper, as before hinted, to have some sort of covered stage for the principal sorts, having the front open to the morning sun only, on which to arrange the pots of plants when in bloom, to show the flowers to good advantage, and protect them from rain and too much sun: the stage should have several ranges of narrow shelves, one above and behind another, theatrically, on which to set the pots; some small stages are so constructed as to turn round any way at pleasure, more or less, to the sun; and some are formed circular, having the shelves arranged in a pyramidal manner: and some have canvas curtains, or a defence of mats, &c. to draw or let down occasionally, either to keep off driving rains, or afford shade from the sun, and shelter from cutting winds where the stage is much exposed.

On these stages the pots of plants should be placed in the spring, according as the flowers of each plant begin to open, and not before, to remain during the continuance of the beauty of the flowers; observing to supply them with water about three times a week, or every other morning, giving it only to the earth in the pots; at least let none fall on the flowers, for wet would greatly deface the bloom.

When the full blow is past, remove the pots directly into the full air in a shady border, to receive the full benefit of the free air and rains, to encourage their off-sets and the ripening of seeds. During the summer season they should remain constantly in the shade, but not under drip of trees, and must have proper waterings in dry weather.

In August the plants should be fresh potted into new compost; but more especially such plants as have thrown out some good off-sets, should have them separated and potted, as already

ready directed; though small plants that have made no progress in off-sets, may remain unremoved another year; observing, however, the beginning or middle of August is the best time for fresh potting them, still continuing them in the shade during the hot weather, and supply them with water.

At the approach of winter remove the pots under some warm situation open to the sun, to remain till spring; or may be placed under some hoop arches, or in a garden frame, and there occasionally sheltered from severe frost, great rains, and snow, to preserve them in greater vigour, but must constantly enjoy the full air in all mild weather; in default, however, of such shelters, arrange the pots close along under a warm wall, for the plants are very hardy; only observing, that when very wet or snowy weather begins, lay the pots down on one side with the plants towards the sun, to prevent their receiving too much moisture, which would rot these kind of plants: but in settled dry weather, and as the spring advances, place them upright again, that the flower-bud may take its proper upright direction.

In spring, about the beginning or middle of February, or early in March, it is proper to mould up the pots with some fresh compost; first take out some of the old mould to a convenient moderate depth without disturbing the roots, and clear the plants from any decayed leaves, then immediately fill up the pots with new earth: this will prove a very beneficial dressing both in strengthening the bloom and encouraging the growth of off-sets.

When the plants begin to show their flower-buds, occasional shelter, if sharp-frosts happen, will be of great service in preserving them from being blighted, which often prevents their blooming fair, and sometimes entirely destroys the flower; it is therefore advisable to use a slight covering of mats every frosty or very cold night about the first shooting of the buds.

And according as the flowers open fairly, remove the pots on the stage, &c. to remain to blow as already directed.

The further management of the potted plants after flowering is the same as before, and which is to be repeated every year.

The above intimations of culture of Auriculas in pots are principally advised for the more curious esteemed varieties, productive of the finest flowers of superior beauty in their respective particular properties; and as to the common kinds, no more is necessary in the culture than that of other hardy perennial flowers either in pots or borders, &c.

3. PRIMULA farinosa.

Farinous, Red Primula, commonly called Bird's-eye.] Hath a fibrous root, with a small scaly head, crowned by several long, smooth, crenated leaves, mealy underneath, and upright flower-stalks half a foot high, terminated by a cluster of small red flowers, having yellow eyes in the centre.

It grows naturally in the North, but is cultivated in many gardens as a flowering plant; it produces its flowers in the spring.

Plant it in any common border, it will flower annually, and multiply plentifully by off-sets.

PRINOS, Winterberry.

Two shrubby species compose this genus; one is deciduous, the other is an ever-green, both hardy shrubs for the shrubbery, &c. obtain eight or ten feet stature, garnished with oblong leaves, and monopetalous wheel-shaped flowers.

Class and order, *Hexandria Monogynia*.

Characters.] CALYX is monophyllous, six-parted, and permanent. COROLLA is one wheel-shaped petal cut into six oval segments. STAMINA, six awl-shaped short filaments, and oblong obtuse antheræ. PISTILLUM, an oval germen terminating in a short style, and obtuse stigma. PERICARPIUM, a roundish sex-locular berry, having six hard seeds.

The species are,

1. PRINOS verticillata (deciduous).

Whorled Virginia Winterberry.] Grows six or eight feet high, very branchy from bottom to top; large spear-shaped longitudinally-sawed leaves placed alternately, and small flowers from the sides of the branches, some singly, others two or three together, succeeded by purple berries remaining all winter.

2. PRINOS glabra (ever-green).

Smooth Canada Winterberry.] Grows eight or ten feet high, branchy quite from the bottom, oblong spear-shaped leaves serrated at the top, placed alternately, and at the axillas small flowers two or three together, succeeded by purplish berries continuing all the winter.

Both these shrubs are of America, are tolerably hardy, especially the deciduous kind, and have been long in our gardens as ornamental shrubs to increase the collection in the shrubbery, &c.

But the ever-green kind being of a more tender nature, it is also kept in pots while young, in order to be wintered in a green-house, &c.

They are propagated mostly by seed sown soon after they are ripe, or early in spring, in a bed of light earth, covering them full half an inch deep; some of which will probably come up the first spring; but if not sown till the spring, they often remain in the ground

till the spring following, unless forwarded in a hot-bed: when the plants are one or two years old, they should be planted out in nursery rows; it will also be proper to plant some of the ever-green kind in pots, to have occasional shelter the first two or three winters, as being rather somewhat tender whilst young; but when they have gathered strength, turn some of them out into the full ground, and retain some in pots as green-house plants.

PROTEA, Silver-tree.

A genus comprising, for our green-house collections, two species of African exotics, remarkably ornamental silvery-leaved ever-greens of the woody-like tribe, growing eight or ten feet high, adorned with spear-shaped, singularly beautiful leaves of a silky silvery appearance; and flowers produced in oval heads, each consisting of many small monopetalous florets in one general calyx.

Class and order, *Tetrandria Monogynia*.

Characters.] **CALYX**, a general, imbricated perianthium, containing many florets, having each a partial, monophyllous cup. **COROLLA**, a uniform general flower, consisting of many monopetalous florets, having the limb or upper part cut into four parts, smooth and spreading. **STAMINA**, four filaments inserted into the corolla, and incumbent antheræ. **PISTILLUM**, a roundish germen, setaceous style, and obtuse stigma. **PERICARPIUM**, none; one seed to each floret, lodged in its calyx, the whole together in a roundish head.

There are many species of *Protea*, but those of note in our gardens are,

1. *PROTEA argentea*.

Silvery Cape Protea, or common Silver-tree.]

Rises with an upright stem, having a purplish bark, and dividing into several erect branches, decorated with broad, lanceolate, acute, hairy-silky, white silvery, shining leaves, continuing all the year;—rarely flowering in this country.

2. *PROTEA conifera*.

Cone-bearing Cape Protea.] Rises with an upright stem, dividing upward into several branches, garnished with linear-lanceolate, acute, smooth, entire leaves, shining and silvery; of a fine appearance all the year.

Both these elegant plants are natives of Africa, about the Cape of Good Hope; retained here in all our curious green-house collections, in which they have a conspicuously fine appearance in their singular silvery leaves, forming a beautiful variety the year round.

They are propagated by seeds, procured from the places of their native growth; which, as soon as obtained, sow in pots placed in a moderate hot-bed; and when the plants are

come up, give moderate air, or place them in an airy glass case, or towards the front of a green-house; and afterwards managed as other similar exotics of that conservatory.

They are also sometimes propagated by cuttings, in spring and summer, by the same assistance of a hot-bed.

PRUNING.

Pruning is an operation of the knife, performed upon trees occasionally, in order both to give them any desired form, and to retrench or reduce irregular and redundant or superfluous growths, or whatever creates confusion and disorder.

But this operation is particularly necessary to be practised on many sorts of fruit-trees, more especially the dwarf sorts, such as all kinds of wall and espalier fruit-trees; it is also necessary to be performed occasionally upon standard trees, both dwarfs and half and full standards, to all of which proper Pruning is necessary; some sorts annually, as all kinds of wall trees, espaliers, and most other dwarf or trained fruit-trees; which is requisite in order to preserve the proper figure, and to keep them within their limited bounds, as well as to promote fruitfulness; but as to common standards, whose heads have full scope of growth every way, they require but very little Pruning, except just to retrench any occasional redundancy, ill-growing branch, and dead wood. Wall trees and espaliers, however, require a general regulation of Pruning twice every year, in summer, to retrench the evidently superfluous and ill-placed shoots of the year, and to train in a supply of the most regular ones; and in winter to give a general regulation both to the supply of young wood left in summer, and to the old branches where necessary.

For in Pruning wall trees and espaliers it is to be observed, that as these trees have their branches arranged with great regularity to the right and left, one above another parallelly, four, five, or six inches asunder, forming a regular spread, so as the branches of each tree completely cover a certain space of walling, &c. and as the whole spread of branches constantly send forth every year a great number of unnecessary and useless shoots; and that each tree being limited to a certain space, as just observed, an annual Pruning is consequently most necessary to retrench the redundancies, and all irregular and bad shoots, to give the proper bearing branches due room, as well as to enable us to confine each tree within its allotted limits, consistent with its regular form.

The first Pruning necessary for wall fruit-trees, is when we attempt to give the head its

first

first regular formation, effected by Pruning short or heading down in spring all the shoots produced the first year from budding and grafting, that is, the first shoots from the budding, &c. when a year old being generally pruned down in March, within four or five eyes of the bottom, whereby it throws all the sap into the remaining lower buds, and thus, instead of running up to one stem, it pushes forth several strong shoots from the lower part the ensuing summer, so as to fill the allotted space of walling and espalier regularly quite from the bottom; which shoots being trained straight and regular in a spreading manner, each at full length all summer; and in winter or spring following, if a supply of more principal shoots shall seem necessary to form the head more effectually, prune short also these shoots, each to four or five eyes; and each of them will throw out the like number of shoots the same year, which, according as they advance in length, train at regular distances at full length during the summer, as before observed; for the shoots of wall trees should not generally be shortened in the summer season, for this would cause them to push forth many superfluous, unnecessary lateral shoots; though sometimes, in order to fill a vacancy as soon as possible, strong young shoots being pinched or pruned early in the season, May or beginning of June, to four or five eyes, will throw out several proper shoots the same summer; repeating, however, the work of Pruning short occasionally one or two years, &c. as above, either in general or to particular shoots as it may seem necessary till a proper set of branches are by that means obtained to give the head of the tree a proper formation; afterwards Pruning short is to be omitted, except occasionally to any particular shoot to fill a vacant space: but some sorts of wall trees require almost a general shortening of their supply of shoots, such as peaches, nectarines, &c. which bear only on the young wood, have that of each year shortened, to force out a supply of shoots for future bearing: other sorts of wall trees and espaliers are not, in the general course of Pruning, to be shortened, such as pears, apples, plums, and cherries, which continue bearing in the same wood of from two or three to many years' growth. See ESPALIERS.

After the trees are thus furnished with a proper spread of branches trained regularly to the wall and espalier, they will every year throw out many more shoots than are wanted, or can be converted to use, by being some too numerous, others ill placed, and others of a bad growth; all of which must therefore be regulated accordingly by proper Pruning: for

as the regular figure of the tree, well furnished in every part equally from the bottom to the top of the wall or espalier with proper branches, capable of producing a reasonable quantity of good fruit, are the principal objects of Pruning, all our operations must be directed to these ends.

We must therefore be careful to ease the trees of every thing that is either superfluous, irregular, or hurtful, by Pruning twice every year, a summer and a winter Pruning. We call that superfluous which though good and well placed, yet is more than wanted or can be properly laid in, and that irregular which is so ill placed as it cannot be trained with regularity to the wall or espalier, such as all fore-right shoots, being such as grow immediately from the front or back of the branches in a fore-right direction, which though good of themselves, yet their situation renders them irregular or unfit for training; and we call that hurtful which is in itself of bad growth, such as all very rank or singularly luxuriant rude shoots; so that the superfluous or redundant growths should be thinned by Pruning out all that seem to cause confusion; and the irregular and hurtful rank shoots should be displaced, cutting every thing of all these sorts off quite close to the place from whence they proceed, leaving, however, a proper supply, more or less, of the regular or best placed side-shoots where necessary, so as to preserve every part well furnished with bearing wood, trained straight and close to the wall or espalier at equal distances; observing some sort of wall trees, &c. require a general annual supply of young wood, such as peach and all other trees which bear only on the shoots of a year old; others require only an occasional supply of wood, such as apples, pears, &c. and all other kinds that bear on the old wood of from two or three to ten or twenty years old or more; so that the same branches continuing in bearing many years, the trees require only a supply of young shoots now and then to replace any worn out and dead branches. See *Summer and Winter Pruning*.

For the mystery of Pruning consists in being well acquainted with the nature of bearing of the different sorts of trees, and forming an early judgment of the future event of shoots and branches, and many other circumstances, for which some principal rules may be given; but there are particular instances which cannot be judged of but upon the spot, and depend chiefly upon practice and observation.

The nature or mode of bearing of the different sorts of wall and espalier trees, &c. is materially to be considered in Pruning.

For

For example, peaches, nectarines, apricots, &c. all produce their fruit principally upon the young wood of a year old; that is, the shoots produced this year bear the fruit the year following, and the same of every year's shoots, so that consequently, in all these trees, a general supply of the best regular shoots of each year must be every where preserved, both in summer and winter Pruning, at regular distances quite from the very bottom to the extremity of the tree one very side, in such order as to seem coming up regularly one after another; and generally trained principally all at full length during their summer's growth; but in winter Pruning, a general shortening, less or more, according to the strength of the different shoots, is necessary in order to promote their throwing out more effectually a supply of young wood the ensuing summer, from the lateral eyes, in proper places for training in for next year's bearing; the fruit-buds being generally produced all along their sides immediately from the eyes, they rarely forming any considerable fruit-spurs, as in the apple, pear, &c. but the same shoots both produce the fruit and a supply of shoots at the same time for the succeeding year's bearing, though it should be remarked, that all these trees also bear on casual small natural spurs, sometimes arising on the two and three years' wood, one or two inches in length, generally well furnished with blossom buds in the proper season; and should generally be preserved for bearing; but always depend on the main young shoots as above for the principal bearers.

Vines also produce their fruit always upon the young wood, shoots of the same year arising from the eyes of the last year's wood only, and must therefore have a general supply of the best regular shoots of each year trained in, which in winter Pruning must be shortened to a few eyes or joints, in order to force out shoots from their lower parts only, properly situated to lay in for bearing the fruit the following year.

Figs bear also only upon the young wood of a year old, and a general supply of it is therefore necessary every year; but these shoots must at no time be shortened, unless the ends are dead, because they always bear principally towards the extreme part of the shoots, which if shortened would take the bearing or fruitful parts away: besides, these trees for the general part naturally throw out a sufficient supply of shoots every year for future bearing without the precaution of shortening.

And as to apple, pear, plum, and cherry trees, they generally bear principally on spurs

arising in the general branches, of from two or three to ten or twenty years old, the same branches and spurs continuing bearing a great number of years, so that having once procured a proper set of branches, in the manner already directed, to form a spreading head, no farther supply of wood is wanted than only some occasional shoots now and then to supply the place of any casual worn-out or dead branch as before hinted; the above-mentioned spurs or fruit-buds are short robust shoots, of from about half an inch to one or two inches long, arising naturally in these trees, first towards the once extreme parts of the branches of two or three years old; and as the branch increases in length, the number of fruit-buds increases likewise accordingly; this therefore determines, that in the general course of Pruning all these kind of trees, their branches that are trained in for bearing must not be pruned or shortened, but trained at full length; for if they were shortened, it would divest them of the very parts where fruit-buds would have first appeared, and, instead thereof, would throw out a number of strong unnecessary wood-shoots, from all the remaining eyes; therefore all the shoots or branches of these trees should be trained principally at full length, and as they advance still continue them entire; thus they will all readily form the aforementioned little spurs or fruit buds from almost every eye; when indeed there is a vacancy, and there is only one shoot, where two or three may be requisite, in which case pruning or shortening is allowable in these trees, to force out the supply required. See the different sorts under their proper *genera*, also the article DWARF-TREES.

In these trees great care is necessary to preserve all the proper fruit-buds or spurs, which are readily distinguished by their short, thick, robust growth, rarely exceeding one or two inches long.

In the general course of Pruning all sorts of wall and espalier trees, that when displacing the superfluous and ill-placed wood, &c. always take them off quite close both in the summer and winter Prunings, not leaving any spurs or stumps of them an inch or two long, as often done, which fills the tree full of disagreeable stumps, and which pushing out strongly from every eye, crowds the tree with a multitude of unnecessary and irregular shoots, and causes great confusion and obscurity, and exhausts the sap to no purpose, as well as occasions a great deal of labour to retrench them; remember therefore, that all improper and ineffectual shoots and branches, necessary to be displaced, must be taken off quite close

to the place from whence they arise; which in the summer Pruning, if attended to early, while the shoots are quite young and tender, they may readily be rubbed off quite close with the thumb; but when the shoots become older and woody, as they will not readily break, it must be done with a knife, cutting them as close as possible; and all winter Pruning must always be performed with a knife.

It should also generally be observed in Pruning in summer, that all the necessary supply of regular shoots that are left for training in, should never be shortened during this season, unless to particular shoots to fill a vacancy, or to reduce within bounds any too long extended shoots; for by a general shortening in this season, all the shoots so treated would soon push again vigorously from every eye, and run your trees into a perfect thicket of useless wood; therefore all sorts, whether they require shortening in the winter Pruning or not, should, in the summer dressing, be layed in at full length.

Two seasons of Pruning are requisite for all sorts of wall and espalier trees,—a summer and a winter Pruning.

Summer Pruning.—The summer Pruning is a most necessary operation; every one must know that in spring and summer wall and espalier-trees abound with a great number of young shoots that require thinning and other reforms to preserve the requisite regularity and beauty of the trees, and encourage the fruit; and the sooner it is performed, the better; it is therefore advisable to begin this work in May or early in June, and timely disburthen the trees of all evidently redundant or superfluous growth, and ill placed and improper or bad shoots; which may be performed with considerably more expedition and exactness than if delayed till after the trees have shot a considerable length and run into confusion and disorder by their shoots forming a thicket, when it will in a manner be impossible to see what you are about; besides the disadvantage of choking up the fruit behind such a thicket of wood and leaves: it is therefore of great importance to proceed in this operation in the month of May or early in June, or when the same year's shoots are sufficiently formed to enable you to make a proper choice; and if begun early in the season, while the young shoots are tender, or soft and herbaceous, as it were, the displacing the ineffectual and superabundant growths may be occasionally effected by detaching or rubbing them off close with the thumb and finger; but when more advanced to a woody state, the pruning-

knife, only, must be employed in that business.

However, at any rate, let the work of summer Pruning be proceeded in before the trees have so far advanced in shooting as to cause much confusion, which would cost you a great deal of pains, precaution, and perplexity, to penetrate and break through the obscurity to determine what is proper to retrench or what to leave.

In this Pruning, we observed above, that a great many more shoots arise from all the principal branches than are wanted, or can possibly be trained with regularity, or than are well placed or proper for the purpose; our business therefore now is to thin and regulate them, by pruning away the superfluous shoots, and all such as are ill-placed and of bad growth as aforesaid: as to superfluous shoots, they are to be considered as such where any tree throws out a redundancy of wood, or much more than what is wanted, or than can be trained in; of these you must now retrench the most irregular placed, weakest, and all such as are evidently not wanted for use, and where two or more shoots any where arise from the same eye, clear all away but one of the best, reserving a sufficiency of the moderately strong and most regular placed side shoots, and always a leading one at the end of every branch, where it commodiously occurs; and all of which retained proper shoots are to be regularly trained in to choose from in the winter Pruning, leaving more or less in proportion, according to what the trees are, or the mode of bearing, as before hinted; though in all those trees that bear always on the young wood, leave at least doubly or trebly more shoots at present than what may appear just necessary, especially of peaches, nectarines, apricots, vines, figs, &c. for it is highly requisite to reserve plenty of regular young wood in summer, to choose from in winter Pruning, to lay in for next year's bearers; but as to apples, pears, plums, cherries, &c. which continue bearing many years on the same branches, should leave only here and there some good well-placed shoots towards the lower parts, or in any vacancy between the main branches till winter; and if then not wanted, they are easily retrenched. Ill placed shoots being such as either grow directly from the front or back of the branches straight fore-right, (called fore-right shoots,) or any other way so ill placed as not to admit of training with regularity, so must all be cut out quite close; and bad or hurtful growths being considered as any very luxuriant shoots, distinguished from the others by their singularly rank

rank, vigorous shooting, and are like to prove injurious by drawing all the nourishment, and impoverishing the neighbouring ones that are of more moderate growth, should generally be removed, except where any may seem proper to leave to fill a vacant space, in which it may be pinched or pruned early to three, four, or five eyes, when it will furnish you with the like number of more moderate shoots to fill the vacancy.

Where however a tree is in general inclined to luxuriance, it is proper to retain as many of the regular shoots as can be commodiously trained in with any regularity, in order to divide and exhaust the too abundant sap, which causes the luxuriance; for by humouring somewhat the natural inclination of luxuriant trees by leaving plenty of branches and these mostly at full length, is the only method by which we can the most readily reduce them to a more moderate state of growth.

Pay particular attention always to the lower parts of your trees; for frequently we shall find proper shoots arising in places necessary to be trained in, either to supply a present or an apparent future vacancy, or as a reserve to replace any decayed or worn-out or other bad branch, so that if moderately strong well-placed shoots arise in such parts, they are particularly to be regarded at this time; and in winter Pruning, such of them as are not wanted may be easily cut out.

All weak trifling shoots should now also be taken out, unless any shall appear useful to fill a vacancy, or likely to be of service hereafter.

Observe in this Pruning not to disturb the natural fruit-buds or spurs, before described.

After having summer Pruned and cleared any tree from all useless shoots as above, let all the remaining proper shoots be directly, or as soon as they are long enough, trained in straight and close to the wall or espaliers, and all of them at full length during the summer season, for the reasons before given; not shortening any at this time, except, as before observed, when there is any great vacancy in some particular parts, it may be proper to cut or prune one or more contiguous shoots to three, four, or five eyes or buds, in order to promote an emission of laterals accordingly the same season, more effectually to supply the vacant spaces; but let all the rest be trained at full length till winter Pruning, when they must undergo another regulation; and shorten those of such trees as require it, as peach, nectarine, &c.

The work of training in the shoots in this season is, if against walls, both by nailing, by

means of proper shreds and nails, and occasionally by fastening in the smaller shoots, with little sticks or twigs stuck between the main branches and the wall; and for espaliers, tie them with small osiers, rushes, or bals strings.

Having thus summer dressed and trained your trees, it will be necessary to review them occasionally, in order to reform such branches or shoots as may have started from their places or taken a wrong direction, also that according as any fresh irregular shoots produced since the general dressing may be displaced; and likewise as the already trained shoots advance in length or project from the wall or espalier, they should be trained in close, still continuing them at full length during their summer's growth; for every thing should be kept close and regular all summer, whereby your trees will appear beautiful to the eye, and the fruit will show itself, and attain its due perfection.

For by thus properly summer Pruning and training wall and espalier trees early in the summer, you preserve their regularity and prosperity; and by clearing out all the unnecessary and useless growth, training the rest close and regular, the fruit will receive all requisite advantage from the sun, air, rains, &c. and it will of course attain the greater perfection both in size, beauty, and flavour.

Winter Pruning.—In the winter Pruning, a general regulation must be observed both of the mother branches, as required, and the supply of young wood laid in the preceding summer; and the proper time for this work is, in most wall-trees, any time in open weather from the fall of the leaf in November until March.

In performing this work of winter Pruning, it is proper to unnailed or loosen great part of the branches, particularly of peaches, nectarines, apricots, vines, and such other trees, as require an annual supply of young wood, and some considerable regulation in the general branches.

First look over all the principal or mother branches, and examine if any are worn out or not furnished with parts proper for bearing fruit, according to the rules before illustrated with respect to the nature of bearing of the different sorts of trees; and let such branches be cut down either to the great branch from which they proceed, or to any lower shoot or good branch they may support toward their bottom part, leaving these to supply its place; likewise examine if any branches are become too long for the allotted space either at sides or top, and let them be reformed accordingly by shortening them down to some lower shoot or

or branch properly situated to supply the place ; being careful that every branch terminates in a young shoot of some sort for a leader, especially in all parts where room to extend them, according as the limited space admits, having the leader either placed naturally at the termination of the branch ; or, where too long in any particular parts of the tree, prune the branch conformably to some lower shoot, &c. so as it may still terminate in a proper leader, and not generally cut the extended branches to naked stumpy or stubbed ends, as often practised by inexperienced pruners.

From the principal or larger branches, pass to the young wood of the year : or, however, in proceeding in this general winter Pruning both in the occasional reform among the principal or older branches, and more general regulation requisite in the young wood of the year, or shoots of the preceding summer, by observing the above intimations relative to the principal branches, the Pruning in the whole, both on the old and young wood, may be carried on regularly together at the same time, cutting out or retaining according to circumstances ; as for instance, in the older wood observing the particulars as above, and as hereafter, and in the general supply of young wood, cut out close all fore-right and other irregular shoots that may have been omitted in the summer Pruning ; likewise all very weak shoots, and those of very luxuriant growth, unless it be necessary to keep some to supply a vacant place ; then of the remaining regular shoots, you are to select a greater or smaller portion to leave either as a general supply for next year's bearing, as is requisite for peaches, nectarines, apricots, vines, and figs ; or only in others some occasional shoots, such as in full-trained apple, pear, plum, and cherry trees, &c. either sometimes to furnish some casual vacancies, or to supply the places of any defective or improper branches, or ineffectual bearers, as may casually occur, or that of decayed or dead wood.

But as peach, nectarines, apricots, vines, and figs, always bear principally on the year-old wood as before noticed, a general supply of young shoots must be left in every part from bottom to top at regular distances, and, at the same time, some proportional part of the most naked old wood, and of the two preceding years past bearers, pruned out to make proper room for this requisite young successional supply of future bearers next summer, necessary now to be retained in a general manner, both laterally, and as terminals to the general parent branches, which should

now be pruned accordingly ; and mostly all the said supply of the present retained shoots, except the fig, must be more or less shortened according to their situation and strength, to encourage their furnishing more readily a proper supply of shoots in spring and summer for the succeeding year's bearing, as before observed, leaving the strongest shoots always the longest, as is more fully explained under each of their respective *genera* ; but as the figs always bear towards the end of the shoots they must not be shortened.

And with respect to the apples, pears, plums, cherries, &c. as they continue to bear on the same branches of from two or three to many years' standing, the said bearers must be continued accordingly ; and the trees only require an occasional supply of young wood, according as any of the branches become defective, or unfit for bearing, and want removing ; which should now, in this winter Pruning, be cut out as it may seem necessary, agreeable to the foregoing intimations ; so should accordingly train in here and there in proper places some good regular young shoots towards the lower part, and where it may seem necessary, to be coming gradually forward to a bearing state, to be ready to replace worn out and other useless branches, to be cut out, as above, according as they may casually occur : and of the young wood, selecting what may appear necessary of the best well-placed shoots for the above occasions, and the superabundance, or those not wanted for that purpose, together with all irregular-placed shoots, rank luxuriant, and other ineffectual growths, should be now cut clean out, close to whence they originate, not leaving any spur or stump thereof, as every one of which, as we before observed, would push out several strong unnecessary shoots the next spring, to the prejudice both of the trees and fruit ; have particular regard to preserve the shoots at the termination of all the already trained branches entire, not however more than one shoot to terminate each branch ; preserve also carefully all the proper fruit spurs ; likewise observe, that the supply of young wood occasionally reserved, and the branches in general of these trees, should all be trained in at full length, and continued so in future, as far as the limited space will admit : and according as any extend above the wall or espalier or any where beyond their proper limits, they should be pruned down with discretion to some convenient bud, or lateral shoot, or lower branch, which train also entire.

In this Pruning, as in the summer dressing,

it is of importance to have a strict eye to the lower parts of wall-trees, &c. to see if there is any present vacancy or any that apparently will soon happen; in which cases, if any good shoot is situated contiguous, it should be trained in either at full length, or shorten it to a few eyes to force out two or more shoots if they shall seem necessary; for precaution should ever be observed in taking care to have betimes a sufficient stock of young wood coming forward to fill up any casual vacancy, and substitute a new set of branches in place of such as are either decayed or stand in need of retrenchment.

Sometimes in wall-trees and espaliers there are many large disagreeable barren spurs, consisting both of old worn-out fruit-spurs, and of clusters of stumps of shortened shoots projecting considerably from the branches, occasioned by unskilful Pruning when retrenching the superabundant and irregular shoots, which, instead of being cut out close, are stumped off to an inch or two long, and in the course of a few years, forming numerous barren stumps, as above said, and very little fruit, the trees appear like a stumped hedge; it is therefore, in this season of Pruning, advisable to reform them as well as possible by cutting all the most disagreeable stumps clean out close to the branches, leaving these at full length, especially of apples, pears, &c. as before advised; and reserve an occasional supply of young wood in different parts; and thus in two or three years you may reduce such trees to a regular figure and a proper state of bearing.

Bad Pruning ruins many a good tree, as is observable in numerous gardens, where the wall trees and espaliers appear as just above described, pruned every year, yet never produce any tolerable crop of fruit.

The reason is, the operation or art of Pruning is much more generally practised than understood; different pruners have different ideas of Pruning: many proceed upon little or no principle, and often prune all trees alike; and their idea of Pruning often consists in retrenching annually most of the young shoots, and shortening all the branches of every tree without exception, to the great injury of some sorts, and retarding their bearing: likewise many pruners, in retrenching the superfluous and irregular shoots, instead of cutting close, as formerly observed, they often stump them off to about one or two inches long; these remaining stumps shoot out again from every eye, and fill the tree with more numerous useless shoots than before,

which being also pruned down to stumps of an inch or two long, as above, practising the same every Pruning, so as in the course of a few years every branch is loaded with clusters of large rugged barren spurs, formed wholly of the stumps of shortened shoots, occupying the places where fruit buds or natural spurs might be expected: and, as before intimated, it is an equally erroneous idea, observable in many pruners, that all the retained shoots of wall an espalier trees in general must, in the annual Pruning, undergo the discipline of the knife, so shorten all without distinction or reluctance, often too with so much severity on trees that should not be shortened, as to destroy the very parts where fruit-buds would have been produced; they thinking this general shortening necessary to strengthen the branches; which, however, in many sorts, promotes a too vigorous growth, and retards their bearing; particularly in trees that produce their fruit-on natural spurs, forming themselves gradually all along the sides of the branches, often first towards the upper part, or that which was once the extreme part of the shoots, that shortening not only cuts off these first fruitful parts of the branches, but throws the sap back with so much vigour to the remaining buds, that, instead of forming fruit spurs, almost every bud pushes out luxuriant shoots, and the trees are continually crowded with unnecessary wood, causing a great annual trouble to retrench it, without the pleasure of having a quarter of a crop of fruit; besides the annually cutting out so much strong wood is very prejudicial to some sorts of fruit-trees.

Too severe injudicious Pruning in strong wood is greatly prejudicial to the health of some sorts of stone-fruit-trees, in particular, by causing them to gum and soon decay.

Plums and cherries, in particular, are often greatly damaged by a too severe discipline of the knife, these trees being very liable to gum by large amputations: it is therefore of importance to attend to these trees well in the summer Pruning, to retrench all the superfluous and irregular shoots betimes in the summer while quite young, and pinch others occasionally where wood is wanted to fill vacancies, so as to require but little Pruning out of large wood in winter.

But if our former hints in the summer and winter Pruning are attended to in retrenching the useless wood every year at the time advised, you will always preserve your trees free from all incumbrance; and every part will be regularly filled with bearing wood, and their general management will prove easy.

A gene-

A general nailing, &c. must every year be performed, according as we advance with the Pruning.

Therefore it is proper that every tree, as soon as pruned, be directly nailed to the wall, or if espaliers, tie or nail them to the treillage, observing, that in the winter Pruning, as the work of nailing, &c. will require to be performed more or less upon all the branches, we must be careful to train them with great regularity, nailing them along horizontally, as straight and close as possible; never cross any of the branches, but train them distinct and parallel four to five or six inches asunder, as formerly advised, or in proportion to the size of the leaves and fruit of the different sorts, making the opposite branches of each side arrange equally in the same position.

Thus far is principally all we have to advance respecting the general mode of Pruning wall and espalier trees; particulars for each sort being noticed more fully under their proper *genera*; but what we have here advanced under this article *Pruning*, is to convey some general hints to unexperienced pruners, although there are many expedients and resources, not to be discovered but by repeated practice and observation.

Pruning Standards.

Standard fruit trees require but very little Pruning: for as their branches have full scope above to extend themselves every way, they must not be shortened; besides, as our standard fruit-trees, consisting principally of apples, pears, plums, and cherries, which, as before said, bear fruit on natural spurs arising towards the upper parts of the branches, which, as observed in the wall-tree and espalier Pruning, determines that we must not shorten them, nor practise any other Pruning than just to reform any great irregularity, &c.

The first occasional Pruning, however, necessary for standard fruit-trees, is the first two years of their growth, in order to form their heads somewhat regular, by retrenching any irregular shoots; and when designed to have them form more regular spreading heads, it is customary to prune the first shoots, when a year old, down to four or five eyes, in order to force out lateral shoots from these lower buds the following summer, to give the head a proper formation. After this, suffer the branches to take their natural growth, except that, if, while the trees are young, any very luxuriant shoots ramble away considerably from all the others, and draw most of the nourishment, it is proper to prune them, ei-

ther by retrenching entirely very irregular ones, or shortening others more or less, to some regularity, to branch out consistent with the requisite form of the head.

But let it be remarked in general, that, except in such cases of reducing irregularities, let the heads of all kinds of standards always branch away as fast as possible, both in length and laterally, agreeable to their natural mode of growing; and they will naturally furnish themselves abundantly with bearing wood.

Observe however, that as, in standard fruit-trees of some years' growth, irregularities and disorder will occasionally happen, which should be regulated a little by Pruning the most conspicuously irregular and redundant growths; performing it always in winter.

For instance; where any considerable branches grow right across others, or in any other awkward direction, to incommode or cause confusion, or much irregularity in the head, they should be retrenched close; likewise any branch that rambles considerably from all the rest, should be reduced to order, by cutting it down to some convenient lower branch, so as to preserve some regularity. Where the head is considerably crowded with wood, let the worst of the redundancy be thinned out as regularly as possible, cutting them close to their origin; observe likewise that as sometimes very vigorous shoots arise considerably in the heart of the tree, or towards the bottom of the main branches, often growing upright, and crowd the middle of the head, they should be constantly retrenched to their very bottom; cut out also any very cankered parts, and all decayed wood; and clear off all suckers from the root and stem.

Standard trees thus disburthened from any considerable irregularities and confusion, so as all the proper branches have full scope to spread free and easy in their natural manner, will not fail to repay the trouble in the superior quality of their future fruit.—See each sort under its proper genus, also ORCHARD-TREES.

Pruning Forest Trees, &c.

With respect to Pruning of forest and ornamental trees, flowering shrubs, &c. it is very inconsiderable.

Forest trees, &c. must be suffered to run up as fast as possible, so their heads must not be shortened; all that is necessary is, to prune off lateral branches occasionally from the stem; or if, while young, any lateral shoot of the head is of a very rude rambling growth, it is proper to reduce it as you see convenient; but otherwise suffer the top and general branches

of the head to remain entire, and take their own natural growth; only prune lower stragglers occasionally; observing, however, it is very improper to trim up the stem too high, as often practised to forest trees, as scarce to leave any upper branches to form a head: never, therefore, trim the stem much higher than the full spread of the principal branches; for a full head is both ornamental and essentially necessary to the prosperity of the tree. See PLANTING.

And as to the shrub kind, they should also, for the general part, take their own growth at top; and only prune occasionally any lower stragglers, from the lower part of the stem, or any very irregular rambling shoot of the head, and all dead wood: but except in these cases, let their heads mostly shoot in their own way, according to their different modes of growth, in which they will appear always the most agreeable.

Where, however, it is required to keep shrubs low, in any particular compartment, you must regulate this as you shall see convenient, with your pruning-knife, preferably to garden-shears, which should never be used in that business to shrubs and trees in rural growth: in all of which, knife Pruning is the most eligible.

Pruning Implements.

For the purpose of general Pruning, several implements are necessary, such as Pruning-knives, saws, chisels, hand-bills, hatchets, &c.

As to Pruning-knives, two or three different sizes are requisite, in order to enable us to prune neatly; a strong one for cutting out larger branches, shoots, &c. and a small one for the more exact Pruning among the smaller branches and shoots of peach and nectarine trees, &c. these knives are generally made curving at the point; they should not be too long, broad, and clumsy, but have rather a shortish narrow blade, and but very moderately hooked at the point, for when too crooked they are apt to hang in the wood, and not cut clean; it is also proper to be furnished with a strong thick-backed knife, to use by way of a chisel occasionally, in cutting out any hard stubborn stumps, &c. placing the edge on the wood, and with your nailing hammer strike the back of it, and it will readily cut through even and smooth.

Pruning hand-saws are proper for cutting out any large branch too thick and stubborn for the knife; they should be of moderate sizes, one of which should be quite small and narrow, in order to introduce it occasionally between the forks of the branches, to cut to exactness.

As saws generally leave the cut rough, it is proper to smooth it with a knife or a pruning-chisel.

Pruning chisels are necessary to use occasionally, both to cut off any thick hard branch and large hard knotty part, or stump, and to smooth cuts in large branches, &c. after a saw; they should be flat, and from about one to two inches abroad; sometimes large strong chisels, fixed on a long pole, are used in Pruning or lopping branches from the stems of high standard forest trees, one man holding the chisel against the branch, while another, with a large mallet or beetle, strikes the end of the pole.

A hand-bill and hatchet are also necessary to use occasionally among larger kinds of the standard trees.

All these Pruning tools, in their proper different sizes, may be had at all the cutlery shops and ironmongers, also of many of the nursery and seedsmen.

PRUNUS, Plum-tree; comprising also the Cherry-tree, Apricot, Laurel, &c.

This noted genus comprehends different sorts of valuable fruit-trees, some flowering shrubs, and beautiful ever-greens; and to some it may seem irregular to see the Cherry-tree, Apricot, Laurel, &c. arranged as species of the same genus as the Plum-tree, as being formerly considered each as a distinct genus; but late discoveries in botany prove them to be all species of *Prunus*, and modern botanists range them accordingly; all the species of which are of hardy growth, garnished with simple spear-shaped and oval leaves, and pentapetalous icosandrious flowers, succeeded by drupaceous fruit.

Class and order, *Icosandria Monogynia*.

Characters.] CALYX is monophyllous, bell-shaped, five-parted, and deciduous. COROLLA, five large, roundish, spreading petals. STAMINA, twenty or more filaments inserted into the calyx, and short didymous antheræ. PISTILLUM, a roundish germen, slender style, and orbicular stigma. PERICARPUM, a roundish drupaceous fruit, inclosing a roundish, compressed, hard nut.

The principal species of this genus are—common cultivated Plum-tree, having numerous varieties: Bullace-tree—Sloe-tree, or Black thorn—Cherry-tree, having many varieties—Padus, or Bird Cherry—Apricot-tree, many varieties—and Laurel-tree: observing, that, although all of the same genus, several of the sorts differ materially from one another: we therefore think it eligible to range or class them according to their nature

or kinds, under the following heads—Plum kinds—Cherry kinds—Apricot kinds—Laurel kinds, &c. all however under the generical name *Prunus*.

Plum Kinds.

Under this head we may comprise three species, viz.—1. Cultivated Plum-tree, and its numerous varieties.—2. Bullace-tree.—3. Sloe-tree.

1. *PRUNUS domestica*.

Domestic Prunus, or common cultivated Plum-tree.] Grows fifteen to twenty feet high, or more, garnished with oval-spear-shaped leaves, and with the pedunculi for the most part singly, terminated by white flowers, succeeded by Plums, of many different shapes, sizes, colours, and properties in the varieties.

Varieties.] The varieties of the domestic *Prunus* are very numerous, especially of the fruit; all the different sorts being varieties of this species, though the trees of the different varieties often differ somewhat in their growth, some being strong shooters, others moderate, and frequently vary in the size and colour of their shoots and leaves; those bearing large fruit have generally larger leaves in proportion; and the difference in shape, size, &c. of the fruit is also very considerable in different varieties, some being round, others oval, and some being not much larger than Cherries, others as large as eggs; and some are yellow, others black, blue, red, and some green, &c. all of which varieties ripen perfectly in our gardens and orchards.

Principal varieties of the fruit are,

White Primordium, or Jean Hative Plum.—A smallish, oblong, yellow Plum, powdered with a white bloom, esteemed chiefly for its early perfection; ripe the middle or end of July.

Morocco, or early black Damask Plum.—A middle-sized, round, blackish-purple fruit, powdered with blue, is well flavoured, and discharges the stone; ripe end of July.

Little Damask Plum.—A small, round, black, well-flavoured Plum; ripe end of July or beginning of August.

Great Damask Violet Plum.—A moderately large, roundish-oval, dark-blue Plum, covered with a violet bloom, is of a rich juicy flavour, and quits the stone; ripe in August.

Précocé de Tours.—A roundish, dark-purple, fine, early Plum.

Queen Claude Plum, sometimes called Green Gage.—A middle-sized, round, yellowish-green Plum, having a firm, deep-green pulp, of a fine rich flavour, and quits the stone; ripe in September.

Little Queen Claude Plum.—A small, round,

whitish-yellow Plum, powdered with white, and parts from the stone; ripe end of August and beginning of September.

Green Gage Plum.—A middle-sized, roundish, green Plum, sometimes purplish on the sunny side, having a yellowish-green firm pulp, of a most delicious rich flavour, but does not discharge the stone freely; is one of our most valuable Plums, and the tree a great bearer; ripe the end of August and beginning of September.

Varieties.] There are several varieties of greenish Plums, that go by the name of Green Gages, that are of inferior quality.

Blue Gage Plum.—A middle sized, roundish, bluish Plum, of a rich flavour; ripe beginning or middle of September.

Orleans Plum.—A middle-sized, round, pale-red Plum, often of a whitish-green colour on the side away from the sun; is of but a middling flavour, and quits the stone clean. The tree is of spreading growth, a remarkably great bearer, and very profitable for common use, and for those who supply the markets; ripe end of August and beginning of September.

Drap d'Or, or Cloth of Gold Plum.—A middle-sized, roundish, bright-yellow Plum, spotted with red, of an excellent vinous flavour, and adheres to the stone; ripe beginning or middle of September.

Black Perdrigon Plum.—A middle-sized, oval, dark-coloured Plum, powdered with a violet bloom; is of a fine rich flavour; ripe middle or end of August.

Blue Perdrigon Plum.—A large, roundish, bluish-coloured Plum, replete with a delicious juice; ripe end of August.

White Perdrigon Plum.—A middle-sized, roundish-oblong, whitish-yellow fruit, covered with a white bloom; is firm, juicy, rich, and quits the stone; ripe end of August and beginning of September.

Roche Courbon, or Red Diaper Plum.—A middle-sized, round, fine-red Plum, powdered with a violet bloom, is high flavoured, and adheres to the stone; ripe end of August.

Red Imperial Plum.—A large, oblong-oval, flattish, pale-red Plum, covered with a whitish bloom; is of but a middling relish, and parts from the stone; ripe middle of September.

White Bonum Magnum, Mogul or Egg Plum.—A remarkably large, oblong-egg-shaped, whitish-yellow Plum, powdered with a white bloom, having a fine pulp that cleaves to the stone; more esteemed for culinary use, than eating raw; the tree shoots strong, with

very

very large leaves; is a great bearer, and the fruit is the largest of the Plum kind; ripe beginning or middle of September.

Red Bonum Magnum, sometimes called the *Great Imperial Plum*.—A very large, oval-oblong, deep-red Plum; not of a rich flavour, but is excellent for preserving and culinary purposes; ripe beginning or middle of September.

Fotheringham Plum.—A large, oblong, fine-red Plum, having a fine rich pulp that quits the stone; ripe end of August and beginning of September.

Myraban Plum.—A middle-sized, black-purple, very fine plum; ripe in August and September.

Brignole Plum.—A largish, oval, yellowish Plum, tinged with red next the sun, having a firm, dry, rich pulp, is in much estimation for sweetmeats; ripe in September.

Le Royal Plum.—A large, roundish, light-red, finely-powdered Plum, having a juicy sugary pulp, that cleaves to the stone; ripe end of August and September.

Cheston Plum.—A middle-sized, oval, blackish-blue Plum, powdered with a violet bloom; ripe towards the middle of September.

Wentworth Plum.—A large, oval, yellowish Plum, of an acid relish, and separates from the stone; is a good culinary fruit; ripe in September.

Mirabelle Plum.—A small, round, greenish-yellow Plum, having a rich pulp, that discharges the stone, and the tree a great bearer; ripe end of August.

Apricot Plum.—A large, round, yellowish Plum, having a firm, dry, sweet pulp, that separates from the stone; ripe beginning or middle of September.

St. Catharine Plum.—A large, oblong-oval, yellowish-amber-coloured Plum, powdered with a white bloom, having a rich juicy agreeable pulp, adhering close to the stone; ripe end of September.

Imperatrice Plum.—A smallish-middle-sized, roundish, dark-bluish-purple, finely-powdered Plum, of an agreeable flavour, the pulp adhering to the stone; ripe in the beginning of October.

Little Green Damask Plum.—A small, round, greenish Plum, powdered with a whitish bloom, having a green very agreeable pulp, adhering to the stone; ripe middle or end of September.

Pear Plum.—A moderate-sized, oval, whitish-yellow Plum, of an inferior flavour, esteemed principally for preserving; ripe late in September.

Muscat Plum.—A smallish, oblong, flat,

dark-red Plum, of but an indifferent relish; ripe in September.

Damascene Plum or Damson.—A small, roundish, dark-blue Plum, of a tolerably agreeable acid relish, both for eating and culinary purposes, and the tree a great bearer; ripe in September.

St. Julian Plum.—A small, round, dark-violet-coloured fruit, covered with a mealy-powder; has but little relish; ripe end of September.

Cherry Plum.—A very small, round, cherry-shaped, red Plum, valued chiefly as a curiosity; and the tree is often planted among flowering shrubs, for the sake of its beautiful bloom in spring; and its cherry-like fruit exhibit a pretty variety in summer; though by its flowering very early, the bloom is often cut off, and seldom succeeded by much fruit.

Thus far is principally all the most noted varieties of this fruit cultivated in the English gardens, and in the nurseries for sale; though there are numerous other varieties, particularly of the common sort, growing in the orchards and hedges of farmers, &c. in different parts of the country; all the sorts being varieties of one species, first obtained from seed; and the approved sorts of them have been multiplied and continued by budding and grafting. See their *Propagation*.

But besides the above varieties of the fruit, there are also the following for ornamental plantations.

Double-blossomed Plum-tree—Gold-striped-leaved—Silver striped-leaved—and the stoneless Plum.

The two following species, *Bullace-tree* and *Sloe-bush*, grow wild in hedges, but are sometimes cultivated both for variety and use.

2. PRUNUS infinita.

Wild Plum, or Bullace tree.] Grows twelve or fifteen feet high, the branches somewhat spinous; oval leaves, hairy underneath, and the pedunculi by pairs, terminated by white flowers, succeeded by small, round Plum-like fruit, of different colours in the different varieties.

Varieties are,] Common black-fruited—White-fruited—Red-fruited; all of which ripen late in autumn. They are very acid, though of a tolerably agreeable flavour, and by many esteemed very wholesome, if eaten when quite ripe. They grow wild in the hedges in many parts of England, &c. in great abundance, so are not often cultivated; a few plants however merit culture for variety, also some in the shrubbery and wilderness compartments, where they will effect an

an agreeable diversity in autumn when in fruit.

3. PRUNUS spinosa.

Thorny Prunus, Black-thorn, or Sloe-tree.

Grows ten or twelve feet high, very branchy and bushy quite from the bottom, armed with strong sharp spines, small, spear-shaped, smooth leaves; pedunculi growing singly, terminated by flowers, succeeded by small, round, black, berry-like fruit, the smallest of the Plum kind; ripe late in autumn. It grows wild every where in hedges and woods, and is very proper to plant for field hedges, being of very quick close growth. See HEDGES.

The above three species are all that are proper to arrange under this head, considered as of the Plum kind, in respect to the growth of the trees, and nature of the fruit; though the first species only, and its varieties, are proper for general culture.

The trees of all the sorts are of the deciduous tribe, of hardy growth, and prosper in any common soil and exposure; they all flower or blossom profusely in the spring, April, and beginning of May, and make a fine appearance; all the flowers of every sort consist each of five small petals, and twenty or more stamina, the flowers and fruit being produced on short spurs arising from the sides and ends of the branches; and the fruit ripens in autumn, gradually in different sorts from the middle of July until October; exhibiting a most delightful variety in the different colours, shapes, and sizes, of the cultivated Plum kinds in particular, as well as afford a most useful supply for family use, both as excellent table fruit, and for various culinary purposes, and for preserving, &c.

With respect to the merit of the different species, &c. the first sort, *Cultivated Plum-tree* and varieties, every one knows its value as a fruit tree, and no good garden should be without a collection of the best sorts; and as to the ornamental varieties, double-blossom kind and striped-leaved sorts, as also the *Cherry Plum*, they are proper for decorating the shrubbery; but the second and third species, *Bullace-tree* and *Sloe-bush*, they are only sometimes admitted in gardens, orchards, shrubbery, &c. for variety, particularly the former, the fruit of which cause an agreeable diversity whilst growing, and afford variety at table, when all the more rich stone-fruits are gone: as to the *Sloe-tree*, however, its principal merit is to plant for forming field hedges, as before observed; it grows thick and thorny from the very bottom, and makes a strong close hedge.

The common *Plum-tree* and its varieties may be trained both as dwarfs for walls and espa-

liers, &c. and standards and half standards.

Those, however, trained against walls and espaliers, generally produce the largest and fairest fruit; so should always train some of the best sorts in both these ways, and may have any of the varieties as standards in the garden or orchard.

Propagation of all the above Species and Varieties.

First, the common Plum tree.—As to the method of raising Plum trees, all the varieties were first obtained by seed, *i. e.* from the stones of the fruit; and the approved kinds, so acquired, were afterwards multiplied by grafting and budding; for they do not continue the same sorts from seed, as from the seed of one tree there may rise many different sorts, and probably not one like the mother-tree, or very few that produce fruit worth eating; but being in possession of any approved sorts, they may be multiplied at pleasure, by ingrafting shoots or buds of them into any kind of Plum-stocks.

The general propagation therefore of Plum-trees is, by grafting and budding, and may also be increased occasionally by layers; but the two former are the most eligible methods of propagation.

By Grafting and Budding.—This is performed upon stocks of any sorts of the Plum-kind raised from the stones, sown in autumn in beds of good earth, about two inches deep; and when the plants are a year old, they being planted out in nursery rows two feet and a half asunder, and having from one to two or three years' growth, will be in a fit order to graft or bud with the desired sorts; which is performed in the usual way, either low in the stock for dwarfs, and at several feet height for standards (See GRAFTING and INOCULATION): observing, that when the first shoots from the graft or bud are one year old, those of the trees designed as dwarfs for walls, &c. should be headed down within five or six inches of the bottom, more particularly of the budded trees, in order to force out laterals from the lower eyes, so as to furnish a proper set of branches, proceeding regularly from the bottom of the tree, to cover every part of the wall and espalier. But as to standards, their first shoots may either be suffered to run and branch in their own way, or headed to a few eyes, if it shall seem necessary, to force out lower laterals to give the head a more regular spreading formation; afterwards, let them all take their own growth.

When the trees thus raised by grafting or budding are from one to two or three years old, they are of a proper size for final transplanting

planting into the garden, &c. though trees of six or eight years old may be safely transplanted; remarking however, the younger they are planted where they are to remain, the sooner and more firmly they will establish themselves, and form for bearing.

By Layers.—This is only practised occasionally; performed any time from November till March, chusing the last summer's shoots, and lay them by slit-laying; in one year they will be rooted; they must then be separated, and planted in nursery-rows, and trained either for dwarfs or standards, as may be required.

The double-blossom Plum, the two striped varieties, and stoneless kind, are all propagated by budding or grafting upon any kinds of Plum-stocks, either for dwarfs, or half or full standards.

And the Bullace-tree, and Sloe-bush or Black-thorn, are propagated by sowing the berries or stones an inch deep in a bed of common earth in autumn; and the Sloe-tree also abundantly by suckers from the root.

Observe however, that to continue the different varieties of the Bullace tree distinct, they must be propagated by budding, grafting, or laying.

Planting them in the Garden, &c. and general Culture.

The season for planting all the sorts of Plum-trees is any time in open weather, from the fall of the leaf in November until March.

The trees of all the varieties will succeed in any common soil of a garden or orchard, and in any open exposure; allot however some of the best sorts for walls and espaliers, observing those for walls should generally have an east or west aspect, or even a south wall for some of the choicest sorts; and some may also be planted against a north wall, to furnish some late fruit: and those for espaliers may be planted around any of the open quarters, as may also the standards.

First, of planting and managing the trees designed for walls and espaliers.

Plant the wall and espalier trees fifteen or eighteen feet distance; though if the walls, &c. are rather low, eighteen or twenty feet distance will be requisite, in order that in default of a proper height of walling, there may be more scope to train the branches horizontally.

Observe, if the trees thus planted are quite young, being only of one year's shoot from the grafting or budding, they should in March be headed down, as before observed, to four or five eyes, to force out lower horizontals in the ensuing summer, which, according as

they advance in length, train in horizontally at full length all summer, unless you would forward a farther supply of lower branches as fast as possible; in which case, you may pinch the young shoots in May down to a few eyes; each will throw out several laterals the same year, which train also horizontally at full length during the summer's growth; and in winter pruning, cut out only any foreright and back shoots, and train in all the regular ones at full length; for the branches of these trees must not be shortened, only occasionally to procure wood to fill vacancies, because the branches always form fruit-spurs first towards their extreme parts, which would be destroyed by shortening; so that after having shortened the first and second year's shoots occasionally, as above, and thereby procured a proper set of lower horizontals, to give the head its first form; let the whole then be trained in entire about four, five, or six inches asunder; and, according as the trees shoot, every summer train in a necessary supply of the regular shoots to fill the wall, &c. at the same time retrench superfluities, and irregular and very rank luxuriant growths, and train the supply of regular wood still at full length at the above distances; and thus the trees will soon cover a large space, and the same branches, not shortened, will continue bearing many years. See PRUNING.

For all the sorts of Plums bear principally upon spurs, half an inch or an inch long, arising from the sides of the branches, of from one or two to many years old, when trained always at full length; but if shortened, they would throw out a multiplicity of useless wood, and hardly any fruit-spurs; therefore shorten none, except some occasional shoots to fill any casual vacancy, and always train the general branches at full length, both in the summer and winter pruning.

Observe all the sorts of wall and espalier Plum-trees should be pruned twice every year, a summer and a winter pruning, in order to retrench superfluities of each year, and all foreright and other irregular shoots, and bad wood, and to train in a necessary portion of young wood where wanted to fill vacancies or to supply the place of decayed, worn-out, and other bad branches, that may casually occur; observing the general directions for summer and winter pruning, under the article PRUNING.

Standard Plum-trees may be trained both as full standards and half-standards, budding or grafting the former six feet high, and the latter only three or four; or both kinds may be

be worked low in the stock, and the first shoot trained to those heights for a stem; then let them branch away and form a head.

These standards may be planted both in the garden and orchard, at from about twenty to thirty feet distance; which having had their head previously shortened in the nursery when one year old from budding, &c. if thought necessary, in order to force out lower branches to give the head a spreading form, they should now be planted with their heads entire, all but retrenching any irregularity, and should afterwards be permitted to take their natural mode of growth, except just reforming occasionally any cross-placed or very crowded branches, and all dead wood.

Cherry kinds.

PRUNUS Cerasus, or Cherry-tree.

The Cherry was formerly placed as a distinct genus (*Cerasus*); but its *characters* proving the same as the Plum, and as both sorts readily take by budding or grafting upon one another, it is now retained as a species of *Prunus*. There is but one species of the cultivated Cherry, but which, like the Plum, sports exceedingly in variety; there are, however, several species of the Cherry kind, as Common Cherry-tree—Wild Cherry-tree—Bird Cherry, &c. the first of which and its varieties is the principal species for general culture for the fruit; likewise some of the Wild Cherry; all the others are for the shrubbery and other ornamental plantations.

The species are,

I. PRUNUS Cerasus.

(*Cerasus*)—or *Common Cherry-tree*.] Grows twenty feet high, or more, garnished with oval-lanceolate, smooth leaves, almost sessile, umbellate clusters of flowers, succeeded by large roundish red fruit of different sizes and properties in the varieties.

Varieties of the fruit.] The above species comprehends many varieties of the fruit, the most material of which are the following.

Common Red Kentish Cherry.—The tree forms a spreading head, with numerous slender branches, bearing round bright-red Cherries, of a sharp acid relish, unless permitted to hang till dead ripe, when they become of a dark-red colour, and of a high flavour; is a remarkably great bearer, and proper to cultivate where large quantities of the fruit are required for sale, is also profitable for private use, and if full ripe, is an excellent Cherry; ripe in July.

This variety is supposed to be the original kind, and that most of the other sorts were first raised from it.

Little May Cherry.—The tree a moderate

shooter, having slender shoots and small leaves, and small, round, red fruit, valued chiefly for its early perfection; ripe, end of May or beginning of June.

Common May-Duke Cherry.—The tree large, spreading, and a great bearer, having large, round, dark-red, very fine eating Cherries; ripe sometimes in the end of May, but mostly in June.

Arch-Duke Cherry.—The tree large, branching strong and erectly, having larger, round, dark-red fruit; ripe, end of June and in July.

White-Heart Cherry.—The tree is of very large spreading growth, producing heart-shaped, whitish fruit, tinged with red next the sun; ripe in June and July.

Red-Heart Cherry.—A larger, heart-shaped, red-coloured, excellent Cherry; ripe, June and July.

Black-Heart Cherry.—A large, heart-shaped, very dark-red, rich-flavoured Cherry; ripe, end of June and in July.

Amber-Heart Cherry.—A middling-sized, heart shaped, amber-coloured fruit; ripe, middle or end of July.

Ox-Heart Cherry.—A very large, heart-shaped, red Cherry; ripe, middle or end of July.

Bleeding-Heart Cherry.—A large, longish, heart-shaped, deep-red, beautiful Cherry, but the tree no great bearer; ripe, middle or end of July.

Hertfordshire late Heart Cherry.—A middle-sized, heart-shaped, firm, good Cherry; ripe, end of July and beginning of August.

Carnation-coloured Cherry.—A very large, roundish, white and red, beautiful, firm Cherry; ripe, end of July, and in August.

Lukeward Cherry.—A middle-sized, roundish, dark-coloured, very good Cherry; ripe, end of July.

Morello Cherry.—The tree a moderate shooter, but spreading, with numerous slender branches, and a great bearer, producing large, round, dark-red fruit, having a tender juicy pulp, of a sharp acid taste; but if properly ripened in a sunny exposure, is of a rich agreeable relish. The trees being generally planted against a north wall, never ripen the fruit perfectly till late in the season; but some should also be planted on a south wall, to have the full sun, where the fruit will ripen three weeks sooner, and attain a much richer flavour, and prove an excellent Cherry for the table; ripe in August and September.

Black Coroun, or Courone Cherry.—The tree of middling growth, and a great bearer, producing middle-sized, round, black, very

juicy, excellent Cherries, of an agreeable bitterish flavour; ripe, end of July and in August.

Bigaron Heart Cherry.—A largish fine Cherry; ripe, July and August.

Crown Heart Cherry.—Large, roundish-heart-shaped Cherry; ripe in August.

Tradescant's Cherry.—A largish fine Cherry; ripe in August.

Turkey Heart Cherry.—A large, roundish-heart-formed Cherry; ripe, July and August.

Holman's Duke Cherry.—A large, round, good Cherry; ripe, June and July.

Yellow Spanish Cherry.—A large, yellowish, firm fruit; ripe in July and August.

White Swiss Cherry.—A large, whitish, juicy Cherry; ripe, July and August.

These are all the principal varieties of Cherries proper for general culture, and trees of all the sorts are sold at the public nurseries by the above names, annexed to each variety, all of which are deciduous, and of hardy growth, will succeed in any common soil and situation, and bear well both in dwarfs for walls and espaliers, and in standards of all sorts. See their *Culture*.

Varieties of the trees.] Cultivated principally for ornament and variety in shrubbery plantations.

Double-blossomed Cherry.—The tree is of a moderate growth, and produces large, very double, pure-white flowers, of great beauty, placed on long slender foot-stalks; each flower being as double as any rose, rising in great abundance all over the tree, and make a fine ornamental appearance in the shrubbery and other compartments of the pleasure-ground; flowering in May, but rarely any fruit, except sometimes from some semi-double flowers.

Red-blossomed Cherry.—Having pale-red flowers.

Weeping or Pendulous Cherry.—A tree of very moderate growth, with slender, pendulous or drooping branches, hanging downward like the weeping-willow, producing small fruit.

Dwarf Cherry tree.—A tree of low slender growth.

2. PRUNUS avium.

Great Wild Cherry-tree.] Grows forty or fifty feet high, having oval-spear-shaped leaves, downy underneath, and umbellate sessile clusters of white flowers, succeeded by small round fruit, of different properties in the varieties, and all of a peculiar bitterish flavour.

Varieties are,] Common, small, black wild Cherry—Red wild Cherry—Larger fruited wild Cherry; ripe, end of July and in August.

The trees of the first two varieties of this species are of a large lofty growth; and grow wild in England, &c. in woods and hedges, but are proper to cultivate both as fruit, forest, and ornamental trees, and are often planted in gardens, avenues, lawns, and parks, as they make a fine appearance in spring when in blossom, and bear great crops of fruit, which succeeds the varieties of the cultivated Cherry, and though small, is of an agreeable flavour, and considered as timber-trees, they are greatly esteemed by the cabinet-makers, turners, and some other trades, the timber being of a fine reddish colour.

The following are the Bird Cherry kinds, cultivated chiefly for ornament, the fruit being not good to eat; but being greatly coveted by the birds, have the appellation of Bird Cherry.

3. PRUNUS Padus.

(Padus)—or *common Bird Cherry.*] Grows fifteen or twenty feet high, of a shrub-like growth, and with a spreading head, large, oblong, rough, serrated leaves, having two glands at the back of their base, and long loose clusters of white flowers, succeeded by small, round, black fruit in August.

Variety.] *Cornish cluster Bird Cherry,* having generally a taller upright stem, a more compact regular head, broader leaves, distinguished however with two glands at the back of the base, like the other; and with shorter, more compact clusters of flowers, succeeded by larger red fruit.

The common sort grows wild in hedges in the northern parts of England.

4. PRUNUS virginiana.

Virginian Bird Cherry.] Grows thirty feet high, dividing into a very branchy head, having a dark-purple bark, oval, slightly serrated, shining-green leaves, having two glands at the fore part of the base, and long clusters of white flowers, succeeded by small, round, berry-like, black fruit.

5. PRUNUS canadensis.

Canada Dwarf Bird Cherry.] Grows but four or five feet high, branching horizontally near the ground, and has smooth branches, broad, spear-shaped, rough, downy leaves, without glands, and long clusters of white flowers, succeeded by small, round, berry-like, black fruit; ripe in autumn.

6. PRUNUS Mahaleb.

(Mahaleb)—or *Perfumed Cherry.*] Grows ten or fifteen feet high, having smooth whitish branches, small, oval, shining-green leaves, and corymbose clusters of white flowers, succeeded by small fruit.

7. PRUNUS caroliniana.

Carolina ever-green Bird Cherry.] Grows four

four or five feet high, branching from the ground, garnished with ever-green, oblong, spear-shaped, serrated leaves, without glands; and clusters of flowers, in a racemus, succeeded by small fruit.

All the above seven species of the Cherry kind, arranged under this head, flower commonly in April and May, so abundantly as in a manner to cover the branches; each flower having five small petals, and twenty or more stamina, as observed of the plums, succeeded by fruit all of the Cherry kind, ripening in different sorts from May until September; remarking however, that the fruit of two species only are esculent, *i. e.* *Common Cherry-tree* and its varieties, and the *Great Wild Cherry*; those of the other species being of a disagreeable relish.

All the varieties, however, of the common Cherry-tree and great Wild Cherry merit culture for their fruit; and as Cherries in general are valuable as a most refreshing fruit in the heat of summer, and for their attaining the earliest perfection of mature ripeness, of any of our tree fruits, every good garden should be furnished with a collection of the trees of different sorts, but principally of the common Cherry and varieties.

But the double-blossom kind, &c. and all the sorts of Bird Cherry and the Perfumed Cherry, are employed principally in shrubberies for ornament and variety.

The common Cherry, in all its varieties, is cultivated both in gardens for walls, espaliers, and standards, and in orchards, both in assemblage with other standard fruit-trees; and in many places whole orchards of them, in full standards, are planted, in order to supply the markets with the fruit. In gardens, however, it is proper to have a portion both as dwarfs for walls and espaliers, and half and full standards; and if some of the best kinds are planted against walls of different aspects, they will furnish a succession of ripe Cherries from May, or beginning of June, until September, besides the supply from the espaliers and standards; for the trees will bear in all exposures; but it is highly proper to have some of the earliest and other more valuable kinds against a south or south-east wall; those in the south exposures will ripen soonest, and will be succeeded regularly by the others in the east, west, and north aspects; a north wall however is very commonly allotted for the Morello Cherry in particular; but as this is a most excellent Cherry when well ripened, it is eligible to allow a share of the trees a south aspect, where they will ripen sooner

and in greater perfection; and those planted against a north wall will succeed them, and continue until September. However, where there is scope of ground, and different situations, it is advisable to plant several different sorts accordingly, both some superior sorts for walls, of early, middle, and late kinds; and always a more considerable portion of standard trees in proper collection of the best varieties, planted in gardens and orchards, to furnish the principal production of fruit, both in private gardens, &c. for the general domestic supply, and in larger plantations in places where the fruit is designed for the markets; whereby, in the different orders of training and planting the several varieties, a constant supply of ripe Cherries may be obtained for three or four months.

Considerable orchards of these trees are planted in some parts, particularly in Kent, for the supply of the London markets, consisting principally of the Kentish and Duke Cherries, black and white hearts, &c. and the black Coroun, as being the most certain, best, plentiful bearers; but where there is proper scope of ground, it would be of beneficial advantage to plant a good collection in standards, of all the principal varieties, both for private and public supply; regulating the quantity of trees accordingly; as cherries are mostly a profitable production, being in general estimation, both as a desirable table fruit, and for many other family occasions, during their season.

The Great Wild Cherry-tree is always trained for full standards, and planted in any open situation in orchards, parks, avenues, and hedge-rows of fields, &c. in which latter it is abundant in many places, and is particularly so in some of the counties round London, for their great production of fruit, to supply the markets of that metropolis in August, after the consumption of the other larger kinds.

The mode of bearing of all the varieties of these trees is both on the year-old wood, and that of many years, principally upon short spurs arising from the sides of the branches, if not shortened; but if shortened, they throw out wood-shoots, and but few fruit-buds; therefore the branches of these trees must not generally be stopped, but suffered always to remain at full length, where room for their extension.

All the sorts of these trees will prosper in any common soil, capable of producing good crops of esculent herbs and roots, grass and corn, &c.

Method of Propagation and General Culture.

The method of propagation for all the varieties of the Common Cherry-tree is by grafting and budding them upon stocks of any of the cherry kind, raised from the stones of the fruit,

of any or all sorts promiscuously; but for having larger-growing trees, both for standards, walls, and espaliers, the most general stocks used on that occasion are the Wild Black and Red Cherry, raised from the stones of the fruit: they will, however, grow upon any sort of Cherry-stock; and they will likewise take upon Plums, though plum-stocks are not advised for general use; they will also grow upon laurel-stocks; which, however, is only sometimes practised for curiosity, suffering a small part of the stock to grow up to show the singularity of the two sorts growing upon the same root. All the varieties will likewise grow upon the Bird-Cherry; but this should only be practised when required to dwarf any trees as much as possible; which being grafted on the common or Canada Bird-Cherry, are proper to train for small dwarf trees, either to plant occasionally in pots, or some in the open borders, and in pots for forcing, or to plant in the borders of a forcing-frame. (See FORCING FRAMES.) However, for general use, always use stocks either of any of the common cherry varieties; or, to have larger trees, as before intimated, may use principally the Wild Cherry-stocks, as being the freest shooters and of longest duration; though, in default of these, may use any sort of common Cherry-stocks.—And as to the method of raising the stocks in general, it is from the stones of the fruit, sown in autumn in beds of light earth, covering them near two inches deep; they will come up in the spring; and in autumn or spring following, if the plants are strong, transplant them in nursery-rows two feet and half asunder, to remain for grafting, &c. which, when about the size of a large goose-quill to that of a person's little finger, or but little more, they will be fit to work for dwarf trees; but for standards, they must have at least four years' growth, because they must be grafted at five or six feet height.

Or to have trees of more moderate growth either for walls, small standards, or dwarfs, the Morello and small May Cherry stocks are proper; but to obtain these stocks more certainly of their peculiar moderate growth, it would be proper to raise them from layers, as the seedling stocks are apt to vary to others of strong growth; or also for smaller trees, may occasionally use the Bird Cherry stock, as before observed.

The grafting and budding of all the sorts is performed in the usual way, though grafting is most to be recommended for general practice, as they are not so liable to gum in the grafted part as in that of the budded trees; though both methods are occasionally used successfully, and may be practised accordingly, as the stocks oc-

cur in proper growth, &c. and whip-grafting is the most eligible in the general part, in that method of propagation; and the budding being only one general method, is here performed accordingly in the common way; performing the grafting in the spring, February and March, and the budding in summer, June or July; observing to graft or bud the dwarfs near the ground, and the half and full standards from three to six feet high: the grafted trees will shoot the same year, and the budded ones not till the spring following.

Observe, that when the first shoots from the graft or bud are a year old, those of the dwarf trees for walls, &c. must be shortened down in March or beginning of April, to five, six, or eight inches long, according to their strength, to procure lateral shoots to form the head; but as to the standards, they may be shortened or left entire as the case requires. If you would have them form a spreading head, the first shoots may also be shortened to force out lower branches; after this, let the branches both of the dwarfs and standards remain mostly at their full length; and whilst the trees continue in the nursery, train those designed for walls, &c. to stakes, in a proper position, and occasionally pinch or prune young shoots of the year early in summer, down to a few eyes or buds, where it may seem expedient, in order to procure a production of laterals therefrom, the same season, to train in for a farther supply of young wood, to increase the expansion of branches as soon as possible, all which still continue entire.

When the trees are from one or two to five or six years old, they are proper for final transplantation into the garden and orchard; though if planted when their heads are not more than two or three years old, they will succeed much better than larger trees.

The season for planting them may be any time in open weather, from the end of October, or beginning of November, till March.

Plant the wall and espalier trees eighteen or twenty feet distance; and if the walls are tolerably high, may plant a half or a full standard in the spaces between the dwarfs, that whilst these cover the bottom and middle, the standards may cover the upper part of the wall.

The management of these trees, thus planted against walls and espaliers, is principally as follows.—First, observe, that if they were planted when only one year old from the grafting, &c. with the first shoot from the graft or bud entire, they should be pruned short in March or beginning of April, as observed in their nursery culture, to furnish lateral branches; but if they were headed in the

the nursery, and horizontals thereby obtained, they must not be shortened now nor hereafter, except occasionally in particular shoots to fill a vacancy; for as the fruit-spurs first rise towards the upper end of the branches, a general shortening would not only cut away the first fruitful parts, but force out a great deal of useless wood; let therefore the necessary branches, arising every year after the first heading down, be trained horizontally at full length, five or six inches asunder; and if wood is wanted, pinch some adjacent young shoot in May or early in June, or shorten it in the spring following, and it will push forth two or three laterals; being careful to retrench all fore-right and other irregular-placed shoots, and continue training the regular branches still at full length, at equal distances, till they have filled the allotted space of walling or espalier; thus, by arranging the branches entire, they will soon spread considerably, and emit numerous fruit-spurs all along their sides, and in two or three years bear abundance of fruit.

Observe the bearing wood does not want renewing annually; but the same branches continue bearing several years, and only want renewing with young wood occasionally, as any branch becomes barren or an ill bearer, except in the Morello Cherry in particular, which generally bears the most abundantly in the year-old young wood: a general successional supply of each year's shoots must therefore be retained for successional bearers, as hereafter explained.

The trees in general, however, of all the sorts must be pruned twice every year; a summer pruning early in the season, to retrench all evidently superfluous shoots soon after they are produced, likewise all fore-right and other ill-placed shoots, and rank wood, as soon as possible; and to pinch shoots where wood is wanted, so as there may be as little pruning as possible upon the older wood, which is apt to gum by much cutting; retaining, however, a general moderate supply of the regular-placed shoots, to chuse from in the winter pruning, training the whole at full length: and in winter pruning, examining now the general branches, old and young, both in the former-trained bearers, and the retained shoots of the preceding summer, still retaining all the fruitful and regular placed former trained branches; and if, among these, any particular irregularity, disorderly or improper growth occurs, the whole should now be reformed by proper occasional pruning accordingly, in the order required, either by reducing with your knife, more or less, any disorderly growth, to requisite regularity, or by cutting others clean out,

as it shall seem necessary, by your observations in the process of pruning; and in old trees or others, as it may happen, it is proper to retrench any casual worn-out, or declined naked branches, destitute of bearing wood, fructiferous buds, or fruitful spurs, and to cut out all decayed wood; observing, in your proceeding, to retain a plentiful succession of last summer's young wood, in proper places, where necessary, and to supply the place of any unserviceable old wood, now retrenched; and at the same time cut out all superfluous, or over-abundant, and other unnecessary shoots, reserved last summer, not now wanted, leaving only some well-placed ones, in any vacant spaces, as above intimated, or some in particular parts, to train in between the main branches, to be advancing for bearers, ready to supply any casual deficiency; and generally a terminal shoot to the general branches in all parts where the allotted space admits of extending them in proper regularity: then according as each tree is thus pruned and regulated, let the general branches and shoots be trained in regularly, and nailed to the wall, &c. about three to four or five inches asunder, all at their full length, to the extent of their limited space. — See PRUNING, under the heads, *Summer* and *Winter Pruning*.

Observe, in both seasons of pruning, in cutting out the useless wood, always to cut every thing quite close. See PRUNING.

Likewise be particularly careful to preserve the fruit-spurs, only retrenching such as become very rugged, unsightly, and barren, not furnished with blossom-buds.

Observe, in the above general pruning of wall and espalier Cherries, that, as the Morello in particular, and the small early May Cherry, bear both on the young wood of last summer, the fruit blossom buds issuing immediately from the eyes of the shoots very abundantly, and upon small natural fruit-spurs arising on the two and three years' wood and continuing on the older branches; but generally bear the most plentifully on the young wood; and therefore it is necessary both in the summer and winter pruning to retain a general supply of the young shoots of each year, trained in plentifully in all parts of the tree in summer, of the most regular placed, as many as can be conveniently admitted with some proper regularity: and in winter-pruning, making a general selection of the best well placed in said shoots of last summer, to train in for successional bearers the ensuing season, cutting out the superabundant, with part of the naked former bearers occasionally, to make room for the young supply, leaving a terminal one to each mother branch, agreeable to the foregoing

going intimations: and thus train in the general branches, and shoots horizontally, about three or four inches asunder, all at their natural length.

Standard Cherries should be planted twenty-one feet distance at least; though, if for a whole orchard, twenty-four feet, or eight yards distant every way, will be requisite. Observe that the first shoots having been previously shortened in the nursery, if thought necessary to promote lower branches to form the head, plant them now with their heads entire, except just reducing any irregular growth, and suffer them to branch every way, and shoot in length as fast as they are able, not shortening any, and all the branches will soon form numerous fruit-spurs.

Very little pruning is required for Standard Cherries, and the less the better, as too much use of the knife, in larger wood particularly, causes them to gum and canker; therefore, all that is necessary is, occasionally to retrench any very irregular-growing branch, and all decayed wood.

The Double-blossomed Cherry is also propagated by grafting or budding, like the other varieties, upon any kind of Cherry-stocks, and may be trained both as dwarfs and half and full standards, to effect the greater variety in the plantations.

The Wild Cherry-tree is easily raised from seed, i. e. the stones of the fruit; though any variety producing larger and fine fruit may be continued by grafting, &c. and will bear sooner. — To raise them, however, from the stones, procure a quantity in autumn, when the fruit is dead ripe, and sow them in beds of light earth an inch and a half deep; they will come up in the spring, and after having one or two years' growth, plant them out in nursery-rows, with their tops entire; here train them up for standards, with stems six feet high; then let them branch out above every way, to form heads.

They may be planted out as standards in gardens, orchards, or any open grounds for the fruit, and in ornamental plantations of forest trees.

All the sorts of *Bird Cherry* are also propagated plentifully by the seed or stones of the fruit, sown in the autumn in light earth, near an inch deep; the plants will rise in the spring, and in a year after should be planted out in nursery-rows, one or two feet asunder, to remain a few years till fit for the shrubbery, &c. and may also be propagated by grafting.

These sorts may also be propagated by layers, which will readily strike root, and be fit

for transplanting in one year. They will also grow by cuttings planted in autumn.

The *Perfumed Cherry* is often also propagated by grafting upon any sort of Cherry-stocks, raised as before directed in the propagation of the common Cherry-tree, and may also be tried by layers.

Of forcing Cherries for earliest Fruit.

Cherries forced by artificial heat, in forcing houses, are obtained at the earliest season, April and beginning of May.

For this purpose, the earliest Dukes and May Cherry are the proper sorts, but principally the former; trained both in standards, of four, five, or six feet stems, to elevate the heads near the top glasses of the forcing-house; the heads being generally pruned to a small compass for that purpose; and in dwarf standards, with short stems and low heads: and both of which, for this occasion, should be such as are previously trained in the full ground, till the heads are of three, four, or five years' growth, or till they have commenced bearers in some tolerable degree; and then the forcing-houses, for this occasion, having internal borders of good earth, either in the back part for the taller trees, and in the front for lower; or sometimes, where no internal bark-pit, for bark-bed heat, the forcing being effected wholly by fire, the whole bottom space is entirely formed into a compartment of earth of proper depth; and the trees are planted therein, in rows from the back to the front, in some regular gradation according to their height; sometimes with dwarfs planted between the taller standards, and towards the front; and occasionally dwarf trees in pots are introduced, both in a cherry-house, as above, and in general forcing houses, for different sorts of trees, that are occasionally forced, such as peaches, nectarines, &c.

Cherry forcing-frames, having the whole bottom space entirely of earth, in which to plant the trees, have fire flues ranged internally along the back wall and front, &c. and some having an internal bark-pit, in the middle space for bark-bed heat, as before noticed, a raised border is formed behind for the trees, and low ones next the front glasses, for smaller trees; having also flues as above; though, when having a bark-bed, the forcing is sometimes effected principally by the heat thereof, or assisted occasionally, in severe weather, by a gentle fire heat in the flues: but are also very commonly without a bark-pit, and worked entirely by fire moderately.

When the trees are planted in the full earth of the forcing-house, they should be permitted

permitted to have taken good root therein, before they are forced; if of one year's growth the better; and during which interval, should be exposed to the full air, by having all the glasses off, till near the time to begin the forcing, that the trees may be of proper strength.

The season to begin the forcing is January, or beginning of February, previously having all the glasses put on close a week or two before; then, if the forcing is by fire-heat, should make moderate fires every evening and morning, to support a constant regular, mild, internal heat; giving air in fine days, especially when the trees begin to push; and giving also occasional waterings to the borders; or where the forcing is principally by bark-bed heat, the bed should be made in proper time accordingly, that it may acquire a requisite degree of heat, by the time it is intended to commence the forcing, about the middle or latter end of January, or beginning of February.

By the above means of artificial heat in forcing-houses, the trees come into blossom very early, but generally sooner by fire heat; will be mostly in full blossom in February; and the fruit will be well set, and advancing in free growth in March, and attain full perfection of gradual ripeness in April and early in May. See FORCING-FRAMES, HOT-WALLS, BARK-BED and BARK-PIT.

Apricot, Kinds.

PRUNUS Armeniaca, Apricot-tree.

Under this head is ranged only one species, the *Armeniaca* or Apricot, a choice fruit tree, comprehending many valuable varieties of the fruit: it was formerly ranged as a distinct genus (*Armeniaca*), but is now a species of *PRUNUS*.

Class, order, and characters, the same as the Plum-tree (*Prunus domestica*).

The species is,

PRUNUS Armeniaca.

(*Armeniaca*)—or *Apricot-tree*.] Grows fifteen or twenty feet high, with a large spreading head, having reddish shoots, large, nearly heart-shaped leaves, and close-sitting, pale-red flowers, rising all along the sides of the young branches; succeeded by large roundish fruit, of a yellow and reddish colour in different varieties.

The most noted varieties of this fruit in the English gardens are,

Early White Masculine Apricot.—A small round whitish yellow fruit, ripe towards the middle or latter end of July.

Early Red Masculine Apricot.—A small round fruit, reddish next the sun, and of a juicy agreeable flavour; ripe, middle or latter end of July, and beginning of August.

Orange Apricot.—A large roundish fruit of

a deep-yellow colour, tinged with red next the sun, having a firm but rather dry pulp, is however a handsome fruit; ripe, beginning or middle of August.

Algiers Apricot.—An oval, somewhat compressed, pale-yellow fruit, is tolerably juicy and well flavoured; ripe, early part of August.

Roman Apricot.—A large, roundish, yellow fruit, firm, juicy, and well-flavoured; ripe, beginning or middle of August.

Turkey Apricot.—A very large, oval, compressed, deep-yellow fruit, having a firm, well-flavoured pulp; ripe, beginning or middle of August.

Temple Apricot.—A middle-sized, roundish, compressed, deep-yellow, firm, good fruit; ripe, middle of August.

Breda Apricot.—A large, roundish, deep-yellow fruit, having an orange-coloured pulp, is an excellent Apricot, and the tree a good bearer both against walls and in espaliers and standards; ripe, middle or end of August.

Brussels Apricot.—A moderate-sized roundish-oval fruit, spotted with red next the sun, the other side yellow, having a deep-orange-coloured, firm, high-flavoured pulp; and the tree bears well against a wall and in standards; ripe, middle and end of August.

Royal Persian Apricot.—A large, roundish, fine-flavoured fruit, yellow and reddish; ripe in August.

Transparent Apricot.—A middle-sized, roundish, clear fruit, with a firm, rich pulp; ripe in August.

Dunmore Breda Apricot.—A large, round, most excellent rich fruit; ripe, August and September.

All the varieties of these trees blossom early in the spring, about the end of February and in March, arising principally from the sides of the young shoots of the former year, immediately from the eyes or buds; also sometimes upon spurs from the two years old wood; and the flowers are succeeded by young fruit in April, increasing gradually in magnitude till July and August, when they attain perfection; observing they should be gathered before they become wholly soft ripe, otherwise they will eat mealy and with no flavour; but being gathered according as they discover mature growth, while the fruit remains moderately firm, they will then eat brisk and agreeably flavoured.

As these trees blossom and set their fruit early in spring, often whilst sharp frosts and cutting blasts prevail, frequently destroying most of the bloom and newly-set fruit, so that they sometimes have but very thin crops, for this reason they require a sheltered, warm, sunny situation in this country. In favourable seasons,

seasons, however, they sometimes produce five times more fruit than they can nourish or bring to due perfection; in which case the fruit is always thinned when about the size of ordinary cherries, or little smaller or larger; and those thinned off are excellent for tarts.

But the trees of most of the sorts require to be trained against a warm wall, in order both to protect their early blossom and young fruit from the injuries of the weather, and to promote the more early and perfect ripening of the Apricots; they will succeed in an east or west aspect. It is, however, proper to allow the early, and most of the principal large kinds, a south wall; and having them in different aspects, effects a variation in the times of ripening.

Some sorts will also bear tolerably in espaliers and standards, particularly the Breda and Brussels Apricot.

Apricots are valuable summer fruit for several different purposes. Green and young for tarts; for which purpose, being gathered before the stone becomes hard, they make the most excellent tarts or pies of any fruit so early in the season. When ripe they are very fine table fruit, provided they are gathered before they become soft and mealy. And being preserved in sugar are an excellent sweetmeat.

Method of Propagation and general Culture.

These trees are propagated by budding upon any kind of Plum-stocks.

The stocks for this purpose are raised from the stones of the fruit, sown in the autumn in beds of light earth two inches deep; they will come up next spring; and in autumn or spring following, the plants will be fit to plant out in nursery-rows; and in a year or two they will be fit to bud for dwarfs for walls, &c. but for half standards and standards they must have three, four, or five years' growth, and trained up with stems from three or four to six feet high; though sometimes the budding for standards is performed low in the stock, and the first shoot trained up for a stem.

The budding is performed in August, being careful to procure shoots from which to take the buds from trees of the best sorts, as proved by the fruit they bear; performing the work of budding them in the usual way (see INOCULATION). The buds will not shoot till following spring, at which time, before they begin to push, head down the stock a little above the insertion of the bud; soon after which, the buds will shoot and advance rapidly, and by autumn form a large shoot of a yard or more long; and the trees are then proper for planting out for good, especially the dwarfs intended for wall trees; or some may remain a year or two longer in the nur-

fery, and trained in a proper expansion for planting against walls; and others for standards; observing, that whether they remain in the nursery, or are transplanted into the garden, the above first shoot from the bud must, in March following, be headed down to four or five eyes, to procure lower horizontals, as observed of the Plums and Cherries.

When, however, those intended for wall-trees are of one year's growth, with their first shoots or head entire, they are of a very proper size for planting out finally where they are to remain. They may be planted any time in open weather from October until the beginning of March, chusing a south wall for the early and some other kinds, to come in forward; but as those exposed to the full south sun are apt to become soon mealy, it may be proper to plant a principal supply against east and west walls.

They do not require any particular soil or compost, but will succeed in any common soil of a garden; previously, if for a full plantation, trenching the border two spades deep.

Plant them in a range close along the wall, at eighteen feet distance, with their heads entire for the present, which fasten either to the wall or to stout stakes, one to each tree, to preserve them steady until spring, when they must have their first pruning, &c.

Their management, after being planted in the garden, is as follows; in the first place observing that if the trees are only one year old, with their first head from the bud entire, they must be headed down in the spring, as aforesaid, to four or five eyes, to force out branches below; after this give the trees water in dry weather, and they will readily push out shoots from all the remaining eyes, which in summer nail up regularly to the wall at their full length; and if any fore-right or back shoots come out, rub them off, being careful to continue the regular shoots to the wall all summer and the following winter; and in spring shorten each shoot to about eight, ten, or twelve inches, according to their strength, leaving the lowermost ones, on each side, rather the longest; this pruning short being still necessary in order to procure a farther supply of lower branches, that every part of the wall may be occupied quite from the bottom; having particular attention to preserve nearly an equal number of branches arranging on each side of the tree, and nail them close to the wall horizontally, four, five, or six inches asunder. The summer following, each horizontal will push out three or four, or more, new shoots, of which, if any rise fore-right and behind the branches, rub them off early in the season, and nail in all the regular side shoots, at full length,

length, all summer, except it is necessary to pinch any particular shoot early in the summer to fill a vacancy as soon as possible. In the winter pruning examine if there be any superfluities or irregular growths left in summer; cut them out close, and let all the regular-placed necessary shoots be shortened, though they should not now be pruned so short as in the two first years, only cutting each shoot according to its strength, from about eight or ten, to fifteen or eighteen inches long; for we may now suppose the head of the tree to be tolerably well formed; should therefore prune so as to obtain a farther supply of wood, and a production of fruit; remarking, that as these trees bear principally upon the wood of a year old, it is eligible to train in a general supply of young shoots, of each year, in every part; the same shoots producing, at the same time, both a crop of fruit and a supply of wood for next year's bearing; still remembering that the annual supply of wood must always be shortened in the winter pruning; for if left entire, they would produce only some shoots near the top, and leave the bottom naked, so as, in a few years, the whole tree would become very thin of bearing wood below, and bear only a little towards the extreme parts of the branches; this therefore determines that, in winter pruning, the shoots should always be more or less shortened according to the strength of the tree, situation and strength of the respective shoots, in order to obtain a necessary succession of young wood annually in proper situations, so as to continue all parts of the tree from the bottom to the extremity, every way regularly filled therewith for bearing; observe, likewise, that as these trees bear also upon short spurs, arising upon the two-years-old branches, it is proper to preserve them wherever they appear, only retrenching such as project considerably fore-right; leaving all those of one or two inches long, keeping in mind however that the young shoots, of one year's growth, are the principal bearers: those produced one year bear fruit the next, and a general supply must be every year retained, and not shortened in summer, which would force out laterals from every eye, and spoil the shoots for next year's bearing; but in winter pruning, a general shortening, more or less, is necessary, and the whole tree then regularly nailed to the wall.

Observe, they must be pruned twice every year, a summer and a winter pruning.

The summer pruning consists in reforming the irregularity of the numerous shoots annually produced in this season, beginning in May or early in June, and rub or cut off

close all fore-right and back shoots, and all evident superfluities and very rude growths; retaining, however, in every part, a full supply of the regular side-shoots, as succession-wood for the next year's bearing, training them in at full length, as before directed, to remain till the winter pruning; for it is of importance to leave doubly more, at least, than a sufficiency of the well-placed shoots at this season, to have plenty in every part to choose from in the general winter pruning. See PRUNING.

And the winter pruning comprehends a general reform among all the branches and shoots, such as the retrenching all worn-out and old naked branches ill furnished with bearing wood, as they from time to time occur, to make room for those furnished with proper young shoots of the preceding summer; at the same time selecting and retaining, in every part, the best of the said shoots for next summer's bearing, cutting out close all the superfluous or unnecessary and ill-placed shoots, and cut out also or reduce part of the former year's bearers and unfruitful old branches in every part of the tree, to make due room to train the necessary supply of young wood at proper distances; being careful, in retrenching the old wood occasionally, to prune it down either to a young shoot, or to some convenient branch it supports, which is furnished with one or more such shoots, so as every branch may also terminate in a young shoot for its leader, cutting off all the small shoots arising from the sides of the main ones, and let the general supply of young wood in every part be now shortened moderately, according to their strength, for the reasons before given. The smaller shoots cut to about eight or ten inches, the middling ones to twelve or fifteen, and the strong shoots to eighteen inches or two feet long, pruning them generally to a wood-bud, in order to obtain a shoot at the end for a leader, which will draw nourishment to the fruit. Cut out also all dead wood and cankered parts, and decayed spurs and stumps; then, as soon as one tree is pruned, let it be directly nailed, which should now be performed with great regularity, training all the branches, &c. horizontally, as straight and close to the wall as possible, at equal distances. See PRUNING.

Observe, when any of these trees are of a strong vigorous growth, they should be treated according to their nature; in such case, therefore, it is advisable to leave the shoots thicker or more abundant than in moderate shooting trees, and shorten them less in proportion, that by dividing the sap among many, and a greater extent of branches, it checks the luxuriancy

luxuriance which would take place in a smaller number.

For the more we prune the strong young wood in a luxuriant tree, or the shoots much shortened, the more vigorous will the tree shoot, and produce but very little fruit.

But the natural inclination of very vigorous trees should in some measure be indulged, by training as many branches as can be conveniently laid in, and shortening them but moderately, some very luxuriant ones hardly at all; which being practised two or three years, it will reduce them to a moderate growth and good state of bearing, when they may be treated in the common way.

But as the management of this tree, and the Peach and Nectarine, are nearly similar, in respect to pruning, &c. as they all bear on the young wood, we refer to that article, where more particulars of pruning and training these kind of trees are exhibited, which, for the general part may be applied to the Apricot-tree. See *AMYGDALUS Persica*.

Old Apricot wall-trees should be well attended to in pruning, whereby to continue them in a good fruitful state, by encouraging young wood in proper abundance; for by this care, the trees will not only more certainly produce abundant crops, but the fruit of old trees generally ripen earlier, with a peculiar richer, vinous flavour; therefore observing, that as these old trees are apt to run up naked below in the main branches, should be careful, when young wood advances in these parts, and all vacant spaces, to preserve it accordingly, pruned and trained in regularly, both as successional bearers, and to furnish future supplies of new shoots for the same occasion, so as to continue all parts of the tree, from bottom upward, regularly furnished with bearing wood.

Standard Apricots are sometimes planted, and in some favourable seasons bear plentifully, particularly the *Breda* and *Brussels Apricot*, either in half or full standards; the half standards will be more out of the power of the winds and cold air.

They should be planted in a sheltered warm situation in the full sun, that they may have the greater chance of setting a good crop of fruit, and of ripening more effectually with a rich flavour; and their culture in the order of growth is nearly the same as that of other standard fruit-trees; they require but little pruning, or only to reduce or retrench any very irregular growth, or out-growing ram- bler, or occasionally to regulate confused crowding branches, and to cut out casual decayed wood; all which is performed generally

in winter; but, except in the above occasions permit the general branches to advance mostly in their natural growth; and in favourable seasons, in spring, the trees will produce abundant crops, in good perfection.

Protecting the blossom and young fruit.—As Apricot-trees against walls blossom very early, both blossom and young fruit are very liable to injury from frost and cutting blasts; it is therefore advisable to afford occasional protection, in unfavourable seasons, to some of the forwardest and most valuable kinds, either with mats, suspended over the trees, or twigs of evergreens stuck between the branches, beginning the covering as soon as the blossom begins to expand, and continue it till the fruit are fairly set; the mats to be used on nights and bad weather, but the evergreens to remain constantly till all danger is past, observing the same methods as directed for the peach and nectarines. See *AMYGDALUS Persica*.

Thinning the fruit.—In some favourable seasons these trees set many more fruit than can attain perfection; and as they sometimes are placed very close, or often in clusters, and sitting close to the branches without any yielding footstalks as in cherries, &c. they, in their advancing growth, would both impoverish and thrust one another off; and therefore, these fruit, and peaches and nectarines, are principally the only sorts as require any material thinning; and which in wall-trees, particularly when in superabundance, should not be omitted, and the thinning is also proper occasionally in standards in some degree; generally beginning to thin them when about the size of large cherries or but little bigger, which should be done with great regularity, leaving the largest, fairest, and best situated, to grow to maturity, mostly all singly, or at least never more than two at the same eye, but most commonly single in the large kinds; as directed in thinning peaches.

Those thinned off make most excellent tarts, and should always be saved for that purpose, and for which occasion they may be thinned by degrees, both in wall-trees and standards; not, however, in the former in particular, to leave the superabundant fruit to grow large in any considerable degree, nor in great quantity, to rob the continuing crop of its proper nourishment; and for this said use, they should always be gathered before they stone or harden in the heart or middle.

Of forcing Apricots for earliest Production.

By forcing we obtain Apricots in the most early season, May, June, and July, sometimes two months before their natural production, effected by having trees of proper sorts in forcing.

forcing-houses, or hot-walls, worked by fire, or bark-bed, or sometimes both.

The trees for this purpose are commonly dwarfs, trained principally in the order of wall or espalier trees, or sometimes in small low standards: all generally trained trees in the full ground, till advanced to some tolerable degree of bearing in a moderate production; and being then planted, some in the borders of the forcing-house and hot-wall, are trained in the manner of wall-trees, generally to a light open treillis; and some also, in a forcing house, in small dwarf standards, placed forward; or occasionally some of similar growth, planted in pots, are introduced in the same situation; and in all of which, the trees being substantially well fresh-rooted in their places, are forced at the proper season by means either of fire-heat, or bark-bed, or sometimes both occasionally in forcing-houses, but in hot-walls mostly by fire-heat.

All forcing-houses and hot-walls have flues for fire-heat, and sometimes the former have a pit for a bark-bed; but where none, the whole bottom space is of good earth, as observed of the Cherry forcing-house, and the trees planted therein, generally in assemblage with peaches, nectarines, plums, &c. as the same degree of heat is applicable to the whole in the requisite temperature for forcing.

The season to begin the forcing is principally in January, or early in February: when, or rather some little time before, the glasses are shut close; and at the proper time, the fires are made in the furnace moderately every evening and morning, to heat the flues in a proper degree, to dispense a moderate regular heat, to warm the internal air to a requisite temperature, which forwards the trees accordingly to early blossoming and fruiting; they having admission of fresh air moderately in fine days, more freely when a warm sun; and sometimes watered both in the earth, and occasionally over the branches after the blossom is past, and the fruit fairly set; which hereby, in the whole, advances in forward growth, and attains early perfection, six weeks or two months, or more, before its natural season. See FORCING-FRAMES, &c.

Laurel Kinds.

PRUNUS Lauro-cerasus, or Laurel-tree.

Under this head are ranged two beautiful evergreen trees for ornamental plantations, viz. Common Laurel, and Portugal Laurel.

The species are,

1. *PRUNUS Lauro-cerasus*.

Cherry-bay, or the *Common Laurel-tree*.] Grows twenty feet high or more; very branchy almost from the bottom, making

strong green shoots; large, oblong, stiff, shining, evergreen leaves, having two glands at the back, and long clusters of small white flowers, succeeded by large roundish-oval black berries; flowering in April, and the fruit ripens in September, or beginning of October, but is not good to eat.

Varieties.] Gold-striped leaved—Silver-striped leaved.

This species and varieties are some of the most beautiful evergreens in nature; are of a fine free growth; the leaves singularly large and elegant, remaining all the year.

It is a native of the East, about the Black Sea; but is very hardy, and thrives here in any situation.

2. *PRUNUS lusitanica*.

Portugal Laurel.] Grows twelve or fifteen feet high, forming a very branchy full head, having the young branches of a reddish colour; oblong-oval, thick, dark-green, eglandulous, evergreen leaves, and loose bunches of small white flowers, succeeded by roundish black berries; flowering in June, and the fruit ripens in autumn: not eatable.

Both these species are noble evergreens; are commonly considered as shrubs, but are of the tree kind; the Common Laurel, in particular, becomes a large tree in its native soil, and the southern parts of Europe, where there are whole woods of it; both the species, however, thrive here, which, in many places are arrived to some considerable size, and are great ornaments to our shrubberies and other plantations, appearing elegantly green and beautiful the year round.

They are hardy, and rarely injured by inclement weather, except in very severe winters, which sometimes kills the young shoots and outer leaves.

They prosper in any common soil, and in any exposure; the Common Laurel, in particular, will grow almost any where, even under shady trees, or against fences.

Both the species are most excellent furniture for all ornamental plantations, in assemblage with the evergreen tribe in particular; and some disposed towards the fronts of deciduous plantations have also a most beautiful effect. Clumps and plantations of the Common Laurel in lawns, parks, or any out grounds, are also very beautiful; and as it prospers in almost any situation, and being a fast grower, may be employed to conceal any disagreeable fence or other unsightly object; in all which ways they will appear most beautiful, at all seasons, with their noble, large, evergreen foliage.

Hedges are sometimes formed of this tree

for ornament; but where this is practised, the hedge should not be trimmed with garden-shears, which would mangle and spoil the beauty of their large leaves; therefore all necessary cutting should be performed with a knife, in order to preserve the leaves entire, and thus the hedge will make a very fine appearance.

The common Laurel is also sometimes trained with a single clean stem, to form tall standards; and in which order of growth, are proper both to introduce in decorating plantations, in assemblage with other ornamental tree kinds, and in forest-tree plantations, either in assemblage with others of the ever-green tribe, or some separately in distinct compartments.

It has been hinted by some that the leaves and fruit of these trees are of a noxious quality: but so far from being poisonous, the leaves of the common Laurel are often used in the kitchen to put into custards, &c. which gives them a most agreeable bitterish flavour; and the berries are often put into brandy; though strong distillations thereof, improperly administered, have proved hurtful.

The season for planting these trees may be any time in open weather, from the latter end of September or beginning of October, till March, or beginning or middle of April, though October and beginning of November is the most successful season, or also in any of the spring months, in open mild weather.

Method of Propagation.

The propagation of these beautiful trees is very easy, by seed and cuttings: but as cuttings are the most expeditious mode of propagation, they are most commonly raised by that method.

By Seed.—In autumn, when the seeds or berries are ripe, sow them in beds of light earth, near an inch deep, and allow them some protection in severe frosts in winter, either by hooping and matting the bed, or covering it with any dry long litter; but let them remain uncovered all mild weather; with this care the plants will come up in the spring, giving occasional waterings in dry weather; and in the autumn or spring following, when the season is settled, plant them out in nursery-rows to remain two or three years, or till wanted for any plantation.

By Cuttings.—This is a sure and very expeditious method of raising these evergreens; the young shoots strike freely, and soon commence proper plants. In August or September, in moist weather, procure a quantity of cuttings of the same year's shoots, cutting them off from about eight or ten, to twelve or fifteen

inches long, with about an inch of the old wood to the bottom of each cutting if possible, though this is not indispensably necessary: having procured the cuttings, strip off the leaves from the lower part, and then plant them in a shady border, in rows twelve inches asunder, planting each cutting half or two thirds into the ground; give water in dry weather, and probably those planted in August will be rooted the same year; they, however, will be all well rooted next summer, and shoot at top, perhaps a foot long, by the following autumn, at which time, or in the spring after, they may be transplanted or bedded out in wide nursery rows, to acquire strength for final transplantation.

In both the above methods of propagating these trees, they may be trained either bushy, of a shrub-like growth, or trimmed up to a single stem for standards.

PSIDIUM, Guava-tree.

Two exotic trees of the Indies are the principal species of this genus, and are retained here in stoves for variety, garnished with oval and oblong leaves, and pentapetalous flowers.

Class and order, *Icosandria Monogynia*.

Characters.] CALYX is monophyllous, campanulate, and five-parted at top. COROLLA, five oval, concave, patent petals. STAMINA, twenty or more short filaments and small antheræ. PISTILLUM, a roundish germen under the calyx, long style and simple stigma. PERICARPIUM, a large, oval, baccaceous fruit, having numerous small seeds.

The species are,

1. PSIDIUM *pyriferum*.

Pear-fruited Psidium.] Rises with a woody thick trunk, branching twenty feet high, having quadrangular branches and a smooth bark, narrow, oval, obtuse, opposite leaves, and the pedunculi having one flower, succeeded by an oblong pear-shaped fruit.

2. PSIDIUM *pomiferum*.

Apple-fruited Psidium.] Grows twenty feet high; narrow, oblong, pointed leaves, and the pedunculi terminated by three flowers, succeeded by apple-shaped fruit.

These plants must be kept in pots, and always placed in the stove.

They are propagated by seed obtained from the West Indies, sown in pots and plunged in a bark-bed; and when the plants are come up three or four inches high, plant them in separate pots, and manage as other exotics of the stove.

PSORALEA.

This genus furnishes some shrubby exotics for the green-house, and sometimes retained in stove collections, garnished with pinnated and

and trifoliate leaves, and papilionaceous flowers.

Class and order, *Diadelphia Decandria*.

Characters.] CALYX is monophyllous and five-parted, having the lower segments twice the length of the others. COROLLA is papilionaceous and pentapetalous. STAMINA, ten diadelphous filaments and roundish antheræ. PISTILLUM, a linear germen, subulate, long, ascending style, and obtuse stigma. PERICARPIUM, a compressed pod, having one kidney-shaped seed.

The most noted species are,

1. *PSORALEA pinnata*.

Pinnated African Psoralea.] Rises with a woody soft stem, branching five or six feet high, pinnated leaves of three or four pair of narrow lobes, terminated by an odd one, and at the axillas close-fitting blue flowers with white keels. It is a native of Ethiopia.

2. *PSORALEA bituminosa*.

Bituminous Italian Psoralea.] Rises with a shrubby stalk, branching sparingly, about two or three feet high, trifoliate or three-lobed leaves of a bituminous scent; and blue flowers in close heads. Grows in Italy and in France.

3. *PSORALEA aculeata*.

Prickly African Psoralea.] Rises with a shrubby branching stem three or four feet high, trifoliate leaves, having wedge-shaped lobes, terminating in a recurved sharp point, and the branches terminated by roundish heads of blue flowers. Grows in Ethiopia.

4. *PSORALEA cytisoides*.

Cytisus-like, Cape Psoralea.] Grows with a shrubby stem and branches, pinnated, three and five-lobed leaves, and axillary clusters of flowers.

These plants flower here every summer; the first sort greatest part of that season, and the others in July and August; all of which are succeeded by seeds in autumn.

Keep them in pots in order for removing into the green-house in winter.

They are propagated by seeds, sown in a hot-bed in the spring; and when the plants are two or three inches high, prick them in separate small pots, and gradually hardened to the open air, so as to bear it fully by the end of May or beginning of June.

They may also be propagated by cuttings any time in summer, planted in pots and plunged in a little heat, or covered close with hand-glasses, shaded from the sun, and watered.

PTELEA, Shrub Trefoil.

The plants are of the shrub kind, consisting of two species only, one for the shrub-

bery, the other for the stove, garnished with trifoliate and simple leaves, and tetrapetalous flowers in bunches.

Class and order, *Tetrandria Monogynia*.

Characters.] CALYX is small and cut into four parts. COROLLA, four oval-lanceolate spreading petals. STAMINA, four awl-shaped filaments, having roundish antheræ. PISTILLUM, a roundish compressed germen, short style, crowned by two obtuse stigmas. PERICARPIUM, a roundish bilocular membrane, having two seeds.

The species are,

1. *PTELEA trifoliata*.

Trifoliate Ptelea, or Carolina Shrub Trefoil.]

Hath a shrubby upright stem, dividing into a branchy head eight or ten feet high, covered with a smooth purplish bark, trifoliate leaves formed of oval-spear-shaped folioles, and the branches terminated by large bunches of greenish-white flowers, succeeded by roundish, bordered capsules.

2. *PTELEA viscosa*.

Viscous Indian Ptelea.] Rises with several strong shrubby stems, branching erectly twelve or fifteen feet high, having a light-brown bark; spear-shaped, stiff, simple leaves; and the branches terminated by clusters of greenish flowers.

The first species is a hardy deciduous shrub, and a proper plant for the shrubbery and other ornamental plantations, to increase the variety.

The second sort being of the temperature of stove exotics, must be kept mostly in the hot-house, except about two or three months in the heat of summer, when they may be set in the open air.

The first sort is propagated by seed, layers, and cuttings.

By Seed.—In March, or beginning of April, sow the seed in a bed of light mould, half an inch deep; or to bring them as forward as possible, may sow them in pots, and plunge them in a moderate hot-bed, just to bring up the plants an inch or two high: give occasional waterings all summer, and protection from severe frost in winter; and in spring following plant them out in nursery-rows, to acquire strength for final transplantation.

By Layers.—Perform this in autumn; chuse the young shoots, give them a small slit underneath, then lay them in the earth, and they will be rooted in a year's time.

By Cuttings.—In the spring cut off a quantity of young shoots, plant them thick in pots, which plunge in any hot-bed, or in a bark-bed, just to strike them: they will readily

readily root, and be fit to transplant the following autumn.

The second species is propagated commonly by seeds: sow them in pots, and plunge them in a hot-bed; when the plants are two or three inches high, prick them in separate pots, plunging them also in the hot-bed, or in the bark-bed of the stove.

PULMONARIA, Lung-wort.

The plants are hardy, herbaceous, fibrous-rooted perennials, medical and flowery plants, rising with annual stalks, from about ten or twelve inches to a foot and half long, having oval and heart and spear-shaped leaves, and terminated by bunches of pentapetalous flowers.

Class and order, *Pentandria Monogynia*.

Characters.] **CALYX** is monophyllous, five-corned, quinque-dentate, and permanent. **COROLLA** is monopetalous, funnel-shaped, with a cylindric tube, and the limb half cut into five obtuse, erect, patent segments. **STAMINA**, five short filaments, having erect connivent antheræ. **PISTILLUM**, a four-parted germen, one filiform style, and obtuse stigma. **PERICARPIUM**, none; four roundish seeds lodged in the persistent calyx.

There are about six species: some are cultivated for medicine, others to increase the variety of the herbaceous collection.

The most material species are,

1. **PULMONARIA officinalis**.

Common Officinal Spotted Lung-wort.] Hath the root crowned with oval-heart-shaped, rough, white-spotted leaves, and upright stalks near a foot high, terminated by bunches of red, purple, and blue flowers.

It is cultivated both for medicine and for variety in the garden:—is good for disorders of the lungs, coughs, and consumptions.

2. **PULMONARIA angustifolia**.

Narrow-leaved Lung-wort.] Hath narrow, spear-shaped, hairy, radical leaves; upright stalks about a foot high, terminated by bunches of flowers, becoming of a fine blue colour.

3. **PULMONARIA virginica**.

Virginian Lung-wort.] Rises with upright stalks about a foot and half high; spear-shaped, obtuse, smooth leaves; and the stalks terminated by clusters of blue flowers.

Varieties.] With red flowers, — purple-flowered, — white-flowered.

All these species flower in April and May, and the seeds ripen in June and July.

They are all perennial in root, which is of the fibrous kind; but they are annual in stalk, rising in the spring, and after having flowered and perfected seed, they decay: they are

very hardy plants, and will grow almost any where, but delight most in somewhat shady situations.

They are propagated by seeds and by parting the roots.

By seeds.—Sow them in the spring in any bed or border of common earth, and rake them in; they will soon come up, and in July or August put out the plants either where they are to remain, or in nursery beds till October, then transplanted finally.

By parting the roots.—Autumn, about August or September, is the proper time; but the sooner after they have done flowering, the better; do not divide them too small, and plant the slips directly, and they will flower strong the following spring.

PUNICA, Pomegranate tree.

Two species, of the tree and shrub kind, are the principal species retained in our gardens, one a moderately hardy fruit tree, the other a somewhat tender shrub, both of them cultivated chiefly for variety; are adorned with spear-shaped and linear leaves, and pentapetalous fine red flowers.

Class and order, *Icosandria Monogynia*.

Characters.] **CALYX** is monophyllous, bell-shaped, quinque-dentate at top, coloured, and permanent. **COROLLA**, five roundish, erect, spreading petals, inserted into the calyx. **STAMINA**, twenty or more short filaments having oblong antheræ. **PISTILLUM**, a germen under the receptacle, single style, and a capitated stigma. **PERICARPIUM**, a large, roundish, apple-shaped fruit, having nine cells filled with roundish succulent seeds.

One of the species, *Common Pomegranate-tree*, produces a very large eatable fruit called a Pomegranate, though they seldom attain true perfection in this country.

The species are,

1. **PUNICA granata**.

Common Pomegranate-tree.] Rises with a tree stem, branching numerously all the way from the bottom, growing eighteen or twenty feet high; spear-shaped, narrow, opposite leaves; and the branches terminated by large most beautiful red flowers, succeeded by large roundish fruit, as big as an orange, having a hard rind filled with soft pulp and numerous seeds.

Varieties.] Large double-flowered, remarkably beautiful, — striped-flowered.

These trees are deciduous, grow naturally in Italy, Spain, and Portugal, where they ripen fruit abundantly; in this country, however, they require a warm situation; and if trained against a south wall, they will sometimes

times produce full-sized fruit, though it rarely ripens with any tolerable flavour; but as both the flowers and fruit make a fine appearance, a few of the trees merit culture in every good garden.

They all flower abundantly in July, August, and September, and the fruit ripens in autumn.

2. *PUNICA nana*.

Dwarf American Pomegranate.] Rises with a shrubby stem, branching four or five feet high, narrow short leaves, and small red flowers, succeeded by small fruit; begins flowering in July, and continues till October.

The first of these species is a moderately hardy tree, and may be planted for ornament in shrubberies and other plantations for the beauty of their flowers; but it is advisable to plant some also against a warm wall and train them like other wall-trees; they will generally flower more abundantly, and have a chance to ripen fruit; it should be observed, as they produce their flowers always on the young shoots of the year, arising principally from those of the year before, it is therefore proper to train in plenty of the strongest best placed shoots of each year, which in winter should be shortened to promote their furnishing a greater supply of young wood in summer for flowering; and let them be trained to the wall at equal distances, and managed nearly as directed for peaches and nectarines, &c.

The double-flowered variety produces much larger and more beautiful flowers than the others; it is therefore in greatest estimation to cultivate for ornament.

The second sort being rather tender, it is proper to plant it mostly in pots, in order to have shelter of a green-house in winter.

Both the species and varieties are propagated abundantly by layers; autumn is the proper season: chusing the young branches, give a little slit underneath at a bud, and lay them in the usual way, giving occasional waterings in summer; and by next autumn they will be well rooted, and fit to transplant in nursery rows for two or three years, to get strength, and then planted where they are to remain.

Those of the common sort and varieties may be trained as standards, either as half or full standards, or as dwarfs.

But those designed for walls must be managed accordingly, as directed for peaches, &c. as aforesaid.

PYRUS, Pear-tree, comprehending also the Apple-tree and Quince-tree.

The Pear, Apple, and Quince, were long considered as so many distinct genera: but the botanists having discovered their characters to

be alike, have ranged them all as species of the same genus; and as such we will also consider them, and arrange them accordingly: they are all of the tree kind, adorned with oblong and oval leaves and pentapetalous icofandrous flowers.

Class and order, *Icofandria Pentagynia*.

Characters.] **CALYX** is monophyllous; concave, divided into five spreading segments and permanent. **COROLLA**, five large concave petals inserted into the calyx. **STAMINA**, twenty, or more, short awl-shaped filaments, having simple antheræ. **PISTILLUM**, a germen situated under the calyx, supporting five styles, having simple stigmas. **PERICARPIUM**, a roundish umbilicated fruit with five membranaceous cells, each having one oblong smooth seed or kernel.

Agreeable to the above characters, the *Malus*, Apple-tree, and *Cydonia*, the Quince-tree, formerly considered as distinct genera, are, according to the Linnæan sexual botany, retained as species only of *Pyrus*: they are certainly all of the same family; for, besides their agreement in characters, all the three sorts will readily take by grafting and budding upon one another; however, as the Pear, Apple, and Quince, have always been considered as different sorts of fruit, each sort being of a peculiar shape and property, and each comprehending many varieties, we will arrange each species and its varieties under a separate head, viz. Pear Kinds,—Apple Kinds,—and Quince Kinds, all under the generic name *Pyrus*.

Pear Kinds.

1. *PYRUS communis*.

Common Pear-tree.] Rises with an upright large trunk branching thirty or forty feet high, in some widely around, others more erectly, often forming a conical head; oval-lanceolate, serrated leaves, and corymbose clusters of white flowers from the sides of the smaller and extreme branches, succeeded by large fruit extended at the base; of different properties in the numerous varieties.

The botanic description is—*Pyrus* with oval serrated leaves, and flowers in a pedunculate corymbus.

Varieties.] There is only one species of this tree; but it comprehends almost endless varieties, all of which being of the above description, and bear their flowers and fruit upon spurs arising from the sides and extreme parts of the branches, when of from three or four to many years old, the same branches and spurs continuing fruitful a great number of years; the different varieties furnishing fruit for use from the beginning or middle of July until May or June

June next year; which, according to their times of ripening, may be divided into three classes; Summer Pears, Autumn Pears, and Winter Pears; the Summer Pears ripening in different sorts from July until the middle or end of September, and are generally fit to eat from the tree, or at least, do not keep above a week or two before they rot. And the Autumn Pears attain perfection of full growth in September and October; some of which ripen maturely on the tree for immediate eating, in that season, others, being gathered, require to lie some time in the fruitery, and some will keep two months: but all the Winter Pears, although they attain to their full growth on the tree by the end of October, yet in the general part they do not acquire perfection for eating till they are gathered and have lain some time in the fruitery to mellow, some one, two, or three months, others longer; so that, in the different varieties, they attain maturity for eating from the end of November till April and May; those of each class having different properties, some being melting, others breaking, some mealy; and some are hard and austere and can be used only for kitchen uses; but our list consists mostly of eating Pears, with a few of the choicest hard Pears for baking and stewing, &c. though any of the large eating Pears may also be used occasionally for culinary purposes, before they are quite ripe.

As many of the fine sorts were first obtained from France they are still continued in most catalogues by the French names; observing that as the varieties of the fruit are very numerous, we shall only give a list of the most valuable, arranged in three classes,—Summer Pears,—Autumn Pears,—Winter Pears.

Summer Pears.

Summer Pears are such as ripen for immediate eating off the trees, from the beginning or middle of July until the middle of September, and continue but a short time in perfection: some of the earliest sorts keep good only a few days before they become mealy and rotten; and very few of the sorts will last much above a fortnight; but by having different varieties, the succession may be continued two months or ten weeks, till succeeded by the autumnal sorts, which will continue for eating from the end of September till Christmas.

Little Musk Pear.] A small, roundish, yellow Pear of a musky flavour, valuable for its early perfection: ripe, beginning or middle of July.

Green Chiffel Pear.] A smallish, nearly oblong, light-green Pear, melting very juicy and agreeably flavoured: ripe, middle or end of July and beginning of August.

Red Muscadelle, or Fairest Supreme.] A middle-sized, beautiful, red-striped and yellow Pear, somewhat firm, breaking juicy and rich flavoured: ripe, the end of July and beginning of August.

Jargonelle Pear, commonly so called, but is properly Cuisse Madame, (Lady's-thigh).] A largish, long, pyramidal, russety-green Pear, tinged with brown next the sun, having a fine, breaking, juicy pulp, of a most delicious rich flavour; is the best summer Pear in the world, and the tree a good bearer, both in standards, espaliers, and against walls: ripe towards the middle of August.

Cuisse Madame Pear, commonly so called, frequently called Windsor Pear, but is properly the Jargonelle.] A fine, large, oblong, smooth, yellowish-green Pear, sometimes reddened next the sun, having a firm pulp tolerably juicy and agreeably relished, though not high flavoured, and is apt to become mealy when full ripe; but being a large handsome fruit, and the tree a remarkable good bearer, it highly merits culture, as one of the principal summer Pears, and is particularly profitable for the supply of the markets, and for which the trees are abundant in the gardens and orchards several miles round London, and in many other places: ripe towards the middle of August.

Windsor Pear.] A large oblongish Pear, somewhat similar to the last mentioned, but generally more swelling upwards, of a greenish-yellow colour, having a softish pulp, but soon becomes mealy: ripe, middle or end of August.

This sort and the former bear a great resemblance to each other; but this is rather shorter and more swelling towards the crown.

Great Blanquette Pear.] A large, roundish, yellowish-green, smooth Pear, having a soft juicy flesh of a rich flavour: ripe, beginning or middle of August.

Little Blanquette Pear.] A small, roundish, smooth, yellowish-green Pear: ripe, middle or end of August.

Early Russet Pear.] A middle-sized, oblong, reddish Pear, melting and replete with sugary juice: ripe about the middle of August.

Musk Robine, or Queen's Pear.] A small, roundish, top-shaped, yellowish-coloured Pear, tender, sweet, and musky: ripe, middle or end of August.

Red Orange Pear.] A middle-sized globular Pear, reddened on the sunny side, the other green; melting and richly flavoured: ripe, end of August.

Perfumed Pear.] A middling, roundish, deep-red Pear, spotted with brown, having a melting perfumed flesh: ripe, end of August.

Orange

Orange Musk Pear.] A large, round, yellow Pear, very good if eaten from the tree, as soon as a little ripe: it ripens at the end of August.

August Muscat, or Royal Pear.] A largish, globular, whitish-yellow Pear, breaking, sugary and perfumed, and one of the finest Pears of the season: ripe, end of August.

Onion Pear.] A middle-sized, globular, brown-skinned Pear: ripe, end of August.

Salviati Pear.] A largish, globular, flattened Pear, reddish and yellow to the sun, and whitish on the other side, tender and agreeably flavoured: ripe, beginning of September.

Red Admirable Pear.] A large globular Pear, crimson-coloured on the sunny side: ripe, in September.

Summer Bon Chretien, or Good Christian.] A fine, large, oblong Pear, beautifully reddened next the sun, and whitish on the other side, breaking and highly flavoured: ripe, beginning of September.

Rose Water Pear.] A middle-sized, globular, brownish-red, rough Pear, breaking and finely flavoured: ripe, middle of September.

Summer Bergamot Pear.] A largest, round-flatted, greenish-yellow Pear, melting and sugary: ripe, middle of September.

Varieties.] There are two or three varieties of this sort that differ in size, but are all of the Bergamot shape.

Orange Bergamot Pear.] A largish, round, flattened, yellow Pear, reddish next the sun, breaking and replete with perfumed juice: ripe towards the end of September.

Other Summer Pears are known by the following names: Primitive Pear,—Catharine Pear,—St. James's Pear,—Crawford Pear,—Citron des Carmes,—Pear Piper,—Brute Pear,—Muskdrone,—Lammas Pear,—Lemon Pear,—Green Musk Pear,—Long-stalked Blanquette,—Lord Chincy's green Pear,—Prince Pear.

All the kinds of Summer Pears ripen on the trees fit for eating, but should be gathered before they are too ripe.

Autumnal Pears.

Autumn Pears are such that attain their full growth on the trees from about the middle and end of September till the end of October, and which after being gathered gradually mellow and improve in flavour, and will keep some a month, others six weeks, and some two months or longer, being in eating in the different varieties, some in September, others principally in October, November, and December.

Autumn Bergamot Pear.] A middle-sized, roundish, flattened, yellowish-green Pear, faintly reddening next the sun, melting, and of a richly

perfumed flavour: ripe, the end of September or beginning of October, continuing good until the end of November.

Swiss Bergamot Pear.] A middle-sized, roundish, greenish Pear, finely striped with red, melting and tolerably well flavoured: ripe, end of September, continuing in eating till November.

Great Russelet Pear.] A large oblong brown and reddish Pear, sometimes spotted, having a tender rich pulp: ripe, middle or end of September.

Brown Beurre, or Beurre de Roy Pear.] A fine, large, oblong, russety, brown and greenish Pear, very melting, juicy and sugary, and is one of the finest Pears of the autumn: ripe, beginning of October, and keeps good till December.

White Beurre Pear.] A large, roundish, top-shaped, whitish-yellow Pear, melting, very juicy and good: ripe, beginning of October, and keeps till November.

Red Beurre Pear.] A large, oblong, reddish Pear, melting and very fine: ripe, beginning of October.

Green Sugar Pear.] A middle-sized, top-shaped, smooth, green Pear, full of a rich sugary juice: ripe, end of October, and keeps good all November.

Messire Jean, commonly called Monsieur John Pear.] A largish, nearly round, swelling, brown Pear, with a rough skin, having a breaking delicious pulp: ripe, end of October, continuing in perfection all November and part of December.

Crasanne Pear.] A large, somewhat globular, flattened, greenish-yellow, russety Pear, hollowed at the top, is remarkably tender and sweet, and may be ranked as the finest Pear of the season: ripe, end of October, keeping good till December.

Swan's-egg Pear.] A moderately large, egg-shaped, dusky-green Pear, brownish next the sun, is very juicy and agreeably flavoured: ripe, the middle and latter end of October, continuing in tolerable perfection till near Christmas.

Verte Langue, Long Green Pear, or Autumn Mouth water.] A large, long, very green Pear, is melting and juicy: ripe, in October, and continues till December.

Marquis's Pear.] A fine large, swelling, flat-topped, greenish-yellow Pear, faintly spotted with red, having a tender good pulp: is in eating in November and December.

Grey Good-wife Pear.] A middle-sized, roundish, brownish-red Pear, moderately tender and well-flavoured; is in eating from the end of October till December.

Rouffeline Pear, or Long-stalked, late Autumnal Muscat.] A large, oblong, long-stalked Pear, reddish on the sunny side, is tender and of a musky flavour: in eating in the end of October and part of November.

Muscat Fleury Pear.] A smallish, globular, brownish-red, long-stalked Pear, tender and high flavoured: in eating from October till December.

Twice-flowering Pear-tree.] It often produces blossom twice a year, the first in the spring, and the second in Autumn, so is preserved in many gardens as a curiosity.

Other varieties of autumnal Pears are—*Besideri Pear*—*Dean's Pear*—*Vicar's Pear*—*Vine Pear*—*Autumn Rose Pear*—*French Bergamot*—*Beurre Bergamot*—*Hamden's Bergamot*—*Brocas's Bergamot*—*Gansel's Bergamot*, a fine late Pear—*Poire Pendar*, or *Knives Pear*—*Chat Brule*, or *Burnt-cat Pear*—*Auchin Pear*—*Swiss Bergamot*—*Longueville Pear*—*Scotch Bergamot*—*Pound Pear*, very large.

All the autumn Pears should have their full growth on the tree, but not hang till quite ripe, which is the middle or end of September and in October, being their season of full growth.

Winter Pears.

Winter Pears arrive to full growth about the middle and end of October, and some late sorts the beginning of November, but do not attain maturity for eating until they have lain some considerable time in the house, some a month or six weeks, others two or three months or more, before they ripen, as observed below in their description, so that they succeed one another in perfection generally from about November and December until May.

By the Winter Pears being so long acquiring perfection after gathered from the tree, many persons have thought them fit only for culinary uses; but most of the following list are very fine eating Pears, after having lain the proper time to mellow.

St. Germain Pear.] A large, long, yellowish-green, extraordinary fine Pear, of the melting sugary kind: in eating from December until February.

Bessy Chaumontelle Pear.] A large oblong Pear, having one side purplish, the other of a whitish-green colour, is melting, of a very rich delicious flavour: in eating from December until March or April.

Martin Sec, or Dry Martin Pear.] A large, oblong, russety-reddish Pear, is breaking, somewhat dry, but of a fine perfumed flavour: in eating, end of November, December and January.

Colmar Pear.] A large, swelling, flat-top-

ped, greenish-yellow Pear, spotted with yellow; is tender and exceedingly fine flavoured: in eating from December till January or February.

Spanish Bon Chretien.] A large pyramidal purple and yellow Pear, having many dark spots on the purple side; is a fine Winter Pear, ready for eating the end of December, continues good near two months.

Virgoleuse Pear.] A large, oblong, greenish-yellow Pear, sometimes brownish next the sun, is an excellent fruit: in eating from the beginning or middle of December until the end of January.

Dauphine Pear.] A middle-sized, roundish, top-shaped, smooth, yellowish-green Pear, having a melting, sugary, musky pulp: in eating the end of November, continuing in perfection all December and most part of January.

Winter Verte Longue Pear.] A longish, green-coloured, smooth, spotted, exceeding good Pear; in eating the end of December and January, &c.

Winter Beurre Pear.] A middling-sized, oblong, yellowish, red-spotted, very fine Pear; ready for eating in December and January.

Epine d'Hyver, or Winter Thorn Pear.] A large, long, pyramidal whitish-green Pear; is melting, and in fine eating from December till February.

Martin Sire, or Lord Martin Pear.] A large, roundish, irregularly-swelling, smooth Pear, red on one side, the other yellow; is breaking and of a perfumed flavour: in eating in December and January.

Winter Bergamot Pear.] A middle-sized, roundish, greenish-yellow Pear: in eating from the end of November until the spring.

Holland Bergamot.] A large, round, greenish Pear, having a tender rich pulp; in eating from January till April.

Winter Bon Chretien.] A very large, long pyramidal, yellowish-green Pear, having often an uneven surface; is breaking, very juicy, remarkably sweet and rich flavoured, and often proves the best Winter Pear in the collection: in eating from February till April or May.

German Muscat Pear.] A middle-sized, oblong, russety-red Pear, having a melting rich pulp: in eating from February till May or longer.

Easter Bergamot Pear.] A large, roundish, flat-topped, greenish Pear, having many rough spots, is of the breaking kind; and is in eating from February till April or May.

Winter Russet Pear.] A middle-sized, longish Pear, red on one side, the other of a greenish-yellow, is melting and agreeably

bly relished: in eating in January, March, &c.

St. Martial Pear.] A longish, oblong, smooth Pear, one side purple, the other yellow; having a buttery rich flesh: in eating from February till May or June.

Cadillac Pear.] A very large, roundish, red and yellow Pear, having a hard, tartish pulp, but is excellent for baking and other culinary purposes: in use from November or December till May.

Union Pear, or Uvedale's St. Germain.] A large, long, deep-green Pear, reddish on one side, having a hard, sour pulp, but is excellent for baking, &c. in perfection from November or December till May or longer.

Great Black Pear of Worcester, or Parkinson's Warden.] A remarkably large, oblong, dusky brown, rough Pear, having a hard austere pulp, but is very fine for culinary uses, from November till March or April.

Double Flowered Pear.] The tree produces double flowers succeeded by a large, short, yellowish and red Pear, rather hard and austere; but is remarkably fine for baking, &c.

Other different varieties of Winter Pears are known by the following names—*Good Lewis*, a large longish Pear—*Ambrette*, a large roundish Pear—*Thick-stalked Pear*, a very large roundish fruit—*Amadot*, a middle-sized oblong Pear—*St. Austin*, a middling-sized oblong Pear—*Russet of Anjou*, a large roundish Pear—*Seven-elbowed Portugal Pear*, large and good.—*Echassieri, or Winter Green Sugar Pear*, a large, oblongish, fine fruit.—*Bessy di Cassoy*—*Iron-coloured Pear*, a middle-sized oblong fruit—*Golden Winter Pear*, a large globular fruit—*Villain of Anjou*, a large roundish Pear—*Wonder of Winter*, very large—*Chauceau du Roi Bergamot*, a very fine Pear—*Carlisle Pear*—*Tarling Pear*, a middling, largish, very fine eating fruit—*Carmelite*, a middling roundish Pear for kitchen uses—*Winter Citron Pear*, for baking—*Blood Pear*, for baking, &c.—*English Warden*, a large Pear for baking and other culinary uses.

There are many other varieties of Pears of less account, both of Summer, Autumn, and Winter kinds, that are unnecessary to insert here; and indeed it would be almost impossible to discriminate the various sorts of Pears, found in the orchards and gardens in country villages, and about farm houses, in different parts of England, &c.

But as the varieties described in the above three lists having known merit, and are cultivated in most of the nurseries for sale, by the names here prefixed to each kind, consisting of near sixty different sorts, besides the others briefly mentioned, are more than sufficient to

furnish the most extensive garden with a copious variety of eating Pears almost the year round:—and for culinary occasions, besides the sorts particularly mentioned for that purpose, may use almost any of the large hard Pears, especially of the autumn and winter kinds.

All the varieties of this tree are hardy, and will succeed in any common soil of a garden or orchard, both as dwarfs for walls and espaliers, &c. and in standards of all sorts; and in all of which modes of training they will bear plentifully.

And as Pears are very desirable principal table fruit, obtained in perfection several months in the year for eating, in the early, middle, and late kinds, and many sorts valuably useful in culinary occasions, such as for baking, stewing, &c. and also for making the liquor called perry, every proprietor of gardens, orchards, and other districts, should allot a chosen collection of the most approved different varieties, more or less, according to his extent of ground; generally a larger supply in standards for the principal production; and choose principally some of the prime sorts for walls and espaliers, in which to improve the goodness of the fruit; and in each order of training, have rather a smaller portion of the summer Pears, of the best sorts, doubly more of the best autumn kinds; and a principal supply of the most capital winter Pears, all of which may be plentifully raised by grafting and budding upon seedling Pear and Quince-stocks, as hereafter directed; and most of the sorts are to be had at the different nurseries; and may be planted in autumn or spring, or any time in open mild weather, from the latter end of October or beginning of November, till March.

In intending to plant a collection of Pear-trees, no time should be lost, when it is considered that these trees, suppose at planting, have two, three, or four years' old heads, seldom begin bearing till of five or six years growth, and often in some sorts, seven, eight, or ten, before the branches form their first fruitful growth, in any general production; especially in some strong shooters, worked on free or Pear-stocks, which are generally longer before they commence bearers, than those grafted or budded upon Quince-stocks, by reason of the latter being moderate growers, and the trees worked thereon shoot moderately to wood accordingly, and sooner become prolific in natural fruit-buds for bearing; and are very often trained in dwarfs for wall and espalier trees, and sometimes in small standards.

But for general standard Pears it is most eligible to allot a principal supply of the common full standard trees, grafted or budded on

free shooting Pear-stocks, having clean six feet stems, elevating the head at that height from the ground, and planted abundantly in gardens and orchards, &c. twenty to thirty or forty feet distance; both of summer, autumn, and winter Pears, as before intimated.

Likewise, in wall and espalier trees, worked both on Pear-stocks for larger expansion, and on Quince-stocks for moderate growth, as may be required, it is of importance to allot a good wall and espalier for some of the choicer kinds, both Summer, Autumnal, and Winter Pears, in order both to forward the growth of the fruit and to improve its size, beauty, and flavour: a south, east, and west-erly wall are the proper exposures; and it is eligible to plant some in each of those aspects, to vary the times of ripening, though most of the Summer Pears will succeed very well in almost any aspect, and if some are planted also against a north wall they will ripen later and continue the succession of any approved sorts longer in eating; but it is particularly necessary to allow all the fine sorts of Winter Pears an east or west wall, or a well exposed espalier, otherwise they will not perfect their fruit kindly in unfavourable seasons; in espaliers, however, that are well trained, all the sorts of Pears attain great perfection, and the espaliers may be arranged round the quarters of the kitchen garden, or in any other free situation where the soil is of similar quality. See ESPALIER.

Remarking, that these trees, both against walls and espaliers, should generally be allowed a great deal of room to spread, especially the larger sorts, grafted or budded on free stocks, for by having full scope they will extend their branches horizontally, more than twenty feet on each side of the stem, and the whole will sometimes form a spread of forty or fifty feet, with height in proportion.

The above extensive expansion, however, occurs principally in trees as are grafted or budded on free stocks, i.e. such as are raised from the kernels of any sort of Pears, which being strong free shooters, the trees worked thereon shoot strong and extensive accordingly, but when worked upon Quince-stocks, which are of the same family, but very moderate growers, it dwarfs the trees considerably in proportion, as they shoot moderately in much smaller extent of growth, and sooner form themselves into a prolific state, for production of fruit; and are more generally adopted for wall and espalier trees, than for common standards, but some reject them as stocks for any general culture, on a supposition that the trees are not so durable as those on Pear stocks.

Standard Pear trees, in some sorts, also assume a very extensive spreading growth in the branches, and some grow in a more upright direction; I have observed an old standard Pear that was advanced to a surprising magnitude, both in the trunk and principal branches, and of a stupendous height, and the branches of such extensive expansion horizontally; that the lower ones extended so widely over some low cottages, they were obliged to be supported on strong upright props; and the tree produced many bushels of Pears annually.

However, in all the methods of training these trees, it is highly requisite to allow them sufficient room to spread to their full extent, and their branches suffered to extend themselves always at full length; for Pear-trees should never be shortened, except in the first or second year, &c. to obtain a supply of lateral branches to form a more regular spreading head, as hereafter elucidated, because as they always bear their blossom and fruit upon short spurs arising from the sides of the branches, first, however, towards the extreme parts, then by degrees all along the sides almost from every eye, that shortening would cut away the first fruitful parts, and thus by stopping their progress of shooting in length it would force out strong shoots from all the lateral eyes, and prevent their forming spurs or fruit-buds at those parts; but being trained at full length, they shoot moderately, and in two or three years naturally form short spurs of from about half an inch to an inch or two long, the same branch and spurs continuing fruitful a great number of years.

But it must be observed, that Pear-trees are generally several years before they attain any tolerable bearing state, for the branches seldom begin to form fruit-spurs till they are from about two or three, to four or five years' old; at that age, however, they sometimes begin to bear, but never any general crop till they are eight or ten years' old.

Method of Propagation, and general Culture in the Nursery.

Pear-trees are propagated by grafting and budding upon any kinds of Pear-stocks; also occasionally upon Quince-stocks, and sometimes upon white-thorn stocks, but Pear-stocks are greatly preferable to all others for general use, whereby to have large trees, and the Quinces for moderate growers.

The numerous varieties of Pears having been first accidentally obtained from seed, and as seedlings of these varieties rarely produce the same sorts again, the approved kinds are continued and increased only by grafting or budding upon stocks raised from the kernels of any kind of Pears,

Pears, as above said; or occasionally upon Quince-stocks, especially for dwarfs of any sort, as the Quince being a moderate shooter, as before observed, they moderate the growth of the trees grafted or budded thereon, so as to be more easily kept within a smaller compass; and bear two or three years sooner, more prolifically according to size, and for the same reason, white thorn stocks have been used, but these, being of a different fraternity, are not so generally successful, and are almost totally disused in the nurseries, so that Pear-stocks are proper for general use, for principal large trees, both for walls, espaliers, and standards, and Quince-stocks for smaller growths; observing therefore to raise proper supplies of stocks of these two kinds, less or more of each, as required; effected by sowing the kernels of the fruit of any sorts of Pears and Quinces, the latter also by suckers, layers, and cuttings: procuring the kernels of the perfectly ripe fruit of summer and autumnal Pears, the same of the Quinces, and sow them in the latter end of autumn, October, November, or December, &c. or early in the spring months, in beds of light earth, covering them near an inch deep; they will come up in the spring, and in autumn, winter, or spring following, plant out a parcel of the strongest in nursery-rows to remain for grafting and budding, which after having from one to two or three years' growth here, or when about half an inch to an inch thick, or a little more or less, they will be of proper size to receive the grafts and buds.

The grafting and budding them is to be performed in the usual method, performing the grafting in the spring, and the budding in summer (See GRAFTING and INOCULATION): being particularly careful to procure the grafts and buds from such trees as produce the finest fruit of the respective sorts you intend propagating.

Being, however, provided with the grafts and buds, proceed to graft them, &c. accordingly for dwarfs and standards; observing, that those designed as dwarfs for walls, espaliers, or standard-dwarfs, be grafted or budded near the bottom; and for half and full standards, the stocks may either be previously trained up from three or four to seven or eight feet high to form a stem, then grafted near the top, or may be grafted low in the stock, like the dwarfs, and train the first main shoot for a stem the above height; all the grafted trees both dwarfs and standards will shoot the same year, but the budded ones not till the spring after; and when their heads are two years old from the grafting and budding, they may, if thought proper, be

planted out for good, or remain longer in the nursery, as may be convenient.

Observe, however, that the dwarfs designed for walls, espaliers, &c. whether they remain longer in the nursery, or are transplanted at a year old into the garden, should have the first shoots from the graft or bud when a year old, headed down in March to five or six eyes to force out a proper supply of four, six, or more lateral branches near the ground, to furnish the wall and espalier with bearers quite from the bottom, and these will readily produce others to cover the upper part.

But standards, supposing them to be grafted on high stocks, may either be headed near the top of the stock, or permitted to run up, as the case may require, that if shortened it will force out laterals near the head of the stem, and form a more spreading full head; and if suffered to run up with the first shoots entire, they will form higher, and generally more upright heads in the end; such standards, however, that are grafted or budded as low in the stock as for dwarfs, must have the first shoot trained upright at full length, six or seven feet high for a stem, if for full standards, then may either top it at six feet height, to force out laterals near that part to form a spreading head as aforesaid, or suffer it to run and branch in its own way to form a more erect and higher head.

All the headed trees, however, both dwarfs and standards, being cut down in the spring, will soon branch out from all the eyes immediately below; being careful during the summer to trim off all shoots from the stem, and suffer all the top shoots to remain entire, and they will form handsome beginning young heads by the end of summer: and in autumn, winter, or spring following, they may have their final transplantation into the garden, &c. provided it was not done before heading down.

But if obliged to retain them longer in the nursery, let the whole have any requisite pruning to reform irregular growths, and the different trees trained accordingly, agreeable to the form they are designed to assume, whether dwarfs for walls and espaliers, dwarf-standards, or half or full standards, suffering the whole to branch away at full length, not shortening any after the above general heading down, when a year old, except it should seem occasionally necessary, either to reduce any casual irregularity, or to procure a more sufficient supply of lower branches, after which, however, no further general shortening should be practised to these sort of trees, for after having obtained a proper set of regular branches near the head of the stem, they will readily furnish more in their turn to increase the head upwards.

Their

Their Transplantation into the Garden, &c.

When the trees, however, are from one or two to four or five years old, from the graft or bud, they are of a proper growth for planting out finally; but if larger trees are required, those of six or eight years old may be safely transplanted; younger trees, however, always succeed well, even if only two or three years old.

The season for planting them may be any time in open weather from the end of October till March; but if in autumn, or early in winter, it will be an advantage.

They will succeed in any common soil of a garden, or any good fertile orchard-ground, or field, that is not copiously wet, or very stiff or stubborn, but moderately light and pliable, one good spade deep, at least, if more the better; preparing the ground by proper trenching one or two spades deep, as the depth of good soil admits, either wholly if for a full plantation, or only along the place for each row of trees, otherwise the place for each tree; or only, at present, dig a hole for each tree at eligible distances.

First, of Planting the Dwarfs, and their general Culture.

The distance to plant Dwarf-Pears for walls and espaliers is for those on free stocks not less than twenty feet, but if twenty-five, or more, the better, especially if lowish walls, &c. that in default of height, there may be full scope to extend their branches considerably in a horizontal direction, as they will effectually fill that space, or even much more if allowed it them; but the above distance appearing very considerable at first, and the trees standing so wide having a straggling appearance for several years before they approach one another to effect any uniformity, they are rarely planted at that distance, some scarcely half so much, but seldom more than twenty feet; however, it is of importance to grant these trees sufficient room; and the higher the walls the better, which is of particular advantage to Pears, evident by those growing against the ends of high buildings, as they extend themselves very considerably every way, as before observed, and their branches requiring to be trained constantly at full length, in which they will emit fruit-tips all the way along their sides; therefore they may be planted at least twenty to twenty-five feet distance, and in each interval of twenty-five feet, may plant a cherry, or any other moderate-shooting fruit-tree, to fill the vacancy, and bear a few years, till the Pears advance in growth; and according as these approach one another, cut the others away by degrees, so as at last the Pears may occupy the whole space. Having, however, fixed on the di-

stance, and the holes dug, and the trees ready, let them be planted in the usual way, and all with their heads entire, at least for the present. See PLANTING.

However, for trees as are dwarfed by grafting or budding upon Quince-stocks, fifteen to eighteen feet is their proper distance for planting, either for walls or espaliers, and which sorts are very proper for gardens of but moderate or small extent, or any others.

The trees being thus planted, their general management, with regard to training and pruning, is nearly as follows.

Observe, in the first place, that if the young wall and espalier trees thus planted are only one year old from the graft or bud, having their first shoots of a year-old entire, these should in the spring be headed down to five or six inches, as directed in their nursery culture, to force out lower horizontals; but if they were previously headed in the nursery, as we advised, and having thereby thrown out laterals to form a regular set of horizontals, consisting of six or more regular branches near the bottom, they should not now be shortened, but trained to the wall or espalier at full length horizontally, preserving an equal number on each side five or six inches asunder, they will readily emit a further supply of horizontals to cover the wall, &c. regularly upward, and at the same time, as being not shortened, they will gradually form themselves for bearing, as every shortening of the branches of these trees retards their bearing a year at least; if, however, there is a want of branches, some of the middlemost may be pruned short, and trained to the wall or espalier. According as the trees shoot in summer, train in a farther supply of all the regular shoots in every part where they occur, at full length, unless it shall seem necessary to prune some strong shoots to obtain a greater supply of horizontals the same year in order to furnish the head as soon as possible: at this time, however, displace all fore-right and other irregular growths of the year, continuing the supply of regular shoots close to the wall, as they advance in length during their summer's growth. And in the winter pruning, examine the supply of shoots retained in summer, selecting all those that are well placed and properly situated for training in, to increase the number of horizontals regularly on each side, which leave wholly entire, and at the same time retrench any superfluities and ill-placed shoots omitted in summer; then let the whole supply of regular horizontals in every part be trained in straight and close to the wall and espalier, horizontally and equally on both sides of the tree, every branch at full length,

length, four, five, or six inches asunder, as aforesaid. See WALL and ESPALIER TREES, PRUNING, &c.

Another method sometimes practised in training these trees for walls and espaliers is, that after their first heading down, and having thrown out several laterals, select three of the strongest and most regular placed of them, one on each side and one in the middle, nail the two side ones horizontally at full length, and the middle one upright; next year the tree having produced a further supply of shoots, add two or four of them as side-horizontals, arranging them on each side of the stem as the two former, training the middle shoot still in an upright direction; observing, however, if it should not furnish horizontals low enough, it may be shortened so as to make it throw out shoots at any requisite height, continuing the middle one always upward for a stem, and the side ones horizontally for bearers.

By either of the above methods of training these trees, continue every year increasing the number of horizontals, till the allotted space of walling and espalier is regularly covered with bearers at equal distances, still continuing them all at full length in all future training, as far as the scope of walling, &c. will permit; and they will all naturally form fruit-spurs at every eye, almost their whole length, and the same branches continue in a fruitful state a great number of years.

In the general training of these trees, let it always be remembered, that the branches trained in for bearers must never be shortened, because, as we before observed, their fruit-spurs being generally produced first towards the once extreme parts, then gradually along the sides of the branches, of from two or three to many years growth, so that there is no need of shortening to procure a new supply of bearing wood annually as in peaches, nectarines, and such other trees as bear fruit upon the young wood only; but in Pears the same branches not only continue for years in a bearing state, but become every year more and more fruitful even to a great age, if not retarded and spoiled whilst in training by shortening, as is very often the case; for shortening these sort of trees, both stops their progress of growth and bearing, by reducing the length of the branches considerably, and cutting away the first fruitful parts, as they generally begin bearing first at or near the parts which was once the extremity of the shoots; and by reducing their length it forces out numerous, strong, useless shoots from the eyes below, at the places where fruit-buds would have been otherwise formed, and instead thereof crowd the tree with a great re-

dundancy of unnecessary wood, and but little fruit; but by training the bearers from the first at full length, and continued so far as the allotted space will possibly allow, they not only sooner fill the space of walling, &c. but emit fruit-buds from almost every eye, and bear abundantly.

When the trees have once thus filled the wall or espalier with the branches, they need but very little farther supply for many years, and that only occasionally, according as any worn-out or decayed branch occurs, and wants renewing with young wood. See PRUNING.

But two prunings every year are requisite to preserve their regularity and bearing state,—a summer and a winter pruning.

The summer pruning should be begun in May, or early in June, and rub off all the superfluous and unnecessary shoots of the year, and all fore-right and other ill-placed shoots, retrenching them quite close, being careful to leave the terminating shoot of every horizontal or bearer entire; and reserve here and there a well-placed shoot towards the lower parts in particular, and where there are any apparent vacancies, or at least, it is generally proper to retain some shoots as above to train up between the mother branches, till winter pruning, and if then not wanted, can be easily retrenched, training them in for the present at full length.

The winter pruning may be performed any time from the fall of the leaf until March; in this pruning examine the branches in general, see if they are any where too much crowded, or are trained irregularly; and if any such occur, let them be regulated as they may require; at the same time examine if there are any vacancies; and in which case train some contiguous shoots reserved in the summer dressing, to supply the deficiencies; all other shoots trained in last summer, not now wanted to supply any vacant space, must be cut clean out close to the branches, being careful still to preserve the terminating shoot of every branch entire, in all parts, as far as the allotted space admits, likewise all the fruit-spurs in every part, and fasten in all the branches regularly at full length.

But in winter-pruning old trees however, decayed and worn-out branches will sometimes occur; be careful therefore to cut out all decayed wood wheresoever it appears, training young, if possible, in its stead; likewise, where any branch, either through excessive age or any other defect, is become barren or worn out, let it either be retrenched to some eligible lower young branch or shoot, or may previously have young bearers in training a year or two or more from the bottom

tom between the main horizontals, which is eligible enough in old trees, when there is any apparent vacancy happening either by decayed wood or worn-out branches, and according as the young ones assume a bearing state, retrench the bad wood, and train the young supply in its place; in this case look always well to the bottom of your trees, and if any good shoots offer where there is an appearance of a vacancy like to happen, train them up between the main branches to be advancing to a bearing state, to be ready when wanted.

Where any of the choicer sorts of these trees have, through great age or some other natural cause, or by bad culture, become infirm, their branches in general either in a declining worn-out or barren state, or extended long and naked, not furnished with bearing wood, we should endeavour to renew them with young bearers, by heading the branches wholly down near the bottom in winter or spring, they will break out in the old wood, and in the following summer furnish a large supply of strong young shoots, which train agreeable to the rules before laid down, and they will soon form a new tree, as it were, and bear plenty of good fruit.

After each winter-pruning of these trees against walls and espaliers, they will require a general nailing, &c. let this always be done with great regularity, training all the branches horizontally as straight as possible their whole length, at equal distances. See WALL TREES, ESPALIERS, &c.

As to dwarf standards of these trees, see their mode of training, &c. under the article DWARF TREES.

The culture of the borders wherein these wall and espalier Pears are growing, is common digging once every year at least, and with the addition of manure occasionally in common with the other parts of the garden; though if some good rotten dung is applied every other year, and the ground well dug or trenched every winter, it will greatly promote the size and perfection of the fruit.

Planting them for Standards and general Culture.

Standards of any sorts of Pears bear plentifully in any open situation, though the fruit may not always be so large and fine as those of wall and espalier trees: summer and autumn Pears however ripen in great perfection on standards; as will also most of the common winter Pears. Observe, in planting them, that trees of from two or three to four or five years old, having tolerable heads, are of a proper age and size for planting, and are preferable to older trees for any general plantation. See

PLANTING. And that having been trained as directed in their nursery culture, and formed heads, consisting of several branches, let them be planted with all their heads entire, except retrenching any very irregular-placed branch, but retain all the others, and suffer them to remain at full length, and plant them in the usual manner of tree-planting. See PLANTING.

In their future growth suffer them to branch away as fast as they are able, according to nature, and they will soon form large branchy heads, suffering all their branches to remain entire, and extend themselves in length, and they will all emit numerous fruit-spurs, and bear plenty of fruit.

The general culture of full-grown standard Pears, in respect to pruning, is very trifling, and that only required occasionally, probably once only in several years; such as the retrenching any very irregular growing branch, such in particular as grow cross-ways, and greatly incommode the neighbouring branches; also to thin such branches that are very much crowded, and confuse the head considerably; cutting out all decayed wood and eradicate suckers from the root and stem. See PRUNING, article *Pruning Standards*.

Where these standard trees are situated in a garden, in which the ground is necessarily digged or trenched annually for the reception of the under-crops, and occasionally enriched with dung, they generally produce finer fruit than in orchards, or other districts where the ground is not in similar culture; though it may also be observed, that where the trees are situated in good ground, both in gardens, grass orchards, or other compartments, they bear plentiful crops of very good fruit.

Gathering and preserving the Fruit.

The maturity of Pears, after arriving to full growth, is generally known by their changing from a green to a yellow or reddish colour, &c. and by their frequent falling from the tree, and when with a gentle twist or turn up, easily quit their hold; but those tokens are more particularly observable in summer and autumn Pears; for winter Pears being not maturely ripe when gathered, often require a good pull before they quit the branches.

Summer Pears ripen in succession in different sorts, from about the beginning or middle of July till the middle of September; many of the earliest ripen all at once, as it were, and continue good but a few days, either on the tree or when gathered, nor will any of the sorts keep good long; and none of these sorts should hang on the tree till soft ripe, otherwise most of them will be mealy and insipid; let these

these sorts therefore be gathered as soon as they are arrived to full growth; and just begin to colour and discover maturity, but before they become soft and mellow; observing that, for family use, they may be gathered from the tree according as they attain perfection; but let the general crop of each sort be always taken down before they ripen fully, and lay them in any dry room; none of the kinds will keep long, some only a few days, and scarcely any of them above a fortnight, though from different varieties ripening at different times, the succession is continued for eight or ten weeks.

Autumn Pears ripen in different varieties, from about the middle of September till the end of October; some of the forwardest ripen eatable on the tree, others requiring to lie some time after being gathered before they acquire perfection. Let the different sorts of this class of Pears be gathered according as they arrive to maturity: those designed to keep some time should be gathered just when they have attained full growth; their maturity or full growth on the trees is known by their frequent dropping, and by their readily quitting the tree on being handled: gather them in dry weather, and lay them in a dry close room, or in baskets, each sort separate; they will thus gradually mellow, acquire rich juices, and delicious flavour.

Winter Pears attain their full growth on the trees about the end of October or beginning of November; but the eatable kinds do not acquire maturity for eating on the tree, nor for some considerable time after they are gathered, some probably in a month, others two or three, and some more, and some sorts not till spring following, and often continue in perfection till summer, as is noticed in the description of the different sorts of winter Pears; but the baking kinds may be used any time from October or November during their continuance.

All the winter Pears however should be indulged with as full growth on the tree as the weather will permit, even until the end of October or first week in November of the later kinds, if the season continues mild; be cautious, however, to get them gathered before attacked by much frost.

In gathering all sorts of Pears for keeping, always chuse dry weather, and when the fruit is also quite dry.

The method of gathering these fruit is to pull one and one by hand, by a gentle twist, or turn upward; and if they readily separate, it is a sign of full growth, more particularly the summer and autumn Pears; being parti-

cularly careful in gathering not to bruise them; and let each sort be kept separate.

According as they are gathered, carry them directly into the fruitery rooms, where those intended for long keeping, such as the late autumnal and all the winter Pears, should be previously laid up in heaps, and covered with cloths, in order to promote a perspiration, and discharge the watery moisture; which prepares them for keeping, as well as improves their flavour: this fermentation or sweating will be effected in a week or fortnight, when they should all be wiped dry with a woollen cloth; then let a quantity be deposited upon the shelves of the fruitery, to remain for first eating, and let all the others be also disposed in some similar manner, each sort separate; it will then be proper to cover the whole thickly with clean dry straw, to exclude the moist air, &c. whereby they will keep longer and more effectually in good perfection: others of the prime sorts for longer keeping may be packed up in baskets, &c. thickly lined within with straw, then some thick paper; and having filled the basket with the Pears, cover them down also with paper, then a good thickness of straw over all, fastening the whole as close down as may be, tying a label, with the name of the fruit and time of ripening, to each basket, and then place them in a close warm room; they will thus succeed those on the shelves for use, and keep good a long time; and if some are also put into large earthen jars, plugged and roined down perfectly close to exclude the external air, they will keep a long time sound, especially the latest sorts, which will keep till May or June.

They should be occasionally looked over, to remove all such as assume any tendency to decay, before they spread the putrefaction to the adjacent fruit; this should be properly attended to at intervals, to those on the shelves or any where in the open fruitery in particular, as they are more liable to putrefaction, and can be easily examined; but those packed up in close baskets, &c. are not so easily observed, nor will they require it so often; it is however proper, after some considerable time, to look them over.

Of forcing Pear-trees for early Production.

Pears in wall-trees are sometimes forced by artificial heat in forcing frames, in some of the prime early summer kinds, to obtain a portion of these desirable fruit as early in the season as possible, such as Jargonelles in June, their natural season is not till August.

This is effected by means of hot-walls and forcing frames; previously having some trees of the choicest early summer Pears, such as

the Jargonelle aforesaid, trained in wall-trees against a south wall, till advanced to some tolerable state of bearing; and being then inclosed with glass frames, in the manner of forcing-frames or hot-walls, and having internally either flues for fire heat, erected forward and extending long ways, or otherwise a pit arranged in that direction, in the interval space between the trees and the glass work, for a bark or dung hot-bed; and that by one or other of these methods a proper degree of artificial heat is produced internally within this glass-case frame, to force an early growth in the trees inclosed therein, and forward them to early flowering and fruiting; in which managing them in the common way, as other trees in forcing frames, whereby they will generally advance very agreeably in their early production, as sometimes to have some ripe early in June, or some time in that month.

For this purpose the Jargonelle is one of the principal sorts, as being the superior of all our summer Pears, of a handsome growth, middling large size, with a fine juicy, rich pulp, of a delicious flavour; however, any other principal early sort may also be admitted for the same occasion.

Apple Kinds.

PYRUS Malus.

The Apple-tree (*Malus*) being now considered as a species of *Pyrus*, as formerly observed, we have arranged it accordingly under this head, together with all its varieties, which are exceedingly numerous in the difference of the fruit: some for eating, others for baking, boiling, cider, &c. and may be said to be the most valuable fruit in the world for its various economical uses, and long continuance in perfection, which, in the different sorts, is the year round.

Class, order, and characters, are the same as the *Pyrus Communis*.

Of the Apple kind there may be reckoned four principal distinct species, viz. 1. Common apple-tree, comprising numerous varieties of the fruit—2. Berried apple or Siberian crab—3. Chinese apple-tree—4. Sweet-scented Virginia crab: of which the trees of the last three sorts are cultivated principally for variety, and only the common apple in its different varieties, as proper for general culture as valuable fruit-trees.

The species are,

1. *PYRUS Malus.*

Malus, or Common Apple-tree.] Grows twenty or thirty feet high, having oval, serrated leaves, and sessile umbels of whitish-red flowers, succeeded by large, roundish, and oblong fruit, concave at the base.

Varieties.] The varieties of this species are amazingly great, in respect to the differences of the fruit; and the botanists contend that the wilding, or crab-apple of the woods and hedges, is the original kind, and from the seed of which the cultivated Apple was first obtained; whose varieties, no doubt, are multiplied to some hundreds, in different places, having been all first accidentally obtained from the seed or kernels of the fruit of various sorts at different times in the course of a great number of years, and the approved sorts continued and increased by grafting upon crabs or any kinds of apple-stocks; but although the number of different varieties is very considerable, there are not above forty or fifty sorts retained in the nurserymen's catalogues as principal fruit, which however is doubly sufficient to furnish a successional supply of Apples all the year. The different varieties arrive to full growth in successive order, from July till the end of October; the summer kinds, that ripen before the middle of September, are many of them ripe for eating immediately from the tree, and do not keep long: but most of the autumn and winter kinds, that ripen from the middle or end of September till the end of October, improve in perfection after being gathered, as they lie in the fruitery; and many of the winter kinds in particular keep good many months, even until the arrival of Apples next summer.

The most noted varieties are generally known by the following names, &c.

Genneting, or June-eating Apple.] A small Apple, oblong and roundish in different varieties, of a most agreeable flavour, valuable for its early perfection, being in eating sometimes in June, against a wall, but on standards principally in July, and beginning of August.

Margaret Apple.] A middle-sized, oblong Apple, one side tinged with red, the other pale-green, and is highly flavoured; ripe for eating in July and August.

Common Codlin.] A largish, oblongish, irregular, greenish-yellow Apple, tinged with red, valuable for its early growth, being fit for many culinary purposes, from June till August and September, and is also a tolerable good eating Apple when arrived to maturity; ripens fully in August, becoming of a bright-yellow and red colour.

Kentish Codlin.] A large, longish, irregular Apple, excellent for culinary uses, in August and September.

Summer Pearmain.] A middle-sized, oblong, fine, red-striped Apple, good for eating and culinary uses: ripe in August and September.

Scarlet Summer Apple.] An oblong, deep-red,

red, beautiful Apple, for eating and kitchen purposes, in August and September.

Summer Calville.] A large, fine summer Apple: ripe end of August and September.

Quince Apple.] A small, roundish, quince-shaped, russet and yellow Apple; ripe for eating in September.

Summer Rambourg.] A large, handsome, variegated red and yellow Apple: ripe in August and September.

Loan's Pearmain.] A middle-sized beautiful Apple, having one side finely reddened, the other variegated also with red: ripe in September and October.

Royal Pearmain.] A large, oblong, beautifully reddened Apple, for eating and culinary uses: ripe in September and October.

Red Autumn Calville.] A moderately-large, oblong, fine-red Apple, of a vinous aromatic flavour: ripe in autumn.

White Autumn Calville.] A large, oblong, fine eating Apple: ripe in autumn.

Golden Russet.] A roundish, middle-sized, russet-yellow, good eating Apple, with a firm acid pulp: ripe in autumn.

Golden Rennette.] A middle-sized, roundish, beautiful, red and yellow Apple, having a firm fine-flavoured pulp, excellent both for eating and baking, &c. ripe in October, and continues till spring, if packed up close.

Golden Pippin.] A small, roundish, and oblong, beautiful yellow Apple, firm, and admirably fine flavoured: ripe in October, and may be kept till the spring.

Court-pendu, or Hanging Body.] A large, oblong, handsome Apple, red next the sun, the other side pale, and generally hangs downward: in eating in autumn and part of winter.

Grey Leadington Apple.] A longish, moderately large, greyish-green, very fine Apple, being a most excellent table fruit: ripe in autumn and part of winter.

Aromatic Pippin.] A middle-sized, roundish Apple, one side russet-coloured, the other side yellowish; is of an agreeable aromatic flavour: ripe for eating in October, keeping good a long time.

Violet Apple.] A largish, oblong Apple, one side reddened, the other variegated, having a firm sweet pulp, flavoured like violets: ripe in October, &c.

White Rennette.] A large, roundish, whitish-green Apple, having a firm sugary pulp, good both for eating, and for baking and boiling: ripe, end of October, continuing good till January.

Rennette Grise.] A roundish, middle-sized Apple, grey-coloured on one side, the other

tinged with yellow; in eating, from October till Christmas, or longer.

Winter Pearmain.] A moderate-sized, oblongish Apple, red on one side, the other variegated red and yellow; is tolerable for eating, but very good for boiling: ripe, end of October, continuing good all winter.

Kentish Pippin.] A large, oblongish, whitish-green Apple, good for eating, but particularly adapted for the kitchen uses, from October till spring.

Nonpareil Apple.] A middle-sized, roundish, somewhat flattened, dusky russet-green Apple, having a firm pulp, replete with a sharp agreeable juice; a most excellent winter fruit for the dessert; in eating from November or December until May.

Large Nonpareil.] A large, round, light, russet and yellowish Apple; is a fine handsome fruit, but does not continue in perfection so long as the common Nonpareil; in eating from November or December till March.

Holland Pippin.] A large, roundish-oblong, greenish Apple, having the eye pretty much sunk; is a very fine fruit, both for eating, and in great estimation for culinary purposes, from October until March or April.

Monstrous Rennette.] A remarkably large, oblong Apple, one side red, the other green, valued chiefly for baking or boiling, in November and December, &c.

None-Such Apple.] A roundish beautiful Apple, being finely tinged with red on one side; is highly flavoured, and excellent both for eating and culinary uses: ripe about autumn, and continues till the end of December.

Royal Russet.] A fine, large, roundish-oblong, deep-russet-coloured, rough Apple, having a soft, yellowish pulp, of a mild flavour, and is admirable for all culinary uses in particular; is in perfection from October or November until April.

Embroidered Apple.] A moderately-large, beautiful Apple, adorned with broad red stripes; is a middling fruit, both for eating and kitchen purposes, and is in perfection in winter.

Wheeler's Russet.] A middle-sized, roundish-flattened, russet-coloured, and yellowish Apple, having a firm, brisk, agreeably relished pulp, both for eating and culinary uses, and is in perfection all winter and spring.

Pile's Russet.] A smaller, middle-sized, oblong-oval Apple, russet-coloured on one side, green on the other, having a very firm flesh, of a sharp acid relish; is by some esteemed for eating, but is in high repute for baking, con-

tinuing in perfection all winter, until April or May.

Stone Pippin.] A pretty large, whitish, very hard Apple, having a sour unpleasant pulp eaten raw, but is in good estimation for baking; is in perfection all winter, spring, and great part of summer.

Barnard's Baking Apple.] A very large, fine, baking Apple, in perfection in winter, and keeps good till summer.

Kitchen Rennette.] A large, handsome, whitish Apple, in high repute for all culinary uses: in perfection all winter.

The above varieties being the most approved sorts, they are cultivated in most of the nursery-gardens for sale.

The following are less material varieties of eating and culinary Apples mentioned in some fruit catalogues,—Summer Russet, a roundish, russet-coloured Apple—Summer Pippin, a roundish yellow Apple—L'Api, a small bright-red Apple—Transparent Apple, having a pellucid pulp—Virgin Apple, long and beautifully red—Anise Apple, longish, and flavoured like aniseed—Gilliflower Apple, middle-sized, and delicately reddened—Salmon Apple, longish, red, and yellow fruit—Margil Apple, middle-sized, ridged, and red-striped—Kirton Pippin, roundish, whitish-green, and often cracked—Lemon Pippin, small, roundish, yellow fruit—Aclemy Russet, a roundish, russet-coloured Apple—Gray's Pippin, large, roundish, grey, and green Apple—Winter Greening, a very large green Apple—Black Pippin, a large dark-green Apple—Partridge Apple, a large kitchen Apple—Lord Hlay's Pippin, a middling roundish Apple—Spencer's Pippin, a middling, round, brownish and yellowish-green Apple—Winter Pippin, a roundish firm Apple—Costard Apple, large, irregular, and red striped—Winter Rambourg, a large, round, red Apple—Cat's-head Apple, very large, for culinary uses. Of the above, the first five or six sorts are forward Apples, and all the others are autumn and winter fruit, and most of which may be used occasionally for eating and kitchen uses.

And of Cider Apples, the following are the principal sorts—Redstreak Apple—Royal Wilding—Everlasting Hanger—Gennet Moyle—Whitfour Apple—John Apple—Woodcock Apple—Herefordshire Underleaf—which, with many others, are well known in the cider counties, as Devonshire, Herefordshire, &c.

To the above lists may also be added the following varieties, being all off-spring of *Pyrus Malus*.

Fig Apple.] Having been formerly supposed

that the trees produced fruit without any previous visible flower, like the Fig-tree, it obtained the name *Fig Apple*; but the fact is, the tree certainly produces flowers, that are visible, which, however, are almost apetalous, or without petals, so are not conspicuous like those of the other varieties, but are, nevertheless, furnished with the generative organs, succeeded by proper fruit.

Paradise Apple.] A low weak-shooting tree, of a shrub-like growth, produces small fruit of no value, so is retained in some gardens for variety, and is sometimes used as stocks on which to graft other Apples, to render them of a very dwarfish growth, both sometimes for espaliers and walls, or principally in small dwarf-standards, to plant in borders, and for small gardens, and for planting in pots for curiosity.

Dutch Paradise Apple.] Grows a little stronger than the former, and is often used for stocks to graft upon to form dwarf-trees; as in the last-mentioned.

Wilding, or Crab Apple.] The tree grows more than twenty feet high, producing small, roundish, and oblong yellow fruit, intolerably sour, harsh, and disagreeable to the taste, so are used only principally for making verjuice. The trees of this variety grow wild in England, &c. in woods and hedge-rows, and are rarely cultivated in gardens, except for stocks on which to graft the cultivated Apples; for which purpose they have great merit, as trees grafted on Crab-stocks are generally very hardy and durable; sometimes, however, a few plants are introduced in the shrubbery plantations for variety, and are employed by the farmers for making field hedges, as being of quick growth, soon run up, and form a hedge expeditiously. See HEDGES.

Thus far terminates our list of the varieties of this great species, *Pyrus Malus*.

There are, however, besides the above, many other varieties of less value; but those of the above list are the generally known approved sorts; all the varieties, good and bad, are the off-spring of this one species (*Pyrus Malus*), the trees of all the sorts having oval sawed leaves, and sessile umbels of flowers, appearing in April and May, upon short spurs on the sides and ends of the branches, succeeded by fruit soon after, growing to perfection, in different sorts, from July until the end of October, as before observed; those, however, that ripen before the middle of September, keep but a short time, some of the forwardest probably not above a fortnight, others a month, or but little more; but the winter kinds continue in succession several months, especially

if housed in dry, close apartments, and thickly covered with clean straw to exclude the free air, damps, and frost: and if a quantity of the latest are packed up close in baskets or boxes lined with straw, to exclude the air, they will continue sound and good till next summer.

The following species being also of the Apple kind, are retained in our gardens, some both for the production of their singularly small eatable fruit, esteemed a great curiosity; and for variety, and others principally for the latter occasion.

2. *PYRUS baccata*.

Berried-fruited Apple, commonly called Siberian Crab.] A small shrub-like tree, branching out low, growing about ten or twelve, to fifteen feet high, in the different varieties; garnished with oblong, equally-ferrated leaves, and crowded peduncles, with pale red flowers, succeeded by small berry-like Apples, of different varieties.

Varieties of this are,] Common small berry-shaped, yellowish and red fruit—Larger Apple-fruited, of different sizes, bigger or smaller in the different varieties of the trees—Small red berry-fruited; all of which varieties, though denominated crabs, are agreeable eating in autumn, and proper to serve to table in a dessert, both for variety, curiosity, and to eat.

(Americana) — American Berry fruited Crab.] A dwarfish tree, garnished with oblong, sawed leaves, and producing numerous small berry-like, red Apples; eatable when full ripe; sometimes served in the dessert for variety, and are estimable to use for preserves, &c.

3. *PYRUS coronaria*.

Sweet-scented Virginia Crab.] Grows ten or twelve to fifteen feet high, garnished with narrow, angulated, ferrated, smooth leaves; and pedunculated umbels of whitish, sweet-scented flowers; succeeded by many small round Crab Apples, remarkably sour and austere.

Variety.] Evergreen Virginia Crab.

4. *PYRUS spectabilis*.

Large-flowered Chinese Apple tree.] Grows twenty or thirty feet high, garnished with oval-oblong, ferrated leaves, and sessile umbels of large, semi-double, red flowers, singularly beautiful; succeeded by small Apple fruit, of but little value.

The above three last species of the Apple tribe are proper to cultivate, some both as secondary fruit-trees, for their production of fruit for occasional eating, particularly the Siberian Crabs, and to plant for variety in

shrubberies, borders, &c. and all the others are principally for variety in any pleasurable compartments; allotting the Chinese Apple tree a conspicuous situation, for its large beautiful flowers; though all the sorts deserve a principal situation, as they will effect a very agreeable variety in their growth, flowering, and fruiting.

However, as fruit trees, it is eligible to admit some of the different varieties of the Siberian and American Crab, disposed either in the borders of the kitchen or pleasure garden, or both, for the sake of variety, in the agreeable singularity of their curiously small apples; the trees also appear very ornamental in blossom, which is generally succeeded by a plentiful production of fruit, exhibiting an entertaining variety in the autumn season; and they may be trained both as espaliers, wall-trees, and small standards, and managed the same as directed for other apple trees.

All the above three species, and their respective varieties, are propagated by grafting, layers, and cuttings; and by all of which methods, the several varieties continued distinct in their respective peculiarities.

General Observations on the common Apple-tree.

The trees of all the varieties of the common Apple bear well in any mode of training, such as in espaliers, against walls, and all kind of standards; they however are rarely indulged with walls, as all the sorts of Apples attain full perfection without that aid, the walls being commonly reserved for such tender fruits as stand more in need of their assistance; in espaliers, however, it is eligible to have a collection of the choicer sorts, as in this mode of training the fruit generally attain greater perfection as to size, beauty, and flavour, than in standards; but all the varieties likewise acquire good perfection on standards of all sorts, though probably in a less degree in some particular sorts; and it is from common high standards that the general supply of Apples is obtained for common use, and for the supply of markets, making cider, &c.

In espaliers, the trees may either be arranged by themselves, or in assemblage with Pears, &c. alternately, to effect the greater variety, being generally arranged around the outer boundaries of the quarters of the kitchen-garden, in the borders verging the main walks; but some may also be arranged in any other department, either for the sake of variety or convenience. See ESPALIERS.

And in common standards they may be both disposed in ranges thinly in the garden, and formed into orchards, according to the supply

supply required; and in some places they are cultivated in hedge-rows of fields; and in the cider counties they plant them out both in hedge-rows, and in large fields, in wide ranges, to admit of having crops of corn, &c. between; but in common orchards they are planted about thirty or forty feet distance, and the ground is generally laid down in grass. See ORCHARDS.

Dwarf standard. Apples are sometimes raised, a few for variety or curiosity, or to plant in small compartments, or in borders, and for small gardens, as before intimated; and if properly trained, will bear in very great perfection, in quantity according to their size of growth. See DWARF TREES.

The mode of bearing of all the varieties of Apples is principally upon short spurs, issuing from the sides of the branches of from two or three to many years old, as observed of Pears and plums, &c. formed first towards the extremity of the two or three years' wood, then by degrees along the sides of the branches, provided the branches are always trained at full length, as advised for other trees that bear chiefly upon spurs, as shortening promotes luxuriance, and forces out numerous strong wood shoots in the place where fruit spurs would have been formed; but being trained always entire, they assume a moderate growth, and gradually emit natural spurs in every part; and as the same branches and spurs remain fruitful many years, determines, that in the general course of training and pruning these trees, we should not shorten their branches, except occasionally in the first and second year after grafting, if thought necessary, to force out lower laterals to give the head its first proper form; afterwards, permit the branches to extend generally at full length, both in espaliers, &c. and all manner of standards; and thus they will all soon form a bearing state.

Apple-trees often begin bearing at two or three years old, and at six or eight will bear in tolerable plenty according to their size.

Method of Propagation, &c.

All the varieties were first accidentally obtained by raising them from the kernels of the fruit; but we cannot depend upon seedlings to continue the same sort of fruit.

Grafting therefore is the mode of propagation to increase and continue the different varieties the same; performing it upon Crab, or any kind of Apple-stocks, raised from the kernels, both for dwarfs and standards; also upon Codlin and Paradise Apple-stocks raised from cuttings and layers, when designed to have espaliers and other dwarf trees, or for small standards, as low as possible, to be con-

finied within a moderate space, or for small gardens; some sorts of Apples may also be raised by layers and cuttings, particularly the common Codlin, which may likewise be raised from suckers, from the root and stem of such trees that are wholly of the Codlin kind quite from the root; and as this tree is of very moderate growth, it is commonly trained in small standards of two or three, to four or five feet stems, branching out above in full, but not in large heads; however, the best general method of propagating all the other kinds of Apples is by grafting upon the proper stocks, as aforesaid.

The method of raising the different sorts of stocks for the above purpose is,—the Crab and Apple-stocks are raised from the kernels of the fruit; but the Codlin and Paradise-stocks must be raised by cuttings and layers, to continue them with certainty of the same kind and moderate growth; however, as to the Crab and Apple-stocks, they may be raised from the kernels of any of the sorts, procuring the kernels in autumn or winter, either from rotted fruits, &c. or from such as have been pressed for verjuice and cider, clearing them from the grossest of the pulp; then sow them in beds of light earth, moderately thick, either all over the bed, or in drills, covering them about an inch deep; they will come up in the spring, when, if the season proves dry, water them occasionally, which will greatly forward the seedlings and strengthen their growth; and in autumn, winter, or spring following, the largest may be planted out in nursery rows, previously shortening their tap-roots, and planting them in lines two feet and a half asunder, to remain for grafting; and after having from one to two or three years' growth here, they will be fit for grafting, particularly for dwarfs, or even for full and half standards, if intended to form the stem from the graft, which is an eligible method for these trees; but if the stock is to form the stem, they will require three or four years' growth, to rise to a proper height, seven feet for full, and four or five for half standards.

The work of grafting all the sorts is the same as for other fruit trees, and should be performed in March, either by whip-grafting, cleft-grafting, &c. according to the size of the stock. See GRAFTING.

Having, however, provided proper grafts of the different sorts of Apples you intend to propagate, then let those stocks designed for dwarfs of all sorts be grafted within six inches of the ground; and standards may also be grafted low, and one shoot from the graft trained up for a stem, or may be grafted on tall

tall stocks, inserting the grafts at five or six feet high: or for low and half standards, may be grafted at two or three, to four or five feet; or lower for dwarf standards: but always graft the most abundant in full standards, for the principal general bearers: the grafts of all the sorts will shoot the same year; and by the autumn following, the trees having formed little heads, consisting of two, three, or four shoots, may then be transplanted finally into the garden and orchard, or may be retained a year or two, or longer, in the nursery, as occasion may require; observing, however, to train them for the purposes intended, such as dwarfs for espaliers, &c. &c. and uprights for standards, heading the dwarfs down in March following, within six inches of the graft, to force out more laterals below to form a fuller head, proceeding immediately near the bottom, so as to fill the espalier, &c. equally with branches, quite from within six or eight inches of the ground, regularly upward. But as to standards, those grafted low must consequently be trained with one shoot upright, at full length, for a stem, five or six feet high at least, for full standards, before it is topped; though if grafted on tall stocks of height sufficient for a stem, the shoots from the graft may either be headed to five or six eyes, if you would have them form a more spreading head, or may remain entire, and aspire more in height, and assume a more upright growth: in all the modes of training, be careful to keep the stems clear from all lateral shoots, displacing all such as soon as they appear, and encourage only a proper set of branches at top to form the head.

When these trees, however, have heads from one to two or three years old from the graft, they are of a proper age for final transplantation; though trees of four or five years old will also succeed very well, and even trees of six or eight years' growth may also be safely transplanted if required; but younger trees generally grow better and make more progress in the end.

The public nursery-gardens are generally well furnished with all the varieties of these trees for sale, either quite young from the graft, or trained trees of several years' growth, at very moderate prices.

In the choice of the different kinds for planting, should be careful to have a collection of the principal varieties, both in espaliers and standards, in quantity in proportion to the extent of ground in the garden, orchard, &c. as the trees of the best sorts are as easily raised and cultivated as the most indifferent; allotting generally a smaller portion of the summer

kinds, such as ripen in August, to about the middle of September, for immediate use off the trees, as they will not keep long; a larger supply of the autumn sorts, and most of all of the principal winter keeping Apples: observing, in the summer kinds, it is advisable to allot a principal supply of the common Codlin in small standards, as being generally both a great bearer, and the fruit the most useful of the summer apples for culinary purposes, from its young green growth in June or July, till its full maturity in August and September, when it becomes also a good eating apple: and as the tree is a moderate grower, it admits of being planted in small standards closer or more abundant in a small extent of ground than most of the principal Apple kinds.

The season for planting all the sorts of Apples is any time in mild weather, from the end of October till March; but if planted in autumn, or early in winter, they will fix themselves more firmly before attacked by the drought of the following summer.

They will succeed in any common soil of a garden and orchard, and in any free situation, except in low very moist land, in which they are apt to canker, and soon go off: in a pliable mellow loam they are generally very successful: be, however, in no great anxiety about the soil; any good or common middling soil of a garden, orchard, or field, not too wet, will do very well, being properly prepared, by good trenching, where the ranges of trees are to stand.

First of planting them in Espaliers.

Espalier Apple-trees should be ranged at not less than eighteen or twenty feet distance; but if twenty feet, it will be more eligible, especially for trees grafted on crab or Apple-stocks, which being free shooters, their branches will readily fill that space. However, as to trees grafted on codlin and paradise-stocks, fifteen or eighteen feet may be a sufficient distance; though the latter, in particular, is sometimes planted only twelve or fifteen feet asunder, as being a very moderate shooter: it is, however, advisable to allow every sort full room enough, according to their growth, to have proper space to extend their branches always at full length; observing, as the trees having been headed down in the nursery, and thereby produced laterals forming tolerable heads of several regular branches, they should now be planted with all their said heads entire, only retrenching any very irregular growth, that do not range consistent with the intended form, and prune any broken roots; then having opened a capacious hole for each tree at the above distances, proceed

to plant them in the usual manner as explained in the article *Planting*, being careful to place them with their branches ranging the way of the espalier: then, or at least, as soon as the earth of the holes and roots together are properly settled, let all the branches be trained in horizontally to the right and left, an equal number on each side, all at full length, five or six inches asunder; or if the tree is young, having only two or three shoots, these should be pruned down half way in the spring, to obtain a further supply of laterals; and according as they shoot in summer, still continue them along entire; at the same time train in a farther supply of new shoots, to increase the number of horizontals or bearers; and thus continue increasing their number, every year, till the espalier is regularly filled from the bottom to top; preserving all the branches at full length, as far as the allotted space will admit, for the reasons before explained, both here and under the article Pear; for these and the Pear-tree require almost exactly the same management.

With respect to their general culture, in espalier trees, planted and trained as above; observing, that as the same branches or bearers continue fruitful many years, they must be continued accordingly, as long as they remain of proper growth; and observing in this order of training, they must constantly have a summer and a winter pruning annually: in the summer-pruning cut out all the superfluous and ill-placed shoots of the year, and train regular ones towards the lower parts in vacant spaces, if any; at least, retain a supply of some best, well-placed shoots in different parts to remain till winter, some of which may be then wanted to fill some unforeseen vacancy; clearing out all others at this time (summer-pruning) as close as possible. And in winter-pruning examine the branches in general, if any worn-out or decayed parts appear, now is the time to retrench them, retaining young in their place; and if any vacancy occur, retain some contiguous young shoot to fill it: and as observed of the pears, &c. leave generally a terminal shoot, less or more, to each main branch: all others of the young shoots of last summer, not now wanted, cut clean out, close to the branches, still continuing all the branches, and any occasional supply of shoots, at full length, as far as their limited bounds will allow; then train the whole regularly, tying or nailing them in as straight and close to the railing as possible, four, five, or six inches asunder.

Likewise in wall-trees, any of the principal choice varieties of eating apples may be

trained, both to forward and improve the growth, beauty, and flavour of the fruit; such as gennetings—margaret apple—golden-pippins—golden-reinets—pear-mains, &c. or any other approved eating kinds, a tree or two of a sort, where there is plenty of walling to spare; and in which they may be planted and trained as directed for the espalier apples; and they will bear a plentiful production of good fruit accordingly for earlier eating; especially if some are against a south or south-west or east wall.

As the Apple and Pear-tree are nearly of the same temperature, manner of growth, and mode of bearing, they require the same culture; and having treated more fully on the Pears in respect to pruning in walls and espaliers, which for the general part may be applied to Apples, we refer to that article for particulars. See *PYRUS Communis*, PRUNING, and ESPALIERS.

In the article Pear-tree, we gave some hints of another method of training in espaliers or for walls, which may also be applied to Apples if any one incline to put it in practice for variety.

Planting them in Standards.

Standard Apples may be planted both in the garden and orchard: in the garden, however, they should be arranged but thinly, to admit of undercrops growing freely without interruption by the shade of their spreading branches.

Observe to plant principally full standards for the general supply, and half and dwarf standards chiefly for variety, or for small gardens.

The standards having been trained in the nursery with tolerable good heads, they should now be planted with all their heads entire: if any are intended for the kitchen-garden, plant them at least thirty feet distance; and for a full plantation to form an orchard, allow thirty feet distance every way. Open for each tree a wide hole, trim any long straggling and broken roots, but leave all the others entire, and plant them with the usual care, as directed in the article *Planting*; and as soon as planted, let every one be well staked to support them firmly upright, and prevent their being disturbed in rooting by tempestuous winds. See ORCHARD and PLANTING, &c.

Smaller growing standards, such as codlins, or other low standards grafted upon codlin stocks, and dwarfs upon these or paradise stocks, may, if required, be planted only at fifteen or twenty feet distance in the rows, and not less than twenty or twenty-five feet between the lines of trees; though, if there is room

room to allow a greater distance both ways, it will be the greater advantage, especially in planting in kitchen gardens, in which it would be proper to allow double that distance between the rows of trees, of the larger growths of these kinds.

The standards being thus planted with their heads entire, let them also in future advance with all their branches at full length, and, for the general part, take their own natural growth; and they will soon form numerous natural spurs in every part for bearing.

With respect to pruning these standards, very little is required, and that probably not once in several years, which is only the retrenching any very irregular cross-placed bough, or reduce to order any very long rambler; or when the head is become greatly crowded and confused, to thin out some of the most irregular growth, likewise all strong shoots growing upright in the middle of the head, all dead wood, and suckers from the stem and root.

As to half and dwarf standards of these trees, they may be dispersed in different parts of a garden to cause variety, managing them as the full standards; they will bear plentifully.

Dwarf standards on the dwarf paradise stock, being very moderate shooters, may be planted in a little compass; and they are sometimes planted in pots for curiosity, to place on a table, amidst a dessert, with the fruit growing. See DWARF TREES.

Gathering the fruit.

Apples arrive to full growth in different sorts successively, one after another, from July until the end of October; the summer kinds continue but a short time, but the autumn and winter-apples will keep from two or three to six or eight months, in different varieties.

The summer Apples ripen, some in July, but principally in August and September, and are generally fit for use immediately from the tree, both for eating and culinary uses, though some of the sorts are fit for kitchen purposes by that time they are half grown, or before, particularly the common Codlin, which boils and bakes in good perfection when quite young, and until full maturity; however, the tokens of perfection, or full growth, of the different sorts of summer Apples, is by their assuming a lively colour, emitting a fragrant odour, frequently falling from the tree, and by quitting their hold easily on being handled. They should then be gathered, and laid in some dry apartment for use; they will not keep long, nor indeed is it required, for they will be succeeded

by much better in the autumn and winter kinds.

Autumn Apples arrive to maturity in different sorts, from about the middle of September till the beginning and middle of October: some being fit for use immediately from the tree, others require to lie a few weeks to mellow, especially for eating: their full growth on the tree is known in some by their changing of a more lively colour, sometimes imparting an agreeable smell, frequent dropping, and on being handled, by a gentle twist or turn upward, they readily quit the tree; at which tokens of maturity, as they occur in the different sorts, they should be gathered in dry weather, and carried into the fruitery, where, with proper preservation, hereafter noticed, they will keep a long time, succeeding one another for use two or three months, or longer, in the later kinds.

Winter Apples attain full growth towards the middle to the latter end of October; it is, however, proper to let them hang on the trees till towards the end of that month, or some of the latest kinds even till November, if the season continues mild: but be careful to take them down before attacked by much frost; gathering them in dry weather, and carry them directly into the fruitery or any dry apartment, and there prepared for keeping as hereafter directed, whereby some may be kept sound and good for use till next June or July.

In gathering all the sorts of Apples for keeping, always chuse dry weather, and when the trees and fruit are also perfectly dry; observe likewise in gathering Apples for the table, and all kind of Apples designed for keeping any considerable time, they should be pulled one and one by hand. Where, indeed, large quantities are designed for cider, or any other immediate use, they may be shaken down. However, all the fine eating and culinary Apples for keeping should be carefully gathered by hand, by a gentle twist or turn upward, so as to detach them readily without breaking the fruit-buds; and as they are gathered, carry them into the fruitery, &c. where, previous to putting them up for good, it will be proper to lay the choicer varieties of autumn and winter kinds in large heaps, to sweat and discharge the watery juices by perspiration, which both prepares them for keeping and improves their flavour; then, after having sweated a week or fortnight, wipe them all perfectly dry, and lay them up where they are to remain. A quantity may be deposited on the shelves and floor of the fruitery, and closely covered down a foot thick with

straw to exclude the air. And it is proper to pack a quantity of the finest winter kinds in large baskets or hampers, thickly lined round within with straw, covering the fruit down also closely with the same material, to exclude the external air as much as possible, whereby they will keep much longer in perfection; and if some are packed up in large earthen jars, and closely plugged down, they will keep longer still; for it is by these methods that the fruit is kept so fine and fair even until the return of Apples next year; observing, the drier and closer the room in which the fruit is deposited in all the above methods, the better they will keep; being careful to examine the fruit occasionally, in order to pick out all that discover any tendency to corruption; those in the open fruiteries are easily looked over, but those in the baskets and jars not so readily, nor indeed will they need it so much; however, it is proper, after some considerable time, to examine them occasionally.

In London, great quantities of the finest winter Apples are deposited in the proper season in the close warehouses in Thames-street, and other parts contiguous to the river, for sale in winter and spring, many also packed closely in hampers and baskets, &c. as aforesaid, and placed in very close apartments where but little air can come; where they are kept perfectly sound and beautiful all winter, even until May, June, and July, selling them out to the retailers, and we may see them in the fruiterers' shops, and in stalls in the streets, exceeding fine in May and June; but, at this time, after being exposed to the open air a day or two, they shrink, lose colour, and soon decay.

It should therefore be remarked, that close packing these fruit, and keeping them in as close apartments as possible, keeping the doors and windows always closely shut to exclude the external air, damps and cold, is a certain method of preserving them long in full perfection; for the more they are exposed to the air, the sooner they will decay; keep them therefore always as close as possible.

Quince kinds.

Pyrus Cydonia, Quince-tree.

The Quince-tree (*Cydonia*) was long ranged as a distinct genus, but is now a species of *Pyrus*. It is of the tree kind, of moderate growth, and deciduous; producing large, round, golden-yellow fruit, of a high fragrance; but generally too austere and harsh to eat raw, being employed principally for culinary purposes.

Class, order, and characters, the same as the Pear, &c. (*Pyrus Communis*.)

There is but one species, viz.

Pyrus Cydonia.

(*Cydonia*)—or *Quince-tree*.] Grows ten or twelve feet high, having slender branches and shoots, forming a low moderately spreading head, garnished with large, oval, entire leaves, very hoary underneath, and large, solitary, whitish-red flowers all along the sides of the branches, succeeded by large, round and pyramidal, golden-yellow fruit.

The botanic description is,—*Pyrus* with entire leaves and solitary flowers.

Varieties.] There are several varieties of this fruit, but the following are the most valuable sorts.

Apple-Quince.—A large, short, roundish, apple-shaped, golden-yellow Quince.

Pear-Quince.—A large, pyramidal, or pear-shaped, deep-yellow Quince.

Portugal Broad-leaved Quince.—The tree is of larger growth, and with broader leaves; pear-shaped fruit, having a tenderish pulp, which bakes and boils to a fine purple colour.

Eatable-Quince.—A middle-sized downy Quince, having a tender pulp, of a milder eatable flavour than the others; more especially when prepared by baking, stewing, &c. to serve up whole.

Most of these fruit, though remarkably beautiful to the eye, are too harsh and unpalatable to eat raw; their chief uses being for baking and stewing, to make marmalade, and to mix in apple pies, tarts, &c. to improve the flavour.

The trees, however, merit culture in every curious collection, some for the fruit, and others for ornament; but considered as fruit-trees, a few are sufficient to produce fruit enough to supply a large family, and may be trained both in standards and espaliers to effect the greater diversity; and as ornamental trees, they are eligible furniture for the shrubbery, &c. their numerous large flowers and golden fruit will effect a delightful variety; the flowers in spring, and the fruit in autumn. Young Quince-trees are also in repute for stocks, on which to graft and bud Pears, to dwarf them for walls and espaliers. See *Pyrus Communis* and *Stocks*.

They are very hardy, and will grow anywhere, but delight most in somewhat moist situations, and are therefore often planted by the sides of ponds or ditches of water.

Method of Propagation, and general Culture.

The trees may be raised from the kernels of the fruit sown in autumn; but there is no depending

depending on having the same sort of good fruit from seedlings, nor will they soon become bearers.

But the several varieties may be continued always the same by the propagation by cuttings and layers; also by suckers from such trees as grow upon their own roots, and may likewise be propagated by grafting and budding upon their own or Pear-stocks raised from the kernels.

The propagation by cuttings, layers, and suckers, may be performed in autumn, winter, or spring. Chuse young wood for the cuttings and layers, which plant and lay in the common method, and they will be rooted by next autumn, then transplanted into nursery rows two feet asunder; plant the suckers also at the same distance, and here train the whole for the purposes intended: if for standards, run them up with a stem, to any desired height, from three to five or six feet, then encourage them to branch out at top, to

form a head; and those designed as dwarfs must be headed near the ground, and trained accordingly for espaliers, or dwarf standards, as may be required, as directed under those articles, and by grafting or budding is effected on Quince or Pear-stocks, and trained as above.

When they have formed tolerable heads, plant them out finally.

Standard Quinces, designed as fruit-trees, may be stationed in the garden or orchard, and some by the sides of any water, pond, watery-ditch, &c. as they delight in moisture, suffering the whole to take their own natural growth.

And as espaliers, they may be arranged in assemblage with other moderate-growing trees, such as Apples and Pears on Paradise and Quince-stocks, Cherries, &c. and train them as directed for Apples and Pears in espaliers.

In shrubberies they may be planted either as full or low standards, and permit them to take their own way of growth.

Q.

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Q U E R C U S, Oak-tree.

This famous genus comprises a noble collection of most eminent forest and ornamental trees, both deciduous and evergreen kinds, obtaining in stature from twenty to near a hundred feet, in different species, garnished with oblong and mostly sinuated leaves, and monœcious apetalous flowers, of little appearance, succeeded by oval nuts, called acorns.

Class and order, *Monœcia Polyandria*.

Characters.] CALYX, male and female, flowers separate on the same plant; the males disposed in loose amentums, each floret having a monophyllous four or five-parted calyx; and the females sitting close to the buds, have monophyllous, hemispherical, coriaceous, rough, entire cups. COROLLA, no petals. STAMINA, many short filaments in the males, having didymous antheræ. PISTILLUM, a small oval germen in the females, quinquedid styles, and simple permanent stigmas. PERICARPUM, none; the seed, an oval nut or acorn, with a leathery unilocular shell, is fixed by its base into the calyx.

There are about fourteen species in our

nurseries and plantations, nine deciduous, and five evergreen kinds; but the *Common English Oak* is the glory of the collection, for its superior growth, and great worth and value, as a timber-tree, for bulk, strength, and duration. Several of the other species have also their share of merit, some as forest-trees, others to diversify ornamental plantations.

Deciduous Kinds.

Under this head, Deciduous Oaks, is comprised the common Oak of our woods and forests, and several species of North America, and some foreign parts of Europe, as France, Spain, Portugal, and Italy, as expressed in their titles; all of which are of the tree kind, deciduous, and of hardy growth.

I. QUERCUS Robur.

Common English Oak.] Grows from about sixty or seventy to a hundred feet high, with an exceedingly large trunk, and monstrous spreading head, oblong leaves, broadest towards the top, the edges acutely sinuated, having the angles obtuse.

Varieties.] Striped-leaved Oak, having the leaves finely striped with white.—Dwarf Oak.

This species grows in great abundance all over England in woods, forests, and hedge-rows; is naturally of an amazing large growth, there being accounts of some above an hundred feet stature, with wonderful large trunks and spreading heads, and is supposed will continue its growth many centuries.

2. *QUERCUS Prinus.*

Chestnut-leaved American Oak.] Grows fifty or sixty feet high; having large, oblong-oval, smooth leaves, pointed both ways, the edges sinuated-serrated, with the sinuses uniformly round.

Varieties.] With oval leaves—with oblong leaves.

3. *QUERCUS Phellos.*

Willow-leaved American Oak.] Grows forty or fifty feet high, having long, narrow, smooth, entire leaves like those of willow.

Varieties.] Dwarf Willow-leaved Oak, with short leaves—variable leaved.

4. *QUERCUS alba.*

White Virginian Oak.] Grows thirty or forty feet high, having a whitish bark, long, obliquely-pinnatifid, light-green leaves, the sinuses and angles obtuse.

5. *QUERCUS nigra.*

Black Virginian Oak.] Grows thirty or forty feet high, having a dark-coloured bark, large, wedge-shaped, slightly-trilobated leaves.

6. *QUERCUS rubra.*

Red Virginian Oak.] Grows about sixty feet high, having a dark-greyish bark, long obtusely-sinuated leaves, with the sinuses terminated by bristly points, and have sometimes red spotted veins, but generally dying in autumn to a reddish colour, remaining on the trees late in the season.

Varieties.] With broad leaves—with scarlet leaves.

7. *QUERCUS Esulus.*

Cut-leaved Italian Oak.] Grows about thirty feet high, having a purplish bark, oblong, deeply-sinuated-pinnatifid, smooth leaves, and long, slender, close-fitting acorns in very large cups.

8. *QUERCUS Ægilops.*

Large prickly-cupped Spanish Oak.] Grows seventy or eighty feet high, or more, with a very large trunk, and widely spreading head, having a whitish bark, large, oblong-oval, deeply-serrated, smooth leaves, the serratures repand and bowed backward, and large acorns placed in singularly large prickly cups.

This is a noble species, almost equal in growth to our common English Oak.

9. *QUERCUS Cerris.*

Smaller prickly-cupped, or Turkey Oak.] Grows thirty or forty feet high, oblong, lyr-

shaped, pinnatifid-transversely-jagged leaves, downy underneath, and smaller acorns, placed in prickly cups.

Varieties.] With rough leaves—with narrow leaves.

All the above species of deciduous Oak may be cultivated both as forest-trees and in diversifying large ornamental plantations; as timber or forest-trees, however, is their principal merit, but the English Oak claims the preference for general use, as the most valuable for timber; and should raise a greater quantity of it accordingly.

They are all easily raised from seed, i. e. the acorns, sown in the autumn an inch or two deep. See their *Propagation*.

Evergreen kinds.

Of evergreen Oaks there are five species—Common evergreen Oak—Holly-leaved Oak—Cork-tree—Scarlet Oak—and Moluccan or Live Oak; some as timber-trees, others for ornament, all of which retain their leaves the year round; are originally of foreign growth, mostly from the southern parts of Europe, and one from America, but have been long in the English gardens as ornamental trees, and some are arrived to a considerable growth, they being all very hardy, and prosper in any open ground.

10. *QUERCUS Ilex.*

Common Evergreen Oak.] Grows forty or fifty feet high, having a smooth bark, oval and oblong, undivided, denticulate-serrated, petiolated leaves, downy and whitish underneath.

Varieties.] Broad-leaved.—Narrow-leaved, and with sometimes both sorts, and other different shaped leaves on the same tree; also sometimes with sawed and prickly leaves.

11. *QUERCUS granuntia.*

Montpelier Holly-leaved evergreen Oak.] Grows forty or fifty feet high; oblong-oval, close-fitting, sinuated, spinous leaves, downy underneath, bearing a resemblance to the leaves of holly.

12. *QUERCUS Suber.*

(Suber)—or Cork-tree.] Grows thirty or forty feet high, having a thick, rough, fungous, cleft bark, oblong-oval, undivided, serrated leaves, downy underneath.

This species furnishes that useful material Cork; it being the bark of the tree, which becoming of a thick fungous nature, under which, at the same time, is formed a new bark; and the old being detached for use, the tree still lives, and the succeeding young bark becomes also of the same thick spongy nature in six or seven years, fit for barking, having likewise another fresh bark forming under it, becoming

becoming Cork, like the others, in the like period of time; and in this manner these trees wonderfully furnish the Cork for our use, and of which are made the corks for bottles, bungs for barrels, and numerous other useful articles.

The tree grows in great plenty in Spain and Portugal, and from which countries we receive the Cork.

13. *QUERCUS coccifera*.

Scarlet-bearing, or Kermes Oak.] Grows fourteen or fifteen feet high, branching from the bottom upward, in a bushy growth; large, oval, undivided, indented-spinous leaves; and producing small glandular excrescencies, called kermes or scarlet grain, used by dyers.

The small scarlet glands, found on this tree, are produced by the effect of certain insects depositing their eggs betwixt the bark of the branches and leaves, causes an extravasation of the sap, and forms the excrescence or substance in question, which being dried, is the kermes or scarlet pastel.

14. *QUERCUS molucca*.

Molucca Oak, commonly called American Live Oak.] Grows about forty feet high, having oval-spear-shaped, smooth, entire leaves, and small, oblong, eatable acorns.

All the above fourteen species of *Quercus* produce flowers annually in the spring, about April and May, of a yellowish colour, but make no ornamental appearance, and are males and females separate in the same tree; the males being in loose amentums, and the females sitting close to the buds in thick leathery hemispherical calyxes, succeeded by the fruit or acorns, which are oval nuts fixed by their base into rough permanent cups, mostly sitting quite close, and some on short foot-stalks, ripening in autumn, which in the common English Oak is in great abundance, and often in tolerable plenty on some of the other sorts; those of all the kinds serve for propagating their respective species; they are also excellent food for swine and deer, the common Oak in particular from its great abundance.

Oak-trees, of all the above sorts, may be employed in gardening, to diversify large ornamental plantations in out-grounds, and in forming clumps in spacious lawns, parks, and other extensive opens; the evergreen kinds in particular have great merit for all ornamental purposes in pleasure-ground plantations.

But all the larger growing kinds, both deciduous and evergreens, demand esteem also as first-rate forest-trees for their timber: the *English Oak*, however, claims precedence as a timber-tree, for its prodigious height and bulk; and superior worth of its wood, and is

supposed will stand one thousand years before it totally decays, so is singularly valuable for all strong and durable purposes, such as ship-building, some parts of house-building, park-paling, posts, railing, and innumerable other uses. But all the other large-growing Oaks may likewise be introduced in forest tree plantations; for Oaks in general prove valuable timber, and of all others the most durable; and besides their value as timber-trees, their annual crops of acorns prove most excellent food for fattening hogs and deer; and when the trees are felled for use, their bark, being stripped off, proves a most valuable material to the tanners for tanning leather; and after having served that purpose, is of great use in gardening for making bark hot-beds, commonly called bark-beds, being the most eligible kind of hot-beds for the culture of the pineapple, and all other tender exotics of the hot-house temperature. Oaks, therefore, being of such superior value, every possessor of considerable estates ought to be particularly assiduous in raising woods of them, which is effected by sowing the acorns either in a nursery, and the plants transplanted where they are to remain, or sown at once in the places where they are always to stand. See their *Propagation, PLANTATIONS, and FOREST TREES*.

All the sorts will prosper in any middling soil and open situation, though in a loamy soil they are generally more remarkably prosperous; however, there are but few soils in which Oaks will not grow; they will even thrive tolerably in gravelly, sandy, and clayey land, as may be observed in many parts of this country of the common Oak.

Their Propagation and general Culture.

Oaks in general are raised from the acorns, which, of the common Oak, are produced abundantly all over England, and should be gathered in autumn when quite ripe, just as they drop from the trees; but the acorns of most of the foreign oaks are generally procured from abroad; and those of all the species are sold by the seedsmen.

Observe to sow all the sorts as soon after they are obtained as possible, because they are apt to sprout if they remain long out of the ground. Prepare for their reception a spot of light ground in the nursery, dividing it into four-feet wide beds, and in which sow the acorns, either in drills two inches deep, in five or six rows, lengthwise the bed, or rake the mould off the bed, the depth of two inches, into the alleys, then sow the acorns all over the surface, about two or three inches apart, press them down with the spade, and spread the

the earth evenly over them two inches thick.

They will come up in the spring; give them occasional waterings and weeding, and when the plants are one or two years old, it is proper to plant them out in nursery-rows: this may be done in autumn, winter, and early in the spring, taking them carefully up out of the seed-bed: shorten their perpendicular tap-root, and trim off any lateral shoots from the stem, leaving their top perfectly entire; then plant them in lines two feet and a half asunder, and fifteen or eighteen inches in the rows, where let them stand, with the usual nursery care, till of a proper size for final transplantation, either as forest-trees, or some for ornament, training them up as full standards, with clean straight stems, and with their tops still entire.

Remark, the propagation of the striped-leaved varieties of the common Oak, and any particular variety of the other species, must be effected by grafting, as they will not continue the same from seed; so the grafting may be performed upon any kind of Oakling-stocks raised from the acorns, and train them for standards like the others.

Transplanting them finally.

All the sorts of deciduous Oaks may be transplanted any time in open settled weather, from the fall of the leaf in November, till February or March, and the evergreen kinds, in October, November, and in the spring; or in a mild open season, may be occasionally planted in any of the winter months.

When the trees of all the sorts are from about three or four to six feet stature, they should be planted out for good, though, considered as forest or timber-trees in particular, it is more eligible to plant them out finally whilst they are quite young, not advanced above from two to three or four feet in height; or if planted immediately from the seed-bed, where they are finally to remain, it may prove a greater advantage, as the quite young Oaks root more freely than older trees, and take a freer growth.

However, in this final transplantation, observe to plant those designed as forest or timber-trees, in large open tracts of grounds to form woods, placing them in rows only four or five to ten feet asunder, and two or three to five or six feet in the rows, to allow for a gradual thinning. See PLANTATIONS and PLANTING.

Sometimes, however, large plantations of these trees, for woods, are raised by sowing

the acorns at once in the places where they are to remain, as formerly noticed; it being generally observable in many instances, that the trees, raised at once from the acorn, receiving no check by removal, much outstrip the transplanted trees in growth. The method is this; the ground being prepared by good ploughing and harrowing, then, in autumn, having procured a proper quantity of acorns, draw drills across the ground four feet asunder, and two inches deep, drop the acorns therein six or eight inches asunder, allowing for some failing and thinning hereafter, covering them in evenly with the earth the depth of the drills; or instead of drilling them in, they may be planted with a dibble, the same depth and distance.

As to the general management of these trees in woods or timber plantations, it is the same as directed for forest trees in general, under the article PLANTATION, which see.

In planting any or all the species of Oak, for ornament or variety in large pleasure-grounds, some may be disposed in assemblage in any continued plantation, some in clumps, and others as single objects.

QUINCUNX Planting.

The Quincunx order of planting signifies trees planted by fives, four of them forming a square, and the fifth placed in the middle,

thus * * and may be repeated over and * *

over in one continued plantation, with as many trees in several ranges as thought proper, and was formerly a fashionable mode of planting groves and other regular plantations in the following arrangement:

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Somewhat of this mode of arrangement should generally be observed in the disposition of shrubbery plants, &c. though not in a regular Quincunx, but something nearly in this order, which both gives the shrubs a greater scope of growth, and they show themselves to greater advantage.

This mode of planting is also proper in the kitchen-garden, in transplanting many kind of esculent plants, such as lettuce, endive, strawberries, and even all the cabbage kinds, and many other plants; which gives them a greater scope to grow than if planted exactly square at the same distance.

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RACEMUS, a Cluster, or mode of cluster-flowering, being a long close Cluster of flowers or fruit, consisting of one common peduncle or foot-stalk, branching and supporting many short lateral ones all along its sides, these immediately sustaining the flowers and fruit: examples of a *Racemus* are bunches of grapes, and currants. See *VITIS* and *RIBES*.

RACER, or sward-cutter, a cutting implement used in racing out or cutting through the surface of grass sward, dividing it into proper widths, lengths, and thickness, for turf intended to be cut up for laying in gardens, and is always necessarily used preparatory to the work of flaying or cutting up the turf with the turving-iron.

It is a simple but useful tool for the above purpose; consisting of a strong wooden handle about four feet long, having the point-end of an old scythe for a cutter, fixed at the lower end, with the point and edge downward, to cut into the sward; the handle should be about an inch and half thick, growing gradually thicker towards the lower end, and somewhat bending or sloping at the bottom to rest on the ground, having at the bottom part a slit, to receive the cutter, which should be five or six inches long, placing it with the point and edge downward, as aforesaid, projecting an inch and a half out at the back of the bottom of the handle in a slanting manner, with the point inwards, fixing it firmly in that position, so as when pushed before you it may expeditiously cut the sward as you race it along.

Having this instrument, and proceeding to mark out on the sward the width of turf intended to be cut, which should be generally a foot wide and a yard long, and about an inch or inch and a half deep, straining a line tight, first lengthways, then strike the racer into the sward close to the line, run it along, it will expeditiously cut its way, and divide the sward to a proper depth; directly place the line a foot farther, and race it out as before, and so on to as many widths as may be wanted; and then with the line placed cross ways, race out the sward accordingly in yard lengths: being thus raced out, the turf cutter with his turving-iron proceeds to cut them up, and he

will flay them off at a great pace in exact widths and thickness. See *TURF*, &c.

RADIATUS flos, a radiated flower.—Such compound flowers as are furnished with a radius or spreading circumference. See *RADIUS*.

RADIUS, the Radius, or circumference, or outer spreading part of compound flowers, consisting of many flat florets set round the edge of the disk or middle, and spread out all around, resembling the figure of a radiant star, exemplified in *aster* or star-wort, marigold, sun-flower, and many others of the compound tribe, and of which there are both single and double flowers; the singles having only one series of florets in the radius, but the doubles have from two or three to many series, continued sometimes to the very centre. See *COMPOSITUS flos*.

RADICULA (from *Radix*) Radicle or Little Root, or small fibrous part issuing first either immediately from the seed, or that which terminates the stock or main root, penetrates into the soil, and draws nourishment for the production and support of the plant, and is the principal and essential part of every root of all vegetables.

RADIX, the Root, or lowermost part of a vegetable, situated within the ground, destined to draw nourishment from the soil for the production and support of all the other parts of the plant.

A Root consists of two parts, viz. 1. The stock or main Root (*Caudex*) that strikes downward into the earth, and puts forth radicles or fibres. 2. The radicle (*Radícula*) small thread-like roots or fibrous parts, terminating the stock or main Root, or proceeding from any part thereof, and is the principal or essential part of every Root, as it penetrates far into the soil, and attracts nourishment to the main stock, thence communicated to the stem, branches, and other parts of the vegetable.

From the various structures and directions of the stock or main Root, the botanists distinguish them by the following terms.

Perpendicular Root.] Descends in a straight line downwards. *Radix perpendicularis*.

Horizontal

Horizontal Root.] Runs in a horizontal or transverse direction along under the surface of the earth. *Radix horizontalis.*

Simple Root.] Such that is single and not subdivided.

Branched Root.] Divided into lateral branches, which also subdivide into ramifications. *Radix ramosa.*

Spindle-shaped, or tapering Root.] Is oblong, thick upwards, and tapers gradually to the lower extremity, such as common radish, carrot, parsnep, &c. *Radix fusiformis.*

Bulbous Root.] Roundish and oval swelling bulb, composed some of many succulent imbricated scales, others of many involving coats, and consist of three sorts: 1. Scaly bulbs, (*Bulbus Squamosus*) formed of many scales lying over one another, as in the lily. 2. Tunicated or coated bulbs (*Bulbus tunicatus*) formed of several tunics or coats closely involving one another, as in the onion, &c. 3. Solid bulbs (*Bulbus solidus*) as in tulip, *Radix Bulbosa.*

Tuberous Root.] A thick fleshy knob, formed of a solid lump, some roundish, others irregularly knobbed, and some oblong, composed either of one single knob, or several collected into bundles; examples of the tuberous-rooted tribe are the potatoe, Jerusalem artichoke, anemone, pæony, orchis, filipendula, and hemerocallis; the turnep, carrot, and parsnep, may also be considered of the same kind, and all other Roots that are formed of a thick, fleshy, solid substance. *Radix tuberosa.*

Fibrous Root.] Composed wholly of a number of radicles, or slender fibrous parts, and may be said to be the most common sort of Root, to numerous herbaceous plants in particular, and consists of perpendicular Roots, horizontal Roots, simple Roots, branched Roots; some being very thin and fine like threads, others somewhat fleshy, &c. *Radix fibrosa.*

Creeping Root.] Runs along just under the surface of the earth to a considerable length, emitting at certain distances small fibres below and shoots at top. *Radix repens.*

Globular Root.] Roundish, fleshy, solid Root of the tuberous kind, such as earth-nut, bulbous fumatory, &c. *Radix globosa.*

A grumous or bundled Root.] Composed of many small, oblong, fleshy, kernelly parts, or knobs, all connected at top, and terminated below in radicles or fibres, such as *Ranunculus*, &c. *Radix fasciculata.*

Granulous aggregate Root.] Consists of many small roundish knobs like grains of

corn, all clustered together, as in white saxifrage. *Radix granulosa.*

Pendulous clustered Root.] Composed of several fleshy, roundish knobs, or tubers, suspended, as it were, at the ends of fibres, as in filipendula, pæony, potatoe, Jerusalem artichoke, asphodelus, hemerocallis, &c. all of which are of the tuberous-rooted kind. *Radix pendula.*

Handed tuberous Root.] An oblong tuberous Root, dividing and spreading like an open hand, as in handed-orchis. *Radix tuberosa palmata.*

Testiculated Root.] Composed of two roundish tuberous knobs joined in a testiculated manner, as in some sorts of orchis. *Radix testiculata.*

Jointed Root.] Long, thickish, and jointed at certain distances. *Radix articulatus.*

Woody Root.] Becoming of a hard, tough, woody texture, such as the Roots of all trees, shrubs, and under-shrubby plants. *Radix lignosa.*

Tap Root.] Any main Root that runs straight downward in a perpendicular direction, like a carrot, parsnep, &c. and is often applicable to the tree and shrub kind, when the main Root runs directly downright; and in transplanting seedling-trees in the nursery, &c. it is occasionally recommended to shorten the Tap-Root, with a design both to prevent their penetrating too deep into the bad soil, and to force out horizontal or lateral roots, to extend horizontally nearer the surface into the good earth, where they may draw better nourishment. See PLANTING.

As to the duration of Roots, they are either annual, biennial, or perennial, viz.

Annual Roots.—Such that endure but one year at most, then totally perish; as of all those vegetables denominated annual plants. *Radix annua.*

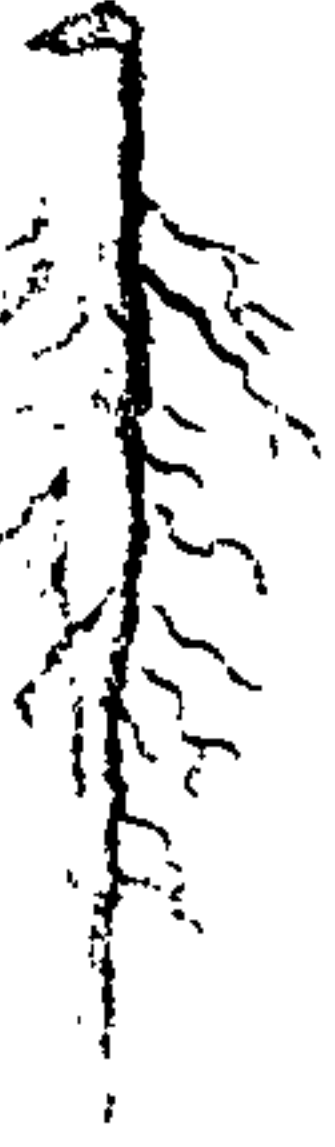
Biennial Roots.—Continue but two years, then wholly decay. *Radix biennis.*

Perennial Roots.—Being of many years' duration, and in some plants both Root and stem subsist for many years, particularly all the tree and shrub kind: many herbaceous vegetables likewise enjoy the same privilege, though the greater part are only perennial in Root, renewing the stalks, &c. annually: however, all herbaceous plants having durable or perennial Roots, are from this circumstance denominated perennials. *Radix perennis.*

Roots, we observed for the general part, penetrate within the ground to seek nourishment from the soil; there are however some exceptions;

ROOTS

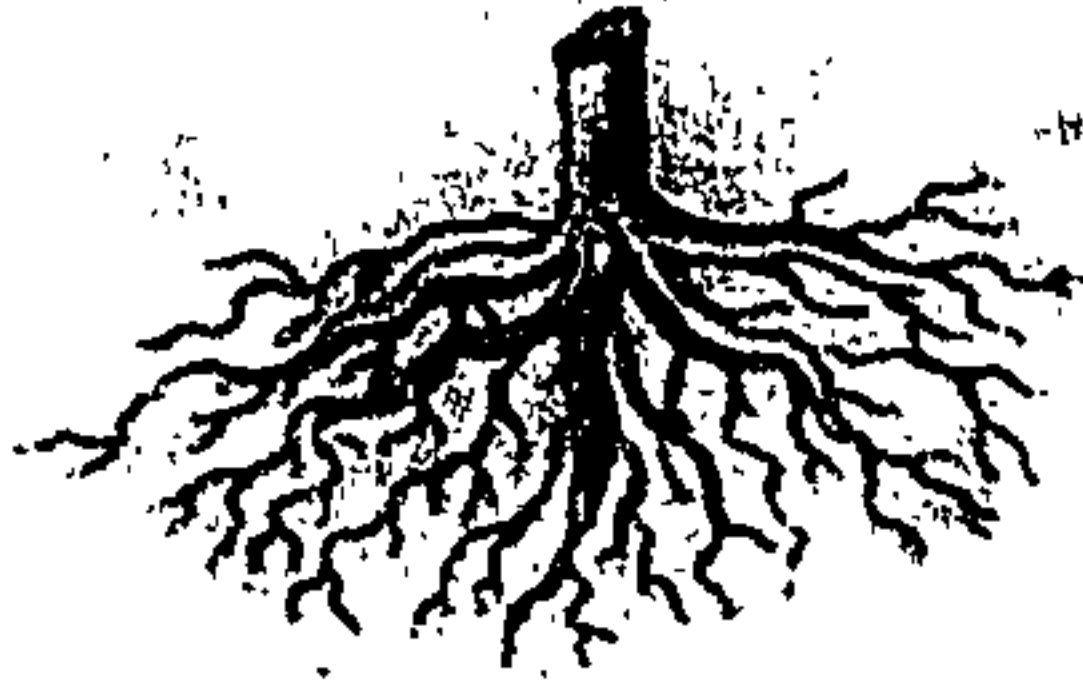
Perpendicular



Horizontal



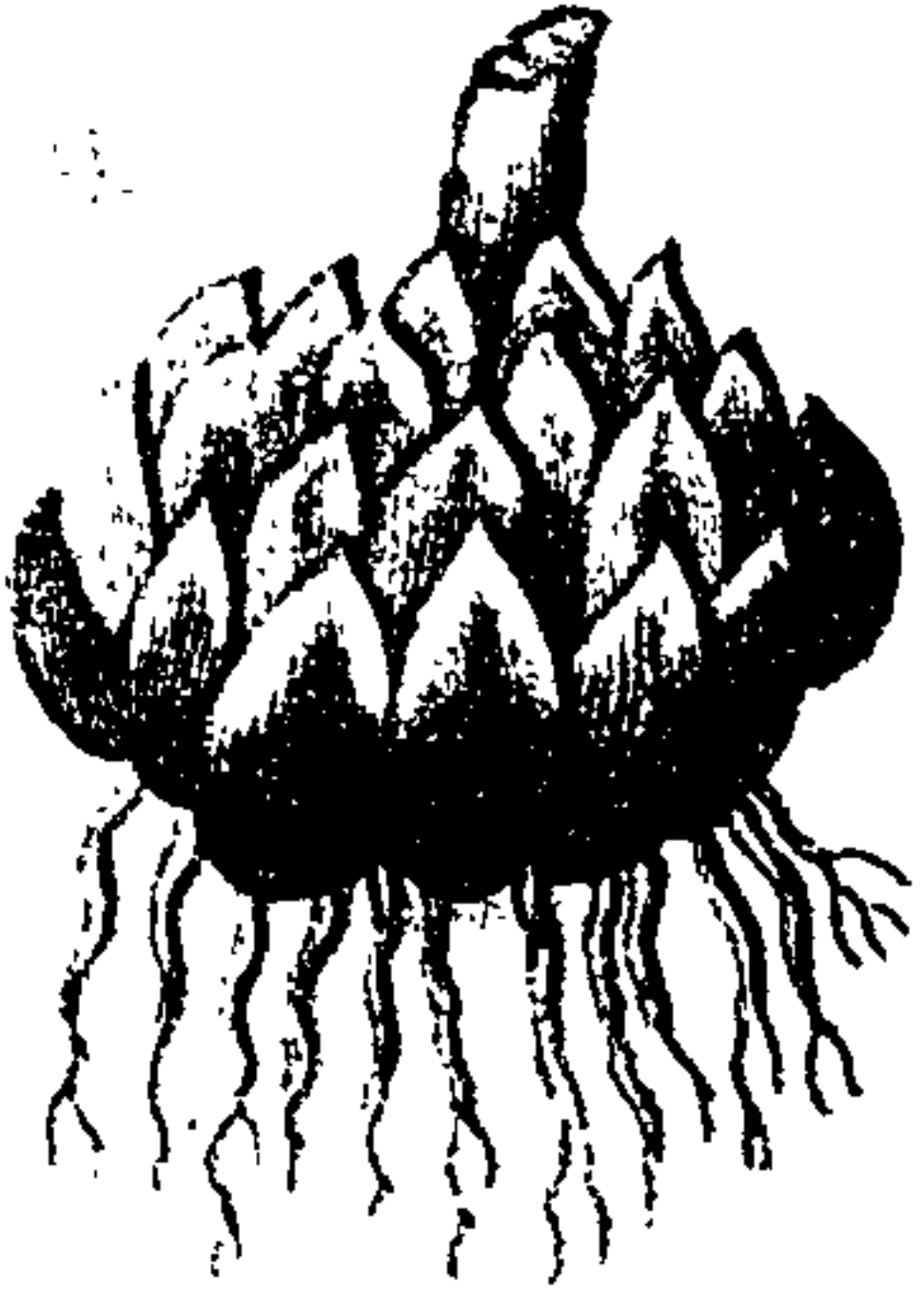
Branched



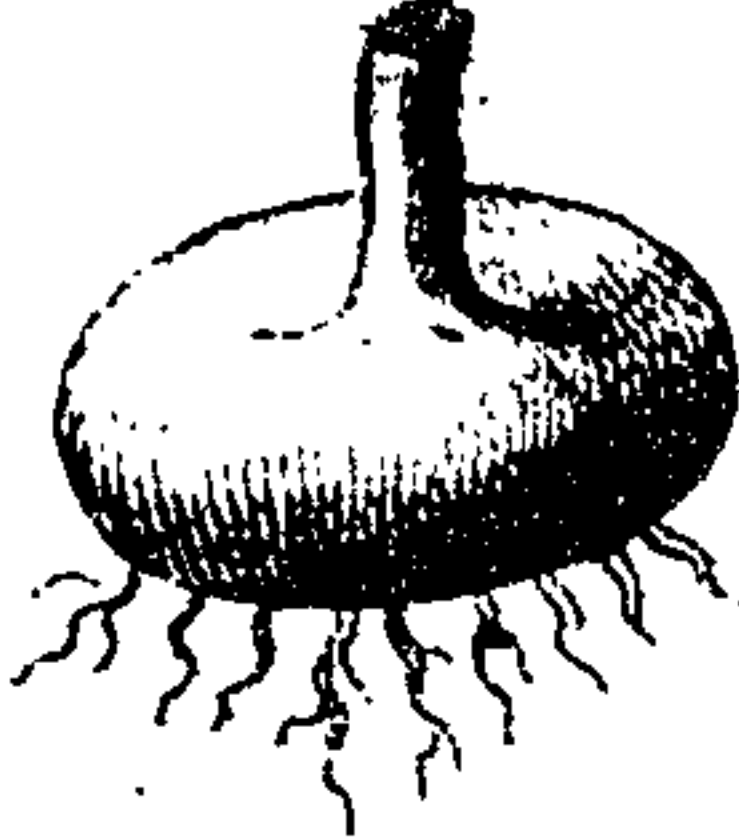
Spindle Shaped



Squamous bulb



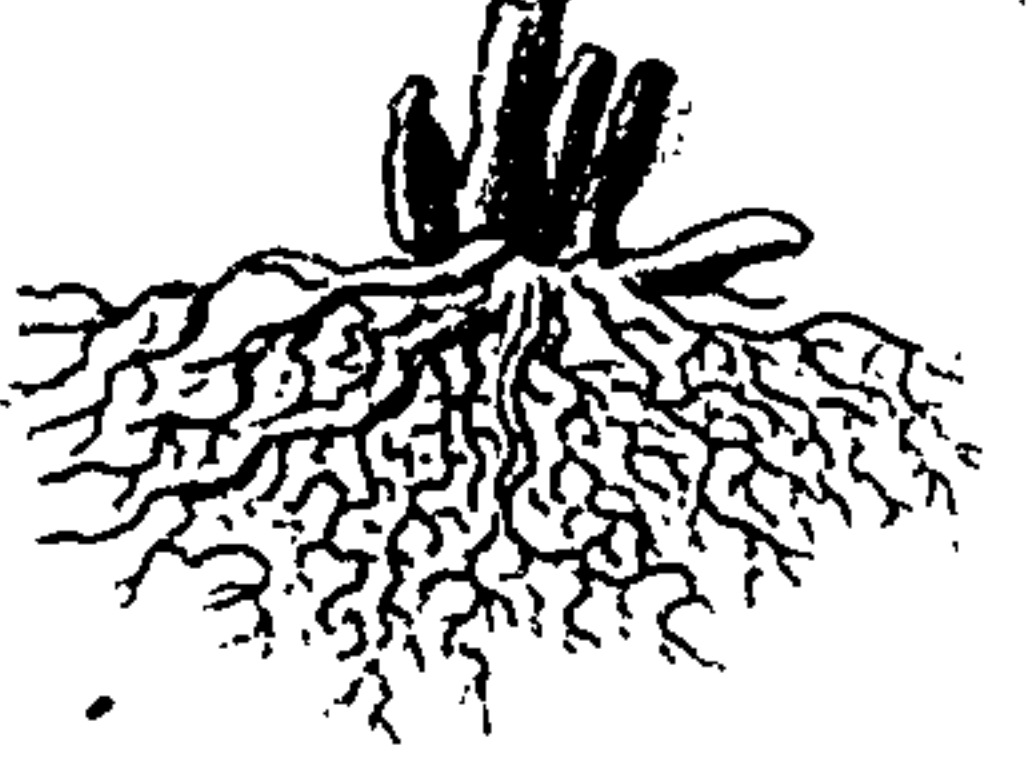
Solid Bulb



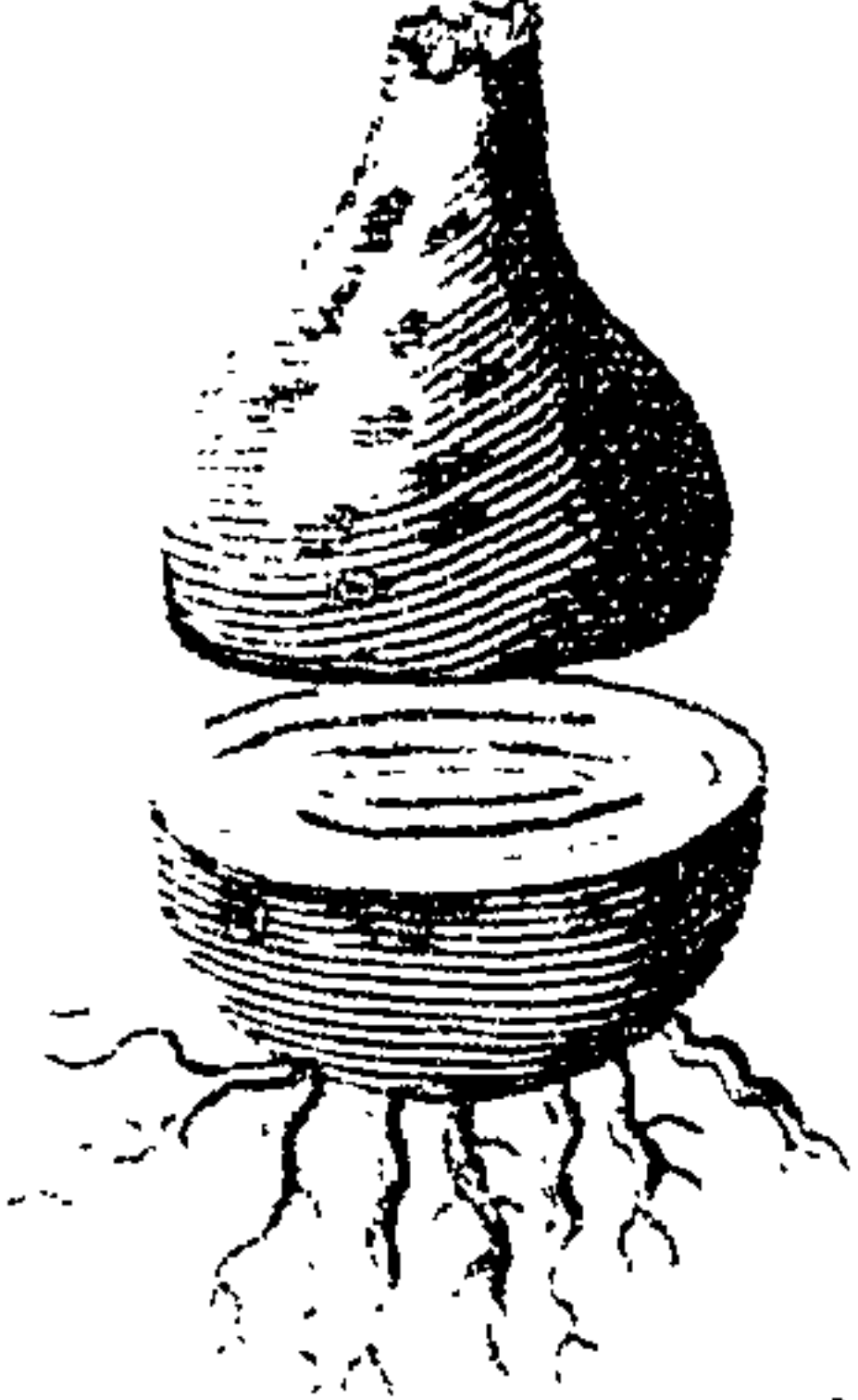
D^o cut



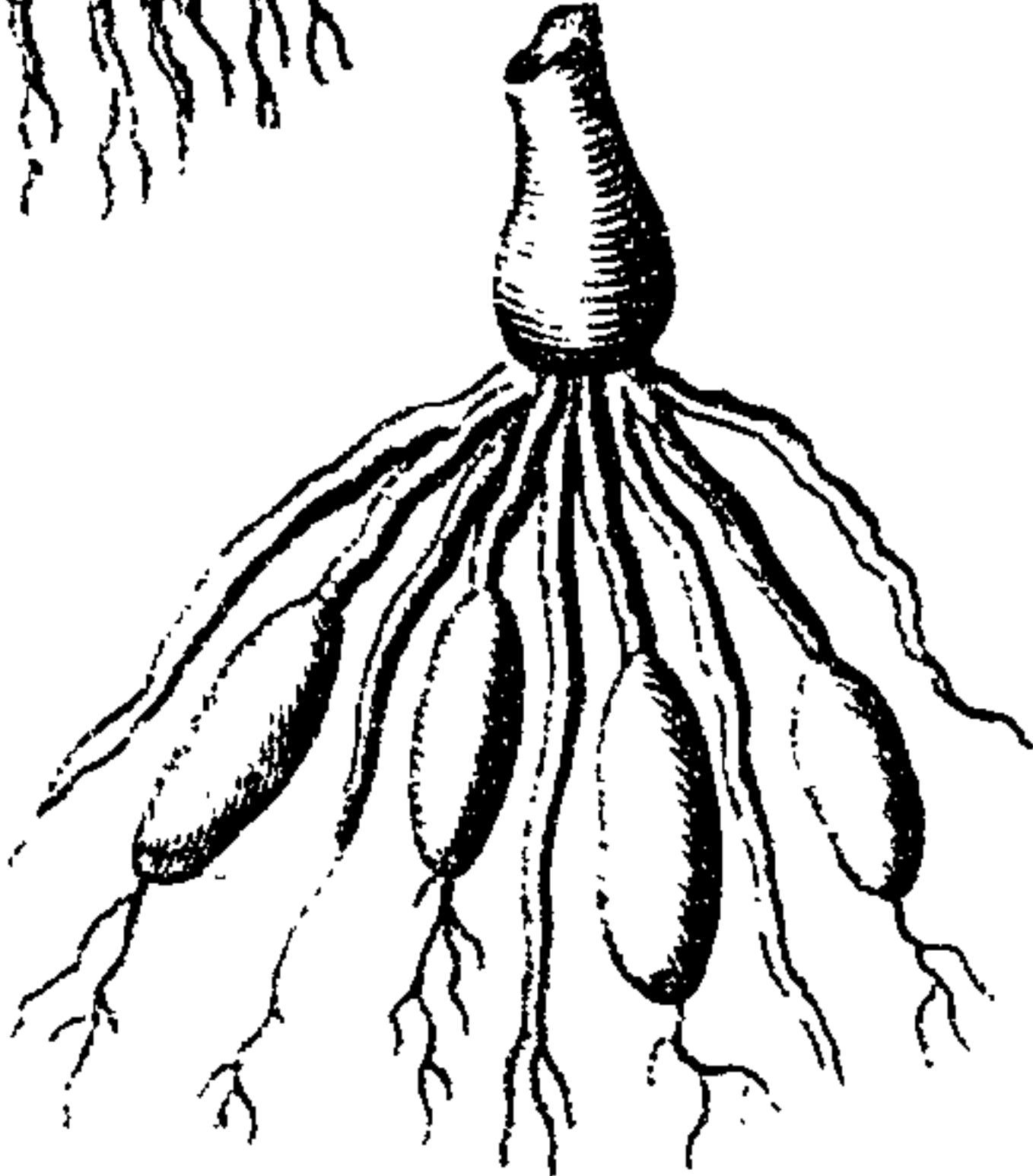
Fibrous



Costal Bulb cut



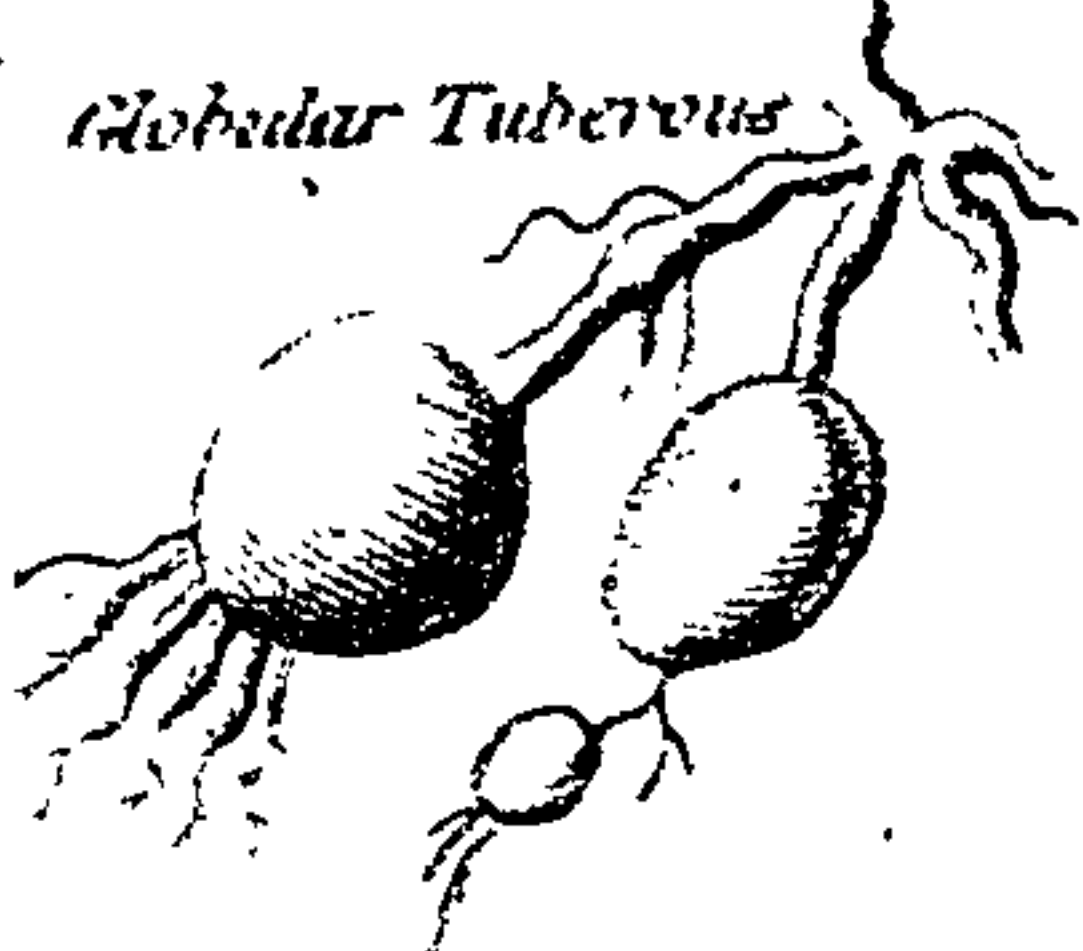
Tuberous



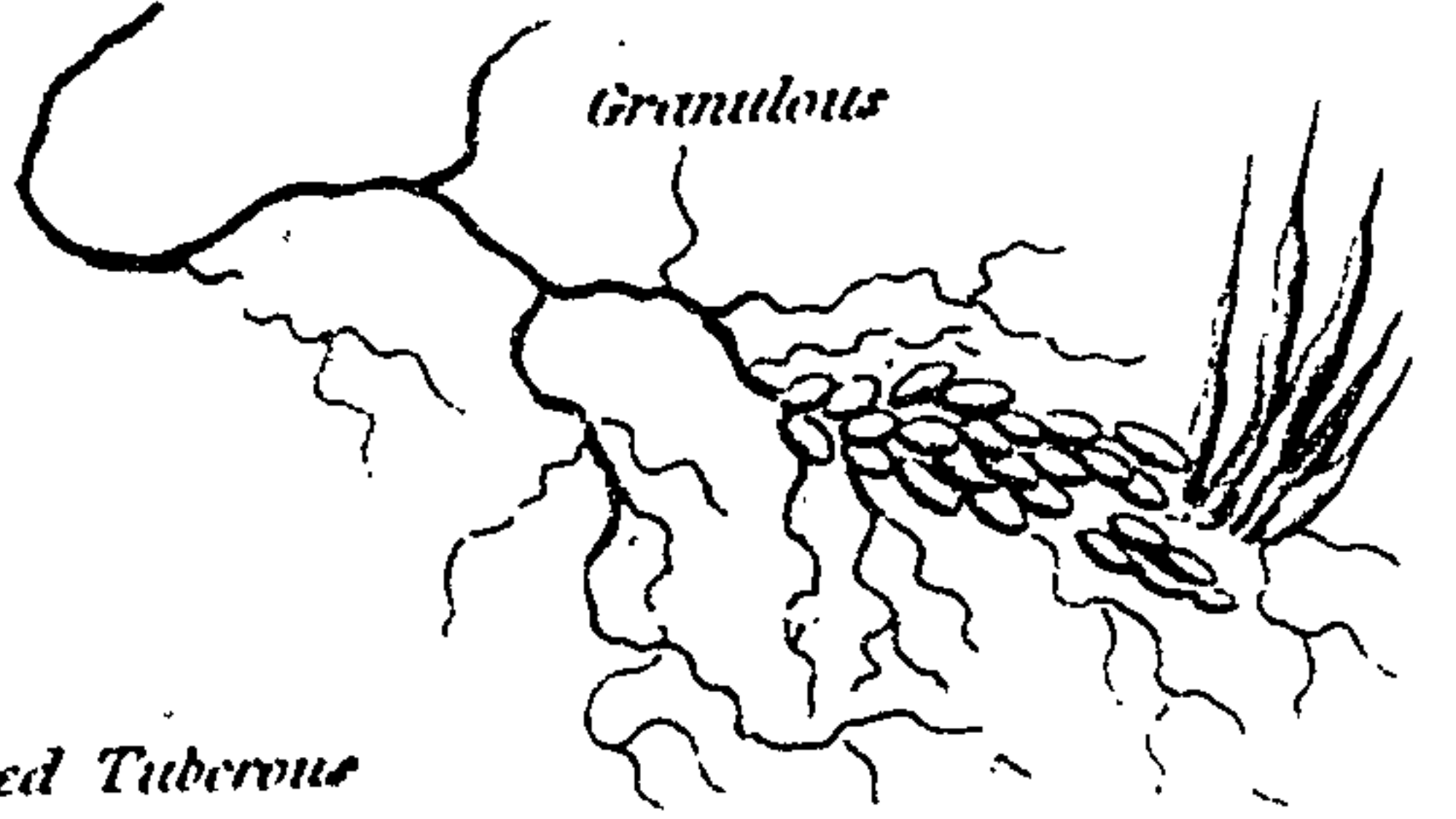
Repent



Globular Tuberous



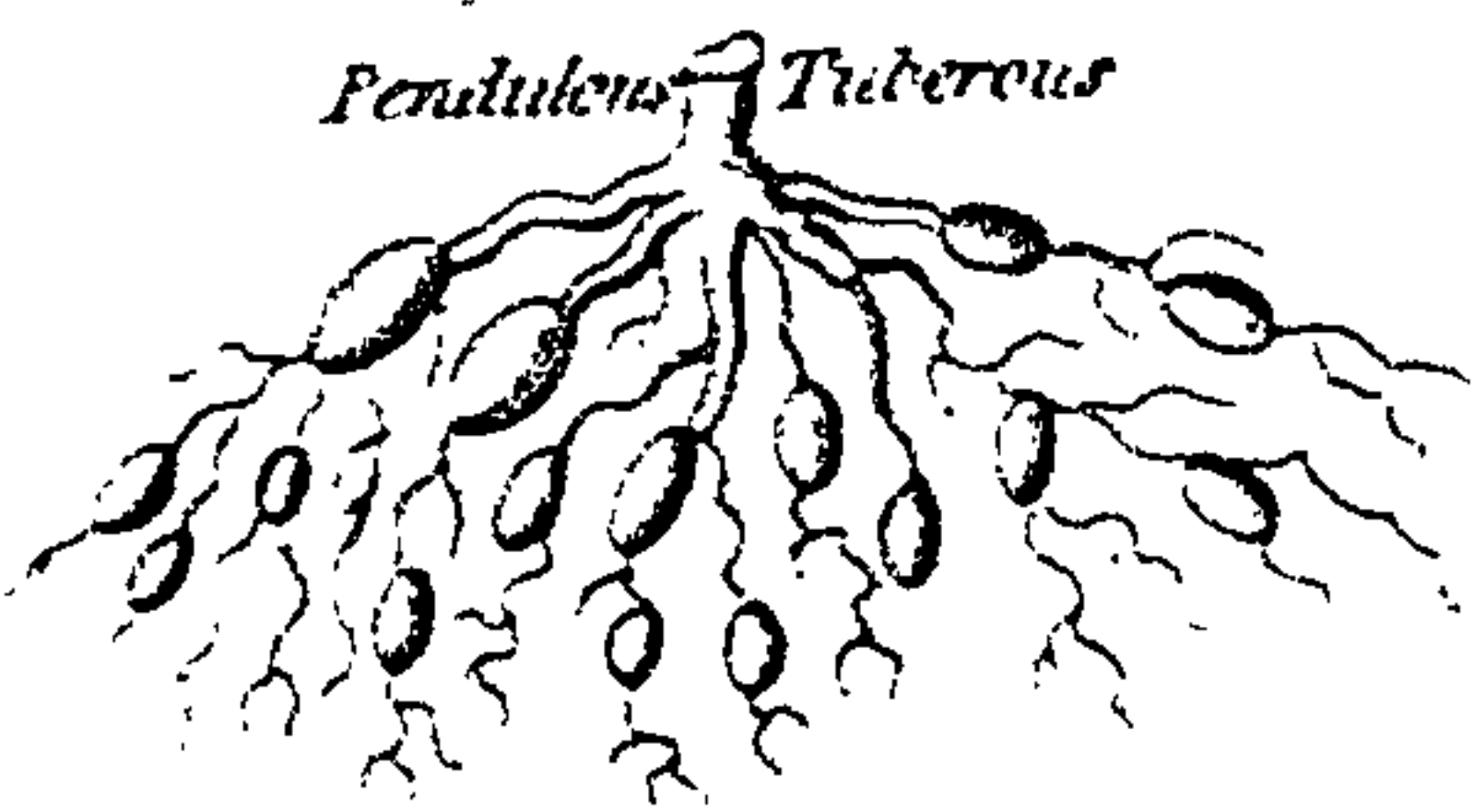
Granulose



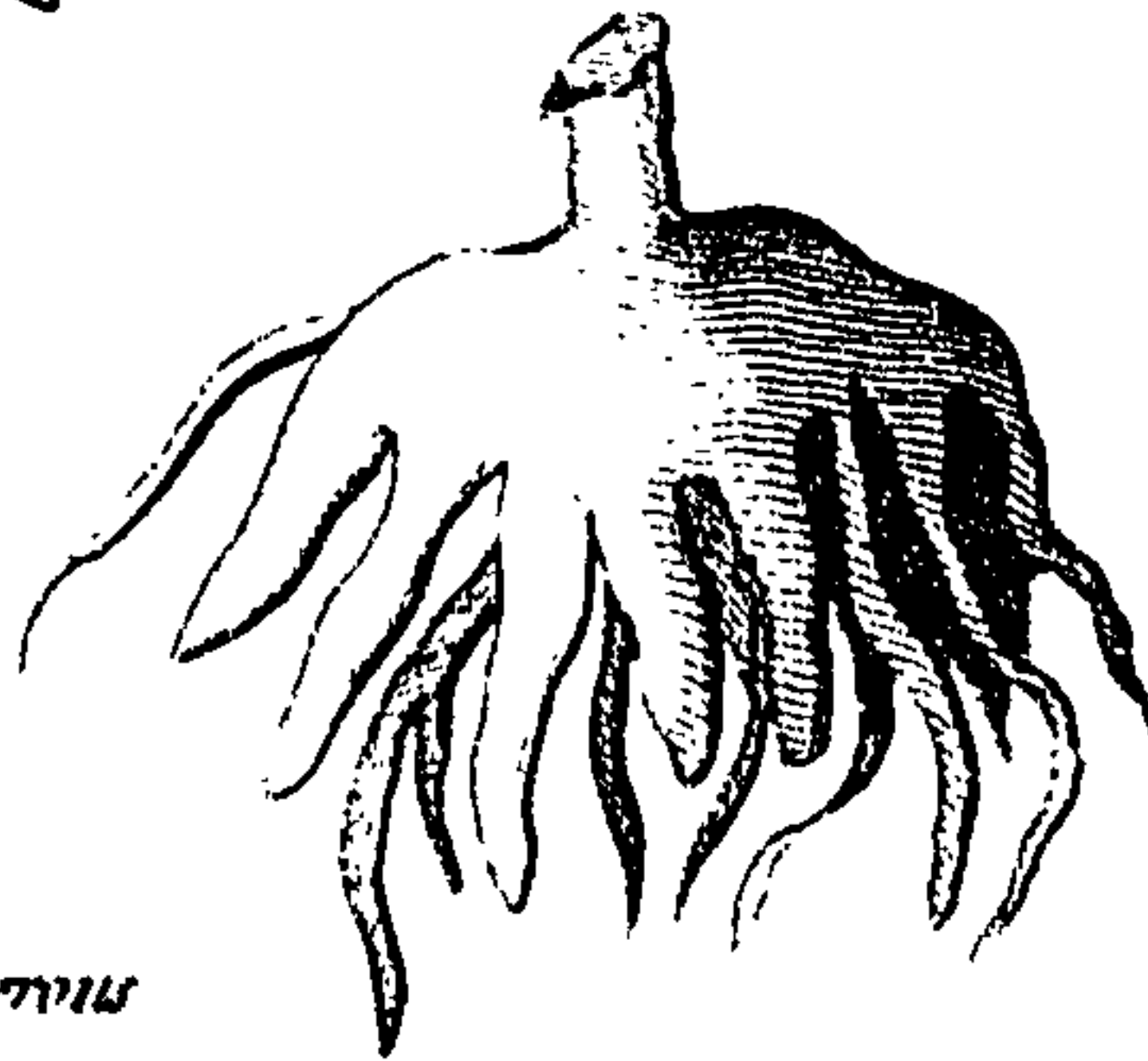
Grumous



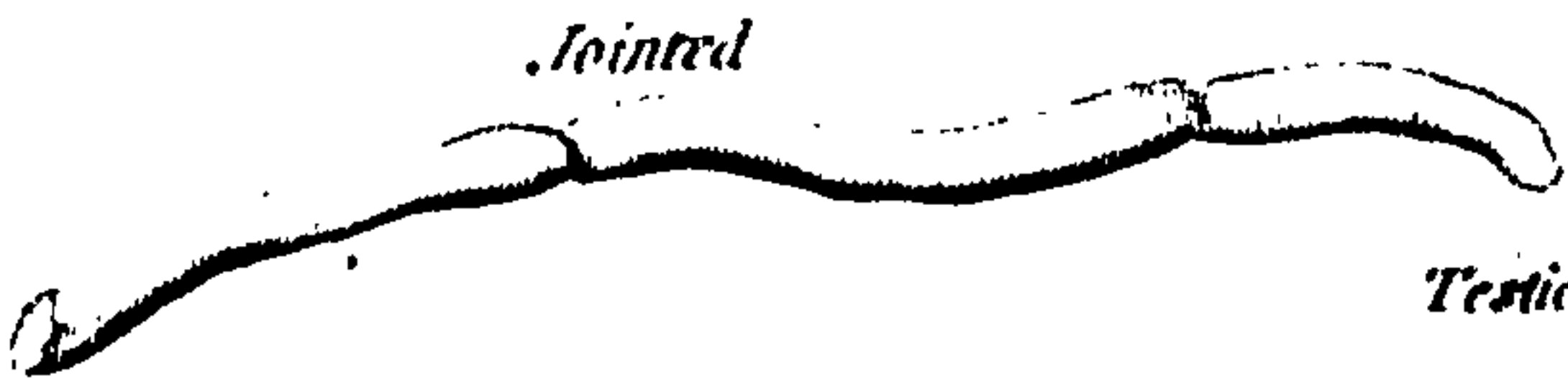
Pendulous Tuberous



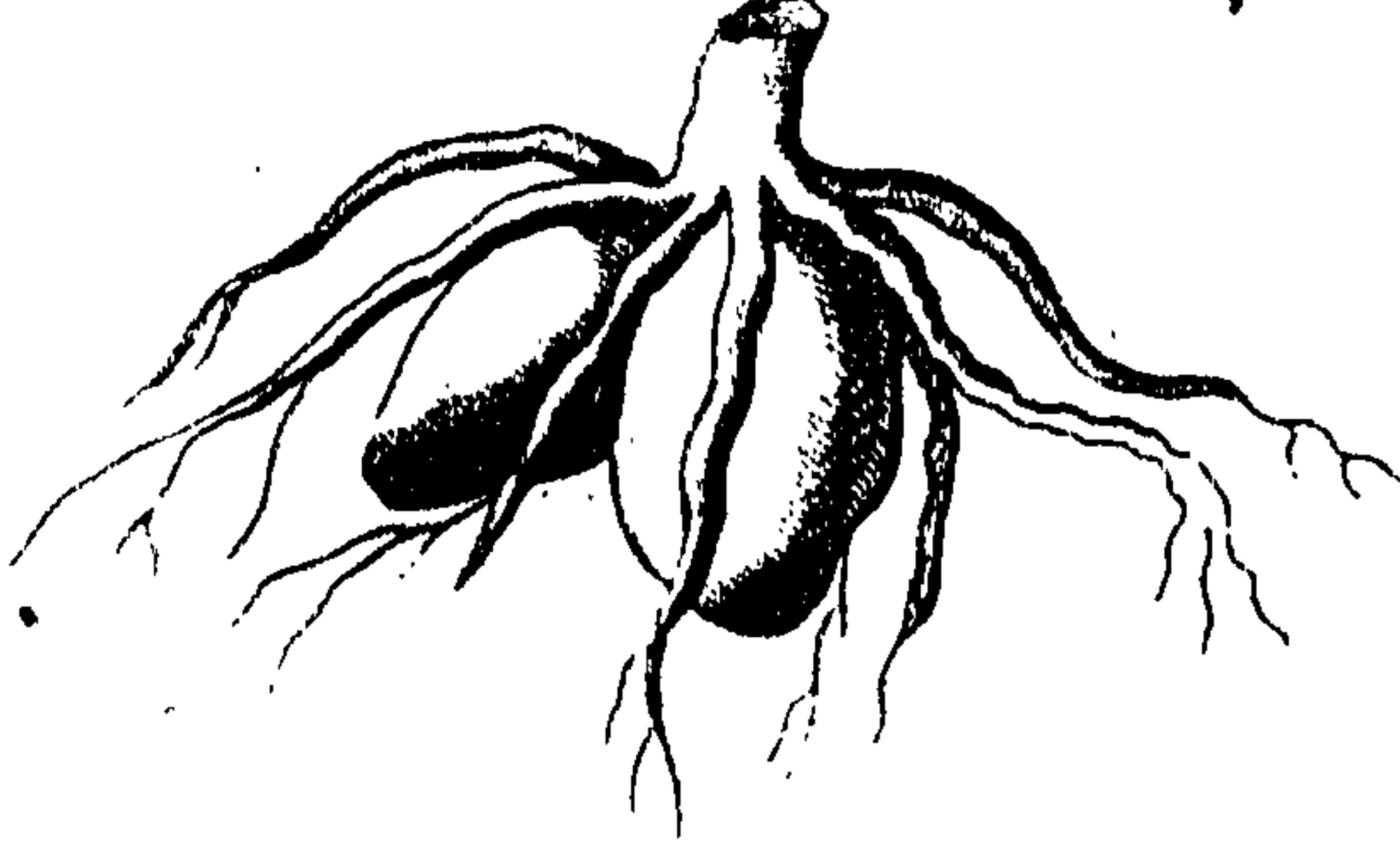
Handed Tuberous



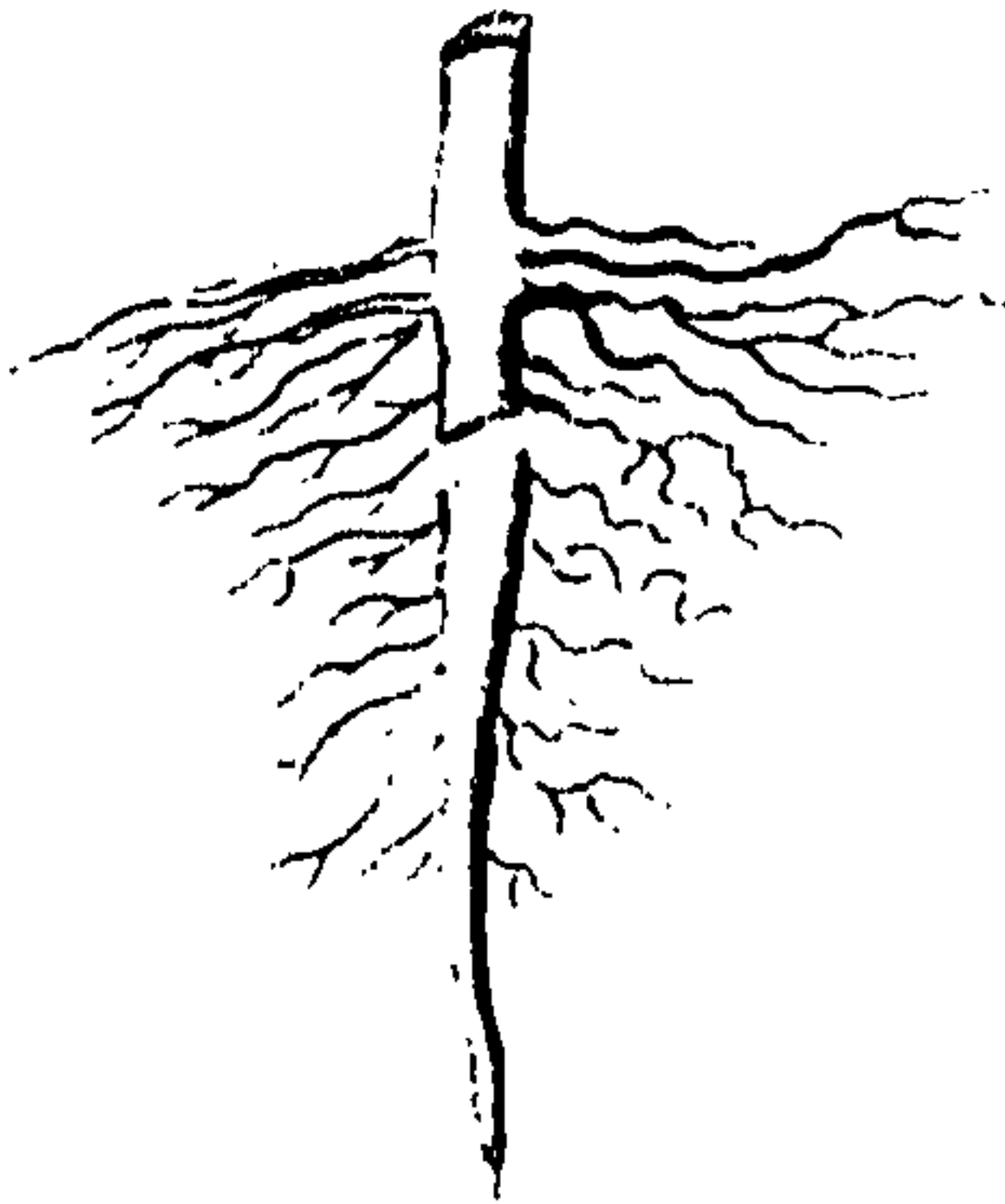
Jointed



Testiculated Tuberous



Tap



exceptions; the mistletoe plant attaching itself to the branches of trees, with its Root uppermost, which penetrates between the bark and wood, drawing moisture for its sustenance. Mosses and some of the fungi likewise attach their Roots to the bark of trees; lichens to stones and rocks; and some aquatics swim, both Root and top, on the surface of the water.

RADIX, PERENNIS FIBROSA, a perennial fibrous root; applicable to the tribe of fibrous-rooted Perennial plants, commonly called Perennials.

Under this description are comprehended a numerous tribe of valuable garden plants, both of the herbaceous and woody kinds, hardy and tender; but under this head shall only principally consider the hardy, Fibrous-Rooted herbaceous Perennials, perpetuated by their roots for a series of years, producing new stems every spring; comprising chiefly those of the ornamental flowery kinds, for the decoration of the different compartments of the pleasure garden, and flower borders, beds, &c. and arranged here, in this list, in the order similar to those of the other different tribes, already given under separate heads, according to their nature of growth, such as *Annual Plants*,—*Biennial Plants*,—*Bulbous Roots*, &c. and as those now under consideration are very numerous in different species and varieties, and being all fully described under their proper respective genera, shall only under this head give a general list of the proper generical names, botanic and English, of each genus, in which the different principal species and varieties of this tribe of Fibrous-Rooted herbaceous Perennials occur; such as are eligible for garden culture, in which some are also of a biennial-perennial nature, and some likewise of small, under-shrubby, herbaceous-like growth.

In the whole, the intention of this arrangement is, by exhibiting the different genera to which the various species belong, and arranged therein accordingly, to assist the memory occasionally, in recurring to the particular genera in the body of the work, in which the respective species, alluded to in this arrangement, are inserted, proceeding in the following order.

ACANTHUS, (*Acanthus*) or Bear's-Breech—several species.

ACHILLEA, Milfoil or Yarrow—many species.

ACONITE, Winter, (See *Helleborus*)—one species.

ACONITUM, Aconite, Wolf's-bane or Monk's-Hood—six or eight species.

ACORUS, Sweet Rush—one species.

ACTEA, Herb-Christopher—three or four species.

ADIANTUM, Maiden Hair—two species.

ADONIS, Adonis flower,—one perennial species.

ADOXA, Tuberous Moschatel, or Hollow-Root—one species.

AGRIMONIA, Agrimony—three or four species.

AGROSTEMMA, (Wild Champion) Rose Champion—several species and varieties.

AJUGA, Bugle—several species.

ALCEA, Holly-hock—two species, many varieties.

ALCHEMILLA, Lady's Mantle—three or four species.

ALETIS, Bastard or Guinea Aloe—several species.

ALTHÆA, Marsh-mallow—two or three species.

ALYSSUM, Madwort—several species.

ANCHUSA, Bugloss—three or four species.

ANEMONE, Anemone—several species, and many fine varieties.

ANGELICA—three or four species.

ANTHEMIS, Chamomile—several species.

ANTHERICUM, Spiderwort—three or four sorts.

ANTHYLLIS, (Kidney Vetch), Lady's Finger, &c.—two species.

ANTIRRHINUM, Snap-Dragon—different species.

APOCYNUM, Dog's-Bane—two or three species.

AQUILEGIA, Columbine—three species, and many varieties.

ARALIA, Berry-bearing Angelica—two species.

ARISTOLOCHIA, Birth-wort—three or four species.

ARNICA, Leopard's-bane—two species.

ARTEMISIA, Mugwort, &c.—two or three species.

ARUM, Wake Robin, &c.—three or four species.

ARUNDO, Reed—two species.

ASARUM, Asarabacca—three species.

ASCLEPIAS, Swallow-wort—seven or eight species.

ASCYRUM, St. Peter's-wort—two or three sorts.

ASPHODELUS, Asphodel, or King's-spear—two or three species.

ASTER, Star-wort—many species.

ASTRAGALUS, Liquorice Vetch, or Milk Vetch—three or four species.

ASTRANTIA, Black Master-wort—two species.

ATROPA, Deadly night shade—two species.

AURICULA, (see *Primula Auricula*)—numerous fine varieties.
 BELLIS, Daisy—one species, having many varieties.
 BETONICA, Betony—three different sorts.
 BORAGO, Borage—one species.
 BRYONIA, Bryony—one species.
 BUBON, Macedonian Parsly—one species.
 BUPHTHALMUM, Ox-Eye—two species.
 BUPLEURUM, Hare's-Ear—one species.
 BUTOMUS, Flowering Rush—one species.
 CACALIA, Foreign Colt's-foot — three species.
 CALTHA *palustris*, Marsh-Marigold—two varieties.
 CAMPANULA, Bell-flower—many species and varieties.
 CANNABIS, Hemp—one species.
 CARDAMINE, Lady's-Smock — two or three sorts.
 CATANANCHE, Candy Lion's-foot—one species.
 CENTAUREA, Centaury—many species.
 CERINTHE, Honey-wort—two species.
 CHEIRANTHUS, Wall-flower, Stock-gilliflower, &c.—two or three species, and many varieties.
 CHELONE, Chelone—four species.
 CHRYSANTHEMUM, Corn Marigold—several species.
 CHRYSOCOMA, Goldy Locks—two species.
 CHRYSOSPLENIUM, Golden Saxifrage—two species.
 CLEMATIS, Virgin's Bower—two species.
 COCHLEARIA, Scurvy-grass—two official species.
 COLUTEA, Bladder Sena—one species.
 CONVALLARIA, Lily of the valley, &c.—four or five species.
 CONVULVULUS, (*Convolvulus*), — Bind-weed—see the genus.
 CONYZA *candida*, White Flea-Bane.
 CORTUSA, Bear's-Ear Sanicle—two species.
 COTYLEDON *umbilicus*, Navel-wort—one species, several varieties.
 CRAMBE, Sea-Cabbage,—see Kitchen garden plants.
 CREPIS, Bastard Hawk-weed—two species.
 CRITHMUM, Samphire—one species.
 CYCLAMEN, (*Cyclamen*), Sow-Bread — four species, many varieties.
 CYNOGLOSSUM, Hound's Tongue — four species.
 CYPRIPIEDUM, Lady's Slipper—three or four species.
 DELPHINIUM, Larkspur—two species.
 DENTARIA, Tooth-wort — two or three species.
 DIANTHUS, Pink, Carnation, Sweet Wil-

liam, &c.—three or four species, comprising numerous varieties.
 DICTAMNUS *albus*, White Dittany.
 DIGITALIS, Fox-glove—three or four species.
 DODARTIA *orientalis*, Eastern Dodartia—one species.
 DODECATHEON *Meadia*, American Cow-slip—one species.
 DRACOCEPHALUM, Dragon's Head—three species.
 ECHINOPS, Globe Thistle—two species.
 EPILOBIUM, French Willow—five or six species.
 EPIMEDIUM, Barren-wort—one species.
 ERIGERON, Erigeron, or greater Flea-wort—three or four species.
 ERYNGIUM, Eryngo, or Sea Holly—several species.
 ERYSIMUM, Hedge Mustard—one species, some varieties.
 ERYTHRONIUM, Dog's Tooth—one species, several varieties.
 EUPATORIUM, Hemp Agrimony — several species.
 FERULA, Fennel Giant—several species.
 FRAGARIA, Strawberry—one principal species, many varieties.
 FUMARIA, Fumatory—several species.
 GENTIANA, Gentian—several species.
 GERANIUM, Crane's Bill—seven or eight species.
 GEUM, Herb-bennet—three or four species.
 GLOBULARIA, Globular, or Blue Daisy—one species.
 GLYCYRRHIZA, Liquorice—two species.
 GNAPHALIUM, Cud-weed, &c.—three species.
 HEDYSARUM, French Honeysuckle—several species.
 HELIANTHUS, Sun-flower—several perennial sorts.
 HELLEBORUS, Hellebore, or Bear's-foot ; comprising the Christmas-rose and Winter Aconite—four species.
 HELONIAS, Helonias—two species.
 HEMEROCALLIS, Day Lily—two species.
 HEPATICA, (See *Anemone Hepatica*).
 HESPERIS, Rocket, &c.—three species.
 HIERACIUM, Hawk-weed—one species.
 HUMULUS, Hop Plant—one species.
 HYDRASTIS, Yellow-root—one species.
 HYSSOPUS, Hyssop (under-shrubby)—one species.
 IBERIS, Candy-tuft—one species.
 IRIS, Flower-de-luce, &c.—many species.
 Ixia, (*Ixia*) (Bulbous and tuberous-rooted)—two species.

LATHYRUS

LATHYRUS, (Chickling Vetch) Everlasting Pea—one perennial species.
 LAVATERA, (*Lavatera*) Cretan, and Tree Mallow—two or three species, perennial.
 LIGUSTICUM, Lovage—two species.
 LINUM, Flax—one perennial.
 LOBELIA, Cardinal-flower—two species.
 LUNARIA, Moon-wort—one species, perennial.
 LUPINUS, Lupine—one perennial.
 LYCHNIS, (*Lychnis*) or Campion—three or four species.
 LYSIMACHIA, Loose-strife—five species.
 LYTHRUM, Willow Herb—one species, some varieties.
 MALVA, Mallow—two species, sometimes cultivated for variety, &c.
 MATRICARIA, Fever-few—one species, several varieties.
 MEDICAGO, Medic—one hardy perennial.
 MELISSA, Balm—three species.
 MENTHA, Mint, Penny-royal — several species.
 MIMULUS, Monkey-flower, &c.—one species.
 MOMORDICA, Male Balsam Apple—one species.
 MONARDA, Oswego Tea—three species.
 MORINA, (*Morina*)—one species.
 NAPÆA, Virginia Mallow—two species.
 NEPETA, Cat mint—one species.
 NYMPHÆA, Water Lily—two species.
 CENOTHERA, Tree Primrose—several species.
 OPHRYS, Twyblade, Bee-flower, &c.—four or five species.
 ORCHIS, (*Orchis*) Fool-stones—several species.
 ORIGANUM, Origany or Marjoram—two species.
 OROBUS, Bitter Vetch—several species.
 OXALIS, Wood Sorrel—two species.
 PÆONIA, Peony—two species, with several varieties.
 PANAX, Genseng—two species.
 PAPAVER, Poppy—two perennials.
 PENSTEMON, Bastard Asarum—two species.
 PHLOX, Lychnidea—several species.
 PHYSALIS, Winter Cherry—two hardy perennials.
 PHYTEUMA, Horned Rampion.
 PHYTOLACCA, American Night-shade—two species.
 PISUM, Pea—one species.
 PLUMBAGO *Europæa*, European Lead-wort.
 POLEMONIUM, Greek Valerian—three or four sorts.
 POLYANTHUS (see *Primula*).

POLYGALA, Milk-wort—two or three species.
 POLYGONUM, Bistort or Knot-grass—two or three species.
 POTERIUM, Burnet—one species.
 POTENTILLA, Cinquefoil—several sorts.
 PRIMULA, Primrose, Polyanthus, Auricula, &c.—three or four species, and numerous varieties.
 PULMONARIA, Lung-wort—two species.
 PULSATILLA, Pasque-flower, (see *Anemone Pulsatilla*).
 PYROLA, Winter-green.
 RANUNCULUS (*Ranunculus*) Crow-foot—several species, and numerous fine varieties.
 RANUNCULUS, Globe, (see *Trollius*)—two species.
 RESEDA, *Luteola*.
 RHEUM, Rhubarb—several species.
 RHENIA, American Loofestribe—two or three species.
 RUBIA, Madder—two species.
 RUBUS, Raspberry, &c.—one or two species.
 RUDBECKIA, Dwarf American Sun-flower—several species.
 RUMEX, Dock, Sorrel, &c.—several species.
 SALVIA, Sage, Clary, &c.—several species.
 SAMBUCUS *Ebulus*, Dwarf Elder, one species.
 SANGUINARIA, Puccoon—one species.
 SANTOLINA, Lavender Cotton—two species.
 SAPONARIA, Soap-wort—one species, some varieties.
 SARRACENA, Side-saddle Flower—two species.
 SATUREIA, Savory—two species.
 SATYRIUM, Lizard-flower—three species.
 SAXIFRAGA, Saxifrage—many species.
 SCABIOSA, Scabius—many species.
 SCANDIX, Shepherd's-needle—one species.
 SCORZONERA, (*Scorzonera*) Viper-grass—one species.
 SCROPHULARIA, Fig-wort—two species.
 SCUTELLARIA, Skull-cap—three species.
 SEDUM, Lesser House-leek, Orpine, Stone-crop, &c.—many species.
 SEMPERVIVUM (Ever-living) Greater House-leek—three or four species.
 SENEIO, Groundsel—two species.
 SERRATULA, Saw-wort—six or seven species.
 SIDERITIS, Iron-wort—one species.
 SILENE, Viscous Campion—three or four species.
 SILPHIUM, Bastard Chrysanthemum—three or four species.
 SISYMBRIUM *Nasturtium*, Watercress.
 SISYRINCHIUM, Bermudiana—one species.

SRUM, (Water Parsnep) Skirret—one species.
SMILAX, Rough Bind-weed—different species.

SMYRNIUM, Alexanders—one species.

SOLANUM, Nightshade—different species.

SOLDANELLA, Soldanel—one species.

SOLIDAGO, Golden Rod—many species.

SOPHORA, Sophora—two species.

SPIGELIA, Worm-grass—one species.

SPIRÆA, Spiræa-Frutex, &c.—three or four species, several varieties.

STATICE, Thrift, or Sea Pink—several different species.

SYMPHYTUM, Comphry or Comfrey—two or three species.

TABERNÆMONTANA, (*Tabernæ*)—two species.

TAMUS, Black Bryony.

TANACETUM, Tansey—three species, some varieties.

TELEPHIUM, True Orpine—one species.

TEUCRIUM, Germander—many species.

THALICTRUM, Meadow Rue—many species.

THYMUS, Thyme—several different sorts (under-shrubby).

TRACHELIUM, Umbelliferous Throatwort—one species.

TRADESCANTIA, Virginia Spider-wort—one species, some varieties.

TRAGOPOGON, Goat's Beard—two or three species.

TRIFOLIUM, Trefoil, or Clover—different species.

TRILLIUM, Herb True-love of Canada—two species.

TROLLIUS, Globe Ranunculus, &c.—two species.

TUSSILAGO, Colt's foot—several species.

URTICA, Nettle—two or three cultivated sorts, for variety.

VACCINIUM, Whortleberry—different species.

VALERIANA, Valerian—several species.

VERATRUM, White Hellebore—three species.

VERBASCUM, Mullein—many species.

VERBENA, Vervain—one or two species.

VERONICA, Speedwell, &c.—many species.

VICIA, Vetch—several species.

VINCA, Periwinkle—two species, several varieties—see also the list of *Evergreens*.

VIOLA, Violet—many species and varieties.

YUCCA, Adam's Needle—two hardier species. See also the green-house plants' arrangement.

ZYCOPHYLLUM, Bean Caper—one species.

The foregoing list comprises the names of the genera, in which are arranged all the principal species and varieties of hardy, fibrous-

rooted, herbaceous perennials of our gardens, very numerous, and mostly considered principally as ornamental-flowering plants, and for variety, &c. including some of a biennial nature, but considerably the most abundant of the perennial tribe; and most generally herbaceous, except some few that may be introduced, which are of an undershrubby, herbaceous-like growth, such as hyssop—sage—savory—thyme—wall-flower—stock-gilliflower—&c. having all abiding stalks and branches, and in the four former particularly, may be considered as rather belonging to the shrubby tribe; though, exclusive of these sorts, there are very numerous kinds, ten or twenty to one, entirely herbaceous in their top growth, wholly renewing their stalks, stems, and tops every spring: and being all more or less of the fibrous-rooted kind, the roots accordingly, in many sorts, consist of a multitude of small radicle fibres; in others of more thick, fleshy, fibrose radicles; some tuberos knobbed, and bunched, terminating in numerous fibres, and some of large fleshy roots, either roundish, oblong, forked, &c. in different sorts of plants, all furnished also with many fibrose radiculae, whereby to draw nourishment for the support of the vegetable.

Thus, under the denomination of fibrous-rooted perennials, of the above nature of growth in root and stems, &c. are comprised numerous fine and valuable plants, mostly all perennial, or durable of many years' continuance, in their said roots, but mostly annual in the stalks, which, in the greater part, rising directly from the roots in the spring, attain full growth the same year, earlier or later in the different sorts, flowering and produce seeds, then wholly decay to the ground; or others having low tufty abiding shoots, or some of a ligneous, or somewhat herbaceous-under-shrubby nature, with durable stalk and branches, and from which, in both cases, the flower-stalks are generally produced, not rising directly from the root, but also decay when the flowering, &c. is past, and some being of a biennial, or biennial-perennial growth, the whole, both top and root, is generally either only of two or three years' duration, or if any continue longer, they become feeble and straggling, seldom flowering but once in full perfection, in the same individual plants; though, in some sorts, being renewed by slips, cuttings, layers, &c. forming young plants, are thereby continued in a perennial state.

However, in all the naturally perennial kinds, which compose considerably the greater part of the plants alluded to in the preceding list, twenty to one or more, the same roots, continuing, some also the tops, but more generally

rally the roots only, remaining of many years' duration as before intimated, produce new stems, and flower-stalks every year in the spring, that flower the same year, always in equally good perfection, in their proper season; some early, in the different spring months, others, or the principal part, in summer, and many also in autumn; furnishing in the many different species and varieties a constant succession of flowers, from January or February, till November.

And in most of the sorts, the roots increase and multiply abundantly by off-sets, &c. to afford a plentiful propagation: some, however, more sparingly than others, and in default of a sufficient production of off-sets, many sorts are propagated by cuttings of their young flower-stems in summer, some by slips, layers, and pipings, &c. of their bottom shoots; others growing with elevated, branchy heads, are sometimes propagated by slips and cuttings of the lateral young shoots thereof; and numerous sorts are raised from seed: all which is fully explained in the cultural directions for the various different species and varieties separately, in their respective genera, which being exhibited in the foregoing register, by their generical names, shows at once all those different genera, in the process of this work, wherein the various species of this kind occur; and may be readily recurred to accordingly, for the description, culture, and method of propagation in any sorts required; and which being once raised by any of the different methods of propagation, they continue many years by the root in the perennials, but those of a biennial nature are of much shorter duration, as before observed. (See *Biennial and Perennial Plants*.)

The general plants alluded to in this list of the generical names of the genera, containing the different sorts, are principally of hardy growth, such as grow freely in the full ground in beds, borders, &c. and many also to plant in pots to remain, and move to any compartments required; and as the greater part are of the flowery tribe, are proper to introduce for the embellishment of the pleasure-garden and flower borders, &c. as principal ornamental-flowering plants, and some for variety and observation, exhibiting, in the whole, or in a proper collection of different sorts, a great and pleasing diversity, both in their varied seasons of flowering, and many different growths from one or two inches, to ten or twelve feet height in their flower-stalks, in different species, together with their various modes of flowering, shapes, sizes, and colours of the flowers, &c. as expressed in their several descriptions, under their respective genera.

All the sorts may be removed for transplantation, into the different compartments required, principally in the spring, about February, March, and April, and in the autumn season, from August or September, till the latter end of October or November, in open mild weather: and those planted in the spring will mostly all flower the same year; some in the spring months, others in summer and autumn, according to their respective times in those seasons: and those planted in autumn flower the year following.

Their general culture consists principally in keeping them clear from over-bearing weeds, by hoeing, raking, &c. in spring and summer; supporting the stems of tall growths, and running or long feeble kinds; and according as the different sorts go out of flower, and the stalks decay, cut the stalks down close to the head of the plants, which clear also from decayed leaves; likewise observe, that when any sorts multiply exceedingly by bottom or root off-sets into large bunches, they should be reduced either by taking up some sorts entirely, and slip or divide them less or more, and replanted; or others, remaining in the ground, have the outward off-sets slipped off all round, or as it may seem necessary, less or more, whereby to reduce the main plant within bounds, or to proper regularity: and some very large spreading sorts having greatly increased, will sometimes require reducing considerably, or cutting in all round with the spade; as in some sorts of Asters, Golden-rods, perennial Sunflowers, &c. in all of which, the slips or detached off-sets may be planted, as many of the best of particular sorts as shall be required, the larger ones planted at once where they are to flower, and the smaller, in nursery beds for a year; and the superabundant, if any, cleared away to the rubbish heap.

The propagation of the various sorts is performed at different times, according to the nature of the plants; but in that by off-sets, slipping, or parting the roots, is performed either generally in autumn, after the flowering is past and the flower-stalks decayed, or in the spring, before they begin to shoot considerably; and by cuttings of young top-shoots and flower-stalks, is generally in the early part of summer; or that by layers, and piping slips and cuttings, is principally in June and July; and by slips of bottom young shoots, is effected both in spring and summer, or by off-set side heads and sucker young plants, may be in spring, summer, and autumn, according as they occur of proper growth. See *Cuttings—Off-sets—Layers—Parting roots—Suckers, &c.*

RAKE,

RAKE, a Garden-Rake for raking ground, and raking in seeds, &c.

To suit every department of gardening completely with Rakes, there should be three or four different sizes from about six to eighteen inches long in the head, having handles from six to eight or nine feet in length, and the head toothed with iron teeth two or three inches long, and placed from one to two inches asunder, according to the respective sizes of the Rakes for particular uses, as below.

A large RAKE.—Having the head about fifteen to eighteen inches long, the teeth three inches, and placed two inches asunder; being proper for raking stubborn or rough dug ground, and for raking in large kinds of seeds, raking off large weeds after hoeing, and for many other purposes in large gardens.

Common middle-sized RAKE.—Having the head twelve inches long, the teeth three inches, and placed one inch and half asunder; being proper for all common raking in ordinary light ground, and for raking in most kinds of small seeds, and many other purposes.

A small RAKE.—Having the head about nine inches long, the teeth two and a half, and placed one inch asunder; proper for fine-raking beds, borders, &c. and raking in some particular fine seeds; and raking between rows, &c. of certain plants occasionally, where larger rakes cannot be introduced.

A little RAKE.—Having the head six inches long, the teeth two and a half, and placed one inch asunder; being very useful for raking between small plants in beds and borders and other small compartments where the plants stand close, and in several other purposes in occasional small raking.

Garden Rakes are made both with wooden heads and iron teeth, and with the head wholly of iron; and in both of which, the teeth are generally flattened, the back edge rounded off and narrowing gradually to the point, the other straight; and are placed on the head edge-ways across, with the back edge outward, and with the points all inclining very moderately inward, in the most regular manner: the wooden-headed rakes having each end of the head hooped with a thin flat iron ring, to secure it from splitting; and either or both of which being properly fixed on a straight firm pole handle, six to eight or nine feet long, according to the size of the head, the largest have the longest and strongest shaft or handle, in proportion.

With regard to the utility of the two different sorts of rakes, wooden and entirely iron heads, the former are generally lightest and

cheapest, and are very eligible for any kind of garden raking; and the latter, iron-headed rakes, when made neat, and as light as possible, the teeth well set, in a proper position, as above, and firmly fastened, are also equally proper, and in some cases preferable, such as in wetish or moist soils, are not liable to clog so much as wooden rakes, and are more durable; though I would observe, they are more eligible for middling and small rakes, than for large ones; as, in strong raking, the teeth are more liable to get loose, than in the wooden-headed rakes; however, both the sorts are occasionally used effectually in all raking work in garden departments.

Both the sorts, in their different sizes, are sold at most of the principal iron-mongery shops, both with and without handles.

Entire wooden Rakes, having the head, teeth, and handle, wholly of wood, are sometimes used for particular purposes, such as raking in some light kinds of kitchen-garden seeds in very light ground, and for raking off large hoed-up weeds in vacant or wide clear spaces, raking up swarths of mowed short grass before the sweepers, also fallen leaves of trees in autumn, and clippings of hedges, &c. and for several other uses.

RAKING. Raking ground is a necessary culture in many cases, to break the surface of the soil small, and render it fine for the reception of particular sorts of small seeds and plants previous to sowing and planting.

Likewise, after sowing seeds in the broadcast way on rough ground, we rake them in to bury them a proper depth for germinating. Raking in seeds is the most expeditious mode of covering them in garden-sowing all kinds of small seeds of hardy plants; the ground being dug, &c. and the surface remaining rough after the spade, the seed is then sown, and then raked in with an even hand, raking only once or twice in a place, a back and a fore stroke, which being generally sufficient to cover most sorts of seeds effectually; and is the most eligible and expeditious method in the sowing most kinds of esculent or kitchen-garden seeds, and of many kinds of hardy flower seeds, and some sorts of small tree and shrub seeds. See **SOWING SEEDS.**

Raking the ground also among growing plants that stand distant enough to admit the rake is in many cases of service, particularly where the surface is inclinable to bind; or where numerous small seed-weeds appear, it will loosen the soil, and retard the growth of the weeds, and promote the growth of young plants: and raking is also good culture at particular seasons, to annoy flugs, especially in kitchen-

kitchen-gardens, to rake between rows of small plants in autumn and winter, &c.

And Raking ground is in many cases necessary for ornament, such as raking smooth the beds, borders, and other compartments of pleasure-grounds; which being now and then repeated, gives an air of culture and neatness to the premises.

Likewise, after hoeing up weeds, Raking them off is eligible in all conspicuous parts of the pleasure-ground, in particular where neatness is required, also in other districts where the weeds are large, or like to grow up again or shed their seeds as they lie on the ground.

All Raking should generally be performed in dry weather and when the ground is also moderately dry, for if raked in rainy weather, or when the ground is very moist and cloggy, the surface is apt to cake and bind hard; this should be particularly attended to in sowing seeds; nor will rough digged ground rake well when it is become very dry at top, especially if it was digged wet, and suffered to lie till the clods have become very dry and hard, in which case it will not rake well until mellowed or pulverised by a shower of rain.

But most of our common light garden-ground generally rakes best when fresh digged, perhaps the same day, or day after at the farthest, before dried too much by the sun and wind, or rendered wet by rain, &c.

However, Raking should be performed when the ground is in such order as the clods will readily break and fall to bits under the rake without clogging much thereto.

With respect, however, to Raking ground sown with seed, particularly in spring and summer, it is of importance to sow the seed generally when the ground is fresh turned up, provided it will readily rake without clogging as above said; and fresh digged ground is always promotive of a free germination in the seed sown therein.

RANDIA, (*Randia*.)

In this genus are two tender exotic evergreen shrubs of America and the West Indies, introduced here in our stove collection for variety, growing eight or ten feet high, branching by opposite pairs, alternately crossing; garnished with small, oval, and roundish, thick, opposite leaves; and small funnel-shaped, white flowers, having monophyllous, five-lobed, permanent calyxes; a tubulous, funnel-shaped corolla, five-parted above; five stamina; an oval germen, bifid style, crowned with two stigmas; and the germen becomes an oval, capsular, unilocular berry, containing many compressed, cartilaginous seeds.

Class and order, *Pentandria Monogynia*.

The species are,

1. *RANDIA mitis*.

Mild, or Smooth American Randia.] Having smooth, or almost unarmed, or thornless branches, and ovalish, thick, firm leaves.

2. *RANDIA aculeata*.

Prickly Jamaica Randia.] Having the branches armed with spinous aculei, or prickles, in pairs; and roundish-oval, shining leaves.

Both these exotic shrubs being very tender evergreens of South America and the West Indies, &c. require a constant residence here in a hot-house or stove, in which they will effect an agreeable variety all the year, as evergreens, and produce flowers in summer.

They are propagated by seed in the spring, sown in pots, plunged in a hot-bed, or the bark-bed of the stove; and when the plants are up three inches high, prick them in small pots singly, watered and plunged into the bark-bed, &c. to forward their fresh rooting and renewed growth; and afterwards managed as other similar exotics of the stove: or the propagation by cuttings and layers may also be tried by the above assistance.

RANUNCULUS, *Ranunculus* and *Crow-foot*.

This genus comprises a large collection of hardy herbaceous perennials of the grumous, and fibrous-rooted tribe; some of them most beautiful flowery plants of the gardens, others common weeds of the fields and meadows; the garden kinds having great merit as flower-plants for adorning the flower-garden and pleasure-ground, garnished with divided and entire leaves in different species, and mostly upright branchy flower-stalks, from half a foot to two feet high, terminated by pentapetalous, polyandrous flowers, which in some species abound in numerous double varieties of exceeding beauty.

Class and order, *Polyandria Polygynia*.

Characters.] CALYX, five oval, concave, coloured leaves. COROLLA, five obtuse petals, having small ungues, and a nectarium formed of a small open cavity near the base of each petal. STAMINA, numerous filaments half the length of the petals, having oblong, erect, didymous antheræ. PISTILLUM, numerous germina, collected into a head; no styles, but very small reflexed stigmas. PERICARPium, none; numerous irregular seeds attached to the common receptacle by very short pedicles.

There are forty or more different species of this genus, six or eight of which claim general esteem as flowery plants for ornamenting the gardens, and a great number are common weeds in the fields, waters, and pasture ground, not having merit for garden culture: of the garden.

garden kinds, the principal sort is the *Asiatic or Turkey and Persian Ranunculus*, which comprise many hundred varieties of large, double, most beautiful flowers of various colours; but several other species having varieties with fine double flowers, make a good appearance in a collection; though as those of each species consist only of one colour, some white, others yellow, they are inferior to the *Asiatic Ranunculus*, which being large and diversified a thousand ways in rich colours, in different varieties; however, all the garden kinds in general, described below, effect a very agreeable diversity in assemblage in the flower compartments, &c. and they being all very hardy, succeed in any open beds and borders, &c.

The most noted kinds for garden culture are the following eight species.

1. *RANUNCULUS asiaticus*.

Asiatic, or Turkey and Persian Ranunculus.]

Hath a small grumous or bundled root, composed of many very small oblong-knobbed parts connected at top; crowned with ternate and double-ternate leaves, having trifid-cut lobes; upright flower-stalks branching below, and rising from six to ten or twelve inches high, terminated each by one large flower of many different colours and properties in the varieties; flowering in April, May, and June.

Is a native of Asia, and introduced here long since from Turkey and Persia, and by way of distinction is mostly called simply *Ranunculus*.

Varieties.] The varieties of this species are amazingly numerous, and are divided into two classes, the Old Turkey kind and the Persian kinds, the varieties of the latter amounting to many hundreds, and are considerably more various, rich, and beautiful in colour, than the others.

Old Turkey kinds.] Rise with a strong generally unbranching stalk a foot high, terminated by one large double flower, sometimes emitting one or two smaller ones from its sides, and of which there are Red-flowered—Scarlet flowered—Yellow flowered—and Scarlet turban flowered, &c.—they being seldom tinged with different colours like the Persian kinds.

Persian varieties.] Rise eight or nine inches high, generally branching from the bottom, producing from five or ten to twenty or more flowers on each root, and of which there are Single flowered—Semi-double flowered—Full-double flowered, being large and full like a double rose, generally filled with petals to the very centre, forming a regular, globular body of admirable elegance, of all sorts of the most beautiful colours in different varieties, and of numerous degrees of deeper and lighter shades, stripes, and tinges in the several colours, so

as to cause an astonishing diversity of Reds,—Scarlets,—Crimsons,—Flesh-colours—Purples—Blues—Violet colours—Whites—Cream-colours—Ash-colours—Yellows—Orange-colours—Lemon-colours—Golden-yellow—Olive-yellows—Browns—Copper-colours—Blacks—Black-purples—Black-violets—Tawny-colour—Coffee-colour, &c.—and with flowers of all the above colours variously tinged and striped with two, three, or more different colours, in a very curious manner, forming the numerous varieties, amounting to above a thousand, described in some of the eminent flower-dealers' catalogues, varying from one another in some particular in different colours, tints, stripes, and variegations; and a farther increase of new varieties are annually obtained from seeds: the seedlings generally flower the second or third year, and the select kinds are continued and increased plentifully by off-sets from the root, every summer, after they have done flowering.

All the varieties flower commonly in April and May, but by late planting the roots, the blow may be continued till June; and the single and half-double flowers are succeeded by abundance of seed, but rarely any from the full doubles: the semi-doubles, however, are preferable to the singles, from which to save the seed for sowing, as there will be a greater probable chance of having double-flowered seedlings in return.

The roots of all the varieties of this species are of the keeping kind, and being lifted in summer soon after flowering, the off-sets separated and properly dried, they may be kept out of the ground several months; but it is proper to plant a quantity in autumn, and the rest in spring, in order to procure a longer succession of the flowers.

These roots are sold by all the nurserymen and seedsmen in great variety, at from two or three shillings to four or five pounds per hundred, and sometimes considerably more, for some very curious varieties.

They are all hardy enough to succeed in any common light garden-earth in open beds or borders, planted some in autumn about September, October, or November, but principally the two latter months, and the rest in February; the fine sorts being commonly deposited in beds by themselves, in rows six or eight inches asunder and two or three deep, both to exhibit a grand show of the numerous varieties all together, and for the convenience of giving occasional shelter from cutting frosts; especially of the early autumnal plantings in particular, that appear above ground in winter or early in spring: though the latter autumnal plantings

plantings put in about November, as they will not come up so early, do not require so much care, and the spring plantings need no protection at all. As to the common or more ordinary kinds, they may either be bedded like the others, or distributed about the open borders in little patches of three or four roots in each, in assemblage with other border flowers. See their *General Culture*.

2. *RANUNCULUS aconitifolius*.

Aconite-leaved White-mountain Crow-foot, or Fair-maid of France.] Hath a strong fibrous perennial root joined in a head, crowned with large quinate, or five-lobed leaves, all the lobes spear-shaped, cut and serrated; upright, strong flower-stalks, a foot and a half or two feet high, divided into many branches, garnished with small leaves like the lower ones, and all the branches terminated by pure white flowers, appearing the end of May and beginning of June.

Varieties.] Common single-flowered,—Larger double-flowered, very beautiful, and worthy of a place in every garden.

3. *RANUNCULUS acris*.

Acrid Upright Meadow Ranunculus, or Yellow Crow-foot.] Hath a fibrous clustered root, joining in a head, crowned by tripartite-multifid, or much divided leaves; upright flower-stalks a foot high, branching at top, having the upper-leaves cut into many narrow segments, and all the branches terminated by a bright-yellow flower, appearing in May.

Varieties.] Common single-flowered of the pastures,—double-flowered of the gardens,—Proliferous double-flowered, one flower growing out of the middle of another. The double kinds only are proper for garden culture.

This species in its single state is found in abundance in every pasture ground, and is seldom admitted into gardens; but the double varieties are very pretty, and merit a place in every good collection of perennials.

4. *RANUNCULUS repens*.

Creeping, or running Yellow Crow-foot.] Hath fibrous, perennial roots, crowned with compound leaves, trailing, creeping shoots, rooting as they run along, and furrowed pedunculi terminated by bright yellow-flowers, having spreading cups; flowering in May and June.

Varieties.] Common single-flowered of the meadows and pastures,—Double-flowered of the gardens.

5. *RANUNCULUS Ficaria*.

(Ficaria)—Fig-wort, or Pile-wort.] Hath a grumous or bundled tuberous root, heart-shaped, angular, smooth leaves, on strong foot-stalks, and upright simple stalks rising four or five inches high, terminated by large

shining yellow flowers, in March and April.

Varieties.] Common single-flowered of the meadows, &c.—Double-flowered of the gardens.

6. *RANUNCULUS amplexicaulis*.

Amplexicaulous, Plantain-leaved, Alpine Ranunculus.] Hath a bundled perennial root, oval, acuminate, glaucous leaves embracing the stalk, the stalk rising from six to eighteen inches high, branching and terminated by several single white flowers; appearing in April.

7. *RANUNCULUS gramineus*.

Grass-leaved Pyrenean Ranunculus.] Hath a bulbo-tuberous, perennial root, spear-shaped, narrow, grassy, sessile leaves; upright stalks about a foot high, branching upwards, each branch terminated by a small, pale-yellow flower; appearing in May.

Varieties.] Common single-flowered—Double-flowered.

8. *RANUNCULUS grandiflorus*.

Great Yellow-flowered Oriental Ranunculus.] Hath a fibrous perennial root, multifid or many-parted leaves; erect stalks a foot or more high, garnished with two alternate close-fitting leaves; and terminated by one large yellow flower; appearing in May.

The flowers of all the above eight species of *Ranunculus*, in their single or characteristic state, consist each of five obtuse bright petals, and the middle filled with numerous stamina, &c. succeeded by abundance of seed; but in the double-flowered varieties the petals are multiplied in many series, which in the full doubles are continued to the very centre, like a double-rose, in which consists their excellence as garden-flowers for ornament: though in these very luxuriant or full double-flowers, the multiplicity of petals often supplant all the stamina that no seed is produced. This however is amply compensated by the singles and half-doubles, which are succeeded by great plenty of seed, ripening in June and July; but it is only of the *Asiatic Ranunculus* that seed is required, which in this species in particular is always productive of a great variety of new sorts, but not in any of the other species, remarking, that the finest semi-doubles are the sorts from which to save the seed for propagation.

All the species are perennial in root, and annual in leaf and stalk, which rise in spring and decay in summer and autumn soon after they have flowered; the roots of all the sorts being abiding, increase abundantly by off-sets every year for propagating the particular varieties.

Considered as garden-flowers, all the sorts demand attention; the Asiatic kinds however stand foremost considerably in point of beauty, elegance, and variety, but some of all

the sorts are proper furniture for the borders and other compartments of the pleasure-garden, where being disposed in assemblage they will effect a good diversity in flower for two or three months, and some of the finest of the Asiatic varieties should also be deposited in beds by themselves, as before observed, in order to exhibit a grand blow together; observing, that the roots of the fine varieties of this species should be lifted every year after blowing, to separate the off-sets and fresh prepare the mould, &c. but all the other fibrous-rooted species being distributed about the borders may remain undisturbed two or three years, or as it shall seem necessary, according as they may want trimming to keep them within bounds, or to have the roots taken up occasionally to part them for propagation.

Culture of the Asiatic Kinds.

The *Asiatic Ranunculus* in particular is in high estimation among the florists, and is deservedly an object of admiration on account of the great number of the varieties; and the beauties the flowers possess, in their elegance of form and vast variety and richness of colour, render them superior to most other flowers of the season, and highly merit culture in every garden.

This species in all its varieties will succeed in any light, rich garden earth; but the florists often prepare a particular compost for the fine varieties, consisting of good garden mould or pasture-earth, sward and all, a fourth-part of rotted cow-dung, and the like portion of sea-sand (see COMPOST); and with this, after having remained in a compost heap several months, for all parts to rot, and incorporate properly together, they prepare beds four feet wide and two deep: however, in default of such compost, use beds of any good light earth of your garden; or if necessary, it may be made light and rich with a proportion of drift-sand and rotten dung; cow-dung is most commonly recommended; but they will also thrive in beds of well wrought garden earth, and they often prosper well in the common flower borders.

The season for planting the roots is both in autumn and spring; the autumn plantings generally flower strongest and soonest by a month at least, and are succeeded by the spring planting in May and June. Perform the autumnal planting in October and early part of November, but some plant towards the latter end of September in order to have a very early bloom; but those planted in that month and beginning of October often come up with rank leaves soon after, in winter, so as to require protection in hard frosts; especially in the capital varieties, in order to pre-

serve them more effectually in growth, to flower in best perfection: those however planted about the middle or latter end of October and beginning of November rarely shoot up strong till towards spring, and will not require so much care of covering during winter; and the spring planting may be performed the end of January or beginning of February, or as soon as the weather is settled; they will not require any trouble of covering, and will succeed the autumnal plants regularly in bloom, and will flower in good perfection. Thus by two or three different plantings you may obtain a succession of these beautiful flowers in constant bloom from April till the middle of June; but the autumnal plants for the general part not only flower strongest, but the roots increase more in size, and furnish the best off-sets for propagation: it is however proper to plant both in spring and autumn.

Prepare for the choicer sorts four-foot beds of light earth, as aforesaid, by good digging, breaking the earth fine, but not sift any part thereof, laying them of a moderately rounding form, and rake the surface smooth, then plant the roots in rows lengthwise the beds, either by drilling them in two inches deep and six inches distance in the row, and the rows six or eight asunder, or may plant them by bedding-in or by dibble-planting the same depth and distance. See PLANTING.

Those designed for the borders should be planted generally towards the spring in little clumps or patches, three, four, or five roots in each, putting them in either with a dibble or trowel about two inches deep, and three or four asunder in each patch, and the patches from about three to five or ten feet distance, placing them rather, variedly, forward in the border.

As to their general culture after planting, observe in winter, that such of the forward autumnal-planted roots of the choice sorts in beds as have shot above ground, should, where possibly convenient, have occasional shelter from hard frosts by mats supported on low hoop-arches; or in very severe weather may cover them close with dry long litter, but remove all covering in open weather: and in the spring when the flower-buds begin first to advance, it will be of much advantage to shelter them in frosty nights with supported mats, suffering them however to be open to the full air every day; but the latter plantings that do not come up in winter or very early in spring whilst frosty nights prevail, will not require any protection, and all those distributed in patches about the borders must also take their chance in all weathers; those of the different seasons of planting will succeed one another

in flowering from the beginning of April until the middle of June, though the May blow generally shows to the greatest perfection.

After the blow is past, and the leaves and stalks withered, take up the roots, and dry them in the shade, then clear them from all off-sets and adhering mould, and put them up in bags or boxes till next planting seasons, when they must be planted again as before directed.

But in each season of planting, it is highly necessary, in the principal fine varieties, to plant them either in entire new beds, or the old refreshed with some fresh rich earth or compost, working the old and new well together, this being necessary in order to invigorate the growth of the plants.

Their Propagation.

All the varieties of the *Asiatic Ranunculus* propagate abundantly by off-sets from the root, and new varieties are gained by seed.

By off-sets.—The time for separating the off-sets is in summer when the flower is past, and the leaves and stalks are withered, then taking up all the roots in dry weather, separate the small off-sets from each main root, and after drying the whole gradually in some shady airy room, put them up in bags or boxes in the dry till the autumn and spring seasons of planting, then plant them as before, placing all the off-sets in separate beds, many of them will blow the first year, but in the second they will all flower in good perfection.

By seed.—Save a quantity of seed from the finest semi-double flowers, and sow it either in August or in March or April, though to save trouble of winter covering may defer sowing till spring; it should be sown in light rich mould, either in an east border, or in wide pots placed in a similar situation, sowing the seed evenly on the surface, and cover it in lightly with fine earth; or if in a bed or border, may sow it in shallow flat drills three or four inches asunder, earthing it in similarly: giving frequent refreshments of water in dry weather, and in a month or six weeks the plants will rise with small leaves; observing to continue the light waterings in dry weather to preserve the soil moist during their summer's growth to increase the size of the roots; and in June, when the leaves decay, take up the roots and preserve them till the season for planting, then plant them in common beds, as before directed, and they will flower the spring following, when all the doubles of good properties should be marked, and the singles thrown away.

Culture of the other seven Sorts.

All the other seven species of *Ranunculus* succeed in any common soil and situation, so

may be dispersed about the different flower compartments, where they may constantly remain, only trimming them occasionally; and once in a year or two, or when they have increased into large bunches they may be taken up in autumn or spring to divide them for farther increase, and replant them again directly.

Their propagation is very easy, for they multiply exceedingly by the roots.

So that when intended to propagate them, the roots may be slipped or parted in autumn when past flowering, or in the spring before they begin to shoot, and the slips may either be planted at once where they are to remain, or in nursery rows for a season, then planted out finally.

RAPHANUS, Radish.

The plants are herbaceous, annual esculents of the kitchen-garden, valuable for their eatable roots for spring and summer service, and some for winter eating; having fusiform and globose roots in different varieties, broad rough leaves, and cruciform flowers.

Class and order, *Tetradynamia Siliquosa.*

Characters.] CALYX, four oblong, erect, deciduous leaves. COROLLA, four heart-shaped, spreading, cruciform petals, and four melliferous glands. STAMINA, four long and two short filaments, having simple antheræ. PISTILLUM, an oblong ventricose germen, scarcely any style, crowned by a capitated stigma. PERICARPIUM, an oblong, gibbous, or swelling, smooth, bilocular pod, filled with roundish seeds.

This genus retains three species, one of which only, *Common Radish*, is for our purpose; for the botanists admit but of one species of this sort: all the different varieties of the spindle-rooted and round Radish, both red, purple, white, and black sorts, are supposed varieties only of the same species; and, indeed, we may often observe here and there some of all the varieties degenerate both in shape and colour; however, by care in saving the seeds of the different sorts separate and distant from one another, the different varieties are continued distinct.

The species is,

RAPHANUS sativus.

Cultivated or common Garden Radish.] Hath oblong-taper, and round-orbicular, fleshy roots, crowned by broad, rough leaves; and when they shoot for seed, send forth upright, strong, widely branching stalks, a yard or more high, having all the branches terminated by cruciform, whitish light-purplish flowers, succeeded by taper swelling pods with two cells.

Varieties.] There are several different varieties; though some of them appear as distinct species by the shape, size, and colour of the

root, yet as they all bear exactly the above specific distinction, they are considered all as varieties only of one another, belonging all to the species *Raphanus sativus*, and the principal sorts are the following, which may be divided into two classes,—Common fusiform or spindle-rooted Radishes, and the globular or turnep-rooted kinds.

Common spindle-rooted Kinds in different Varieties.

Short-topped Radish.] Having an oblong, taper, reddish-purple root, some deep, others pale-coloured, crowned with only a small short top of leaves, which is a particular merit peculiar to this sort, as the plants require both less room to grow, and the root swells faster in proportion, attaining perfection much sooner than the large-topped kinds, being also a firm, crisp, tender-eating Radish, so is preferable for general culture, both for all early crops in frames and borders, and for the general crops in the open quarters; the pale rooted sort is generally milder to eat than the deep red or purple kind.

This may be sown at different times, from October or November until May; but from January till March and April is the general sowing season, at two or three weeks' intervals, for the main crops.

Salmon-coloured Radish.] Having a fine long, taper, pale-scarlet root, crowned generally with a pretty large top of leaves, but if allowed room, the root swells freely to a handsome size, and is a firm, crisp, excellent Radish for the later crops, sown in March, April, and May, in open situations.

Variety.] Short-topped early Salmon Radish.

Long-topped Red Radish.] Having an oblong, taper, red root, crowned with a large top of leaves;—not proper for general culture.

Deep-red Radish.] Having an oblong, taper, deep-red root, apt to become soon hot and sticky; not proper for general culture.

Salad Radish.] Any sort of Radish may be used as such, being sown thick like cresses, and mustard, to gather whilst young in the seed leaf, to mix in sallads; but seed of any of the common long-topped sorts may be sown for this purpose. See SALLAD HERBS.

Turnep-rooted Kinds.

Small White Turnep-rooted Italian Radish.] Having a small, round-orbicular, turnep-shaped, white root, being very like young Dutch turneps; and if used whilst quite young, they eat very crisp, mild, and well tasted, and make an agreeable variety at table; are in highest perfection in April and May, or in autumn: sow them in February, March,

and April, for spring and summer use; and in June, July and August, for autumn eating.

This sort is cultivated abundantly about London, and brought to the markets in the spring, March, or April, and in May, June, and in autumn, generally in bunches; having the appearance of young turneps.

Small red Turnep-rooted Radish.] Having a small, round, turnep-shaped, red root nearly similar in shape to the last sort, though often inclining more to the oblongish form than that kind, is generally of a pale red, or sometimes less or more of a deeper colour, and is rather inferior to the former for mildness, and crisp eating; though is very good, and makes an agreeable variety at table.

Black Turnep-rooted Spanish Radish.] Hath a large, roundish-oblong, black-coated root, but white within, greatly esteemed by many for autumn and winter eating either alone or sliced in sallads: and is the hardiest of the Radish tribe to stand the weather for use all winter, &c. should be sown in any open situation, principally in July and beginning of August, they will come in for use in September and October, and continue in perfection all winter.

White Turnep-rooted Spanish Radish.] Having a middling large, round-orbicular, turnep-shaped, white root; proper to cultivate principally for autumn eating and early part of winter, not being so hardy as the black sort, and is not so very generally known or cultivated as that kind; may be sown in June, July, and beginning of August.

Of the above two different classes of Radishes, Spindle-rooted and Turnep-rooted kinds, should generally allot the former for all the principal crops, both early and successional, and smaller portions of the latter sorts as secondaries, which, in the small white, and red kinds, may also be cultivated successionally for spring, summer, and autumn; but the Spanish Turnep-rooted Radishes are principally for autumn, and winter; so that for the general spring, and summer Radishes, allotting the largest supply of the common Spindle-rooted kinds, are proper to sow from the earliest to the latest season, from December or January, until May, June, or all summer; and the small Turnep-rooted sorts, as secondaries, may be sown any time from February or March, till May, or occasionally in summer and autumn, till August or September, and the Spanish Radishes are always sown principally in July and August.

All the varieties of both classes of Radishes are annual plants, which being sown in the spring attain perfection in two or three months, and shoot up soon after into stalk for

flower and seed, which ripening in autumn, the whole plant, root and top, perishes; so that fresh supplies must be raised annually from seed in the spring, and summer, &c. performing the sowings at several different times, from about Christmas until May, or June, of the common Spindle-rooted in particular, or some also of the small Turnep-rooted kinds, in order to continue a regular succession of young tender Radishes throughout the season; allowing only a fortnight or three weeks interval between the sowings; for one crop will not continue good longer than that space of time, before they will either run to seed, or become tough, sticky, and hot to eat.

They are all tolerably hardy, except very early raised plants in their infant state, which are liable to suffer by frost; and they all succeed in any common garden earth, and almost any situation and exposure open to the sun and free air; though for the early crops a warm south border, or other sheltered sunny situation, is proper, both to bring the crop forward, and for protecting the plants from cold, as being impatient of frost whilst young, as abovesaid; therefore when they are sown early, December, or January, &c. it is proper to cover them in frosty nights with straw or mats; but the main crops sown in February and March, &c. may be in any open situation, as they want no protection.

Culture of the common Spindle-rooted Radish.

To have Radishes as early as possible, they are sown both on warm borders and in hot-beds, under frames and lights.

But first of their culture in the open ground. To have early Radishes in warm borders, you may begin sowing a few short-topped Radish in November, and December, but not any general early sowing till about Christmas, or early in January, if the weather is open; or in cold wet grounds not till the end of that month or beginning of February; for the very forward sowings performed before the middle or end of December, are not to be depended on, though such of them as survive the winter's frost, will be fit to draw sometimes in February; they however will be hard and sticky; but as they may be deemed a rarity at a very early season, and as the seed is cheap enough, and a small space of ground will be sufficient, it may be worth the trial to sow some in November and December, and let them take their chance of the winter; and if they should fail, the same ground will do to sow again time enough for a good spring crop. However, for the general early crop, the end of December, or the beginning or middle of January, according to the temperature of the

season, and nature of the soil and situation, in respect to being warmer or colder, is time enough to begin, when, if open weather, it is proper to think of sowing a good crop in a warm dry border, or any warm-lying light ground; and about the end of January, or beginning of February, sow a more general crop.

Let the ground for the reception of the seed be digged or trenched one good spade deep at least; or it will be of advantage, if it has been previously trenched up in ridges, then levelled down, the clods well broken, and the surface laid even.

Then being provided with some good early short-topped Radish-seed, and with which, if you thing proper, you may mix a sprinkling of cos-lettuce, they will come in for use after the Radishes, and be some weeks earlier than the main crops. Sow the whole together broadcast all over the surface tolerably thick in the early sowings, and rake them well in with a large rake; or, if in a large open plat of ground, or considerably wide border, or where the ground is rather wettish, it is proper, for the early sowings in particular, to divide it into four or five feet wide beds, with foot and a half wide alleys between; then sowing the seed, strike it in with the teeth of the rake, and then cast some earth of the alleys over the whole half an inch deep, and rake it smooth.

After performing the main early sowings from about Christmas till the beginning of February, generally cover the ground directly with clean wheat straw, about two inches thick, to keep the surface warm, and keep off birds from the seed, and forward its vegetation, suffering it to remain till the plants are fairly come up, as it contributes to their more early rising, and is then raked off lightly every mild day.

However, covering these early crops is very eligible, both before and after the plants come up, every frosty night; for this purpose have either a quantity of dry wheat-straw, or dried fern, &c. laying it ready in the alleys, and every night, or especially when there is an appearance of frost, throw it over the border or beds with a pitchfork, two inches thick, or more, if the weather should prove severe; and always after the plants are up, rake it off lightly every mild morning with a wooden rake; but in severe weather must remain night and day: and this covering, if carefully spread on and taken off, will no ways bruise the plants, but will not only protect them from the frost, but continue them greatly forward in their growth. But instead of straw some use large garden-mats, especially after the plants are up, to keep off the perpendicular frosts, generally sticking two or three rows of stout

stout wooden pegs along the border or beds, in a slanting manner, two or three inches above ground, to support the mats from the plants, or where there is only a small quantity, you may arch the beds with hoops for the support of the mats.

The above work of covering early Radishes may to some appear tedious and troublesome, but it is soon done when every thing is laid ready, and is universally practised by the London gardeners, to large tracts of ground, continuing it till the plants are fairly in the rough leaf, and firmly rooted; for the early quite young plants, being not only liable to be greatly cut at top by the frost, but even those exposed thereto and seemingly survive, are often started at the root; that is, the frost heaving the ground, it draws the plants up along with it, and breaks the tender radicle or lower perpendicular fibre, which not only retards their growth till they form new fibres, but the terminal downright fibre being broken off, prevents their shooting in length, that they can never form handsome Radishes, but become what the market gardeners call chumps: so those gardeners, who raise large quantities for the supply of the London markets, find their account in allowing the early main crops occasional protection, which by insuring fuller crops, coming in earlier and in greater perfection, always pay them sufficiently for the trouble of covering.

When the Radishes however, are a little advanced in growth, being in the rough leaf, it is proper to thin them, where they stand too thick, to two inches distance, which, as you will begin drawing them for use when quite young, may be room enough at present, as the daily thinning for the table or market will give them more and more room every day.

In very dry weather, in March and April, it is advisable to give them a good watering every evening or morning, which will both forward their growth considerably, increase the size of the root, and render them more crisp and mild to eat.

Continue repeating the sowings every fortnight or three weeks, till March, then sow every fortnight until the end of April: or where a long succession of young Radishes is required, the sowings may be continued all May, or even during the summer, until the middle or end of August, if required; those sown in July or August will be very fine in September and October; observing in sowing the latter crops of Radishes, from the middle of February during the rest of the sowing season, they may be sown in any open ground, and want no covering in any weather; and in the main crops of radishes, if the extent of

ground intended for sowing this main crop is any thing considerable, and that it is necessary to make all possible advantage of every compartment of ground, as is often the case in market gardens, and some others, you may mix a sprinkling of cos-lettuce and round-leaved spinach seed, sowing the whole together broad-cast, and rake them in evenly with a large rake as aforesaid; the three crops will be coming forward all at the same time, without interruption to one another; the Radishes come in first, then, after these are drawn off, the spinach flourishes, and soon becomes fit for use, which is succeeded by the lettuce; and between these may introduce other succession crops, in May or June: however, in the culture of smaller portions, it is not material to sow any other crop with the radishes; and in general it would be preferable to have the whole distinct.

But in sowing the main general crops of Radishes in the open quarters, the market gardeners generally sow them on the same ground where they plant out their main crops of cauliflowers and cabbages, mixing spinach with the Radish seed, as above said, sowing the seeds first, and rake them in, then plant the cauliflowers or cabbages; the Radishes and spinach come in for use before the other plants begin to spread much, and as soon as those small crops are all cleared off for use, then hoe the ground all over to kill weeds and loosen the soil, and draw earth about the stems of the cauliflowers and cabbages.

With regard to the culture of these general crops of Radishes, they require very little, which is occasional thinning where they are too thick, performing this when the plants are come into the rough leaf, either by hoe or drawing them out by hand; though for large quantities, small-hoeing is the most expeditious mode of thinning, as well as prove very beneficial to the crop by loosening the ground; however, in either method, thin the plants to about two or three inches distance, clearing out the weakest, and leave the strongest to form the crop.

Early crops in hot-beds, &c.—When it is required to have young radishes as early in the spring as possible, they may be greatly forwarded by aid of hot-beds under frames and glasses, or other shelters.

This work may be begun any time in winter, if thought proper; but from Christmas till Candlemas is the most eligible season to insure a thriving crop. Make a hot-bed for one or more three-light frames, long-ways, about two feet depth of dung, to furnish sufficient heat to bring up the plants, and set them a going a little at first; put on the frame directly.

directly, and earth the bed six or seven inches deep with light rich mould; then having the true dwarf short-topped Radish-seed, sow it on the surface of the bed moderately thick, and cover it evenly half an inch thick with light mould, and put on the lights, and the plants will come up in a week, or probably in less time, if there is a tolerable warmth in the bed; observing, when they appear, to admit air every day, either by tilting the lights considerably in the front or behind, according to the temperature of the weather, or in fine mild weather take them quite off in the middle of the day; for a large portion of fresh air is necessary every day, otherwise the plants will draw up to shank, and go off; remarking, that after the plants have had a week or fortnight's growth, they should be thinned where they have risen too thick, leaving them about an inch and a half apart; then observing, if the plants have unavoidably drawn up with long shanks, it is advisable to sift some light mould out of a fine sieve in amongst them evenly all over the bed, so as to mould their shanks about half an inch or an inch, or as there shall be occasion: this will greatly strengthen their growth, and promote the goodness of the roots; still remembering to indulge them with a large portion of fresh air every mild day, and cover them on nights; observing likewise, if in the advanced state of the plants, the heat of the bed is considerably declined, it may be proper to revive it by application of a moderate lining to continue a very mild bottom heat, to forward the Radishes in a regular growth: thus, by the above proceedings of culture, the plants will advance fast to perfection, and be fit to draw in six weeks.

But in want of frames and glasses for the above purpose, you may cover occasionally with mats, making the hot-bed as before, and mould it the same depth, securing the sides of the mould with boards or wreaths of strawbands; then cradle or arch it over with hoops or rods for the support of the mats, which must be used every night and all bad weather, till the plants are ready for use.

Or in case of scarcity of dung for making hot-beds as above, you may sow some seed in beds of common earth under garden frames, and put on the lights every night and all bad weather; and thus you may raise the plants for use sooner by a fortnight than in the common open borders.

Culture of the Turnep-rooted Kinds.

Respecting the turnep-rooted Radishes, the small round white, and the red sorts are proper to sow as secondaries, as before intimat-

ed, or as required both for spring, summer, and autumn eating; but the large black Spanish Radish, and white kind, are principally in estimation for autumn and winter, more generally the black sort, as superior both for eating, and hardy to stand the winter weather, and is the most commonly known and cultivated, as was formerly observed; all of which, both of the small and large turnep-rooted kinds, may be sown in any free open situation in lightish ground; or the small white and red sorts sometimes sown in warm borders in spring, to have them earlier, or the white sort occasionally in a hot-bed, to have them in the most early season.

The small round sorts may be sown in spring, in February, March, or beginning of April; or for autumn use, sow them in July, August, and beginning of September; at either season sow them broad-cast thinly, and rake them in evenly, and when the plants come up and get into the rough leaf, they must be thinned either by hoe or hand, setting them out four or five inches asunder.

To obtain them early, sow in a warm border or under a frame, &c. in February; or the white sort in a hot-bed. See the *Culture by Hot-bed*.

The large Spanish turnep-rooted kinds should be sown principally in autumn, about the middle or end of July, in any open situation thinly, and raked in; and when the plants have got rough leaves about an inch broad, hoe them out to six or eight inches distance, they will attain full growth for use in September and October, and continue good great part of winter, particularly the black sort; however, it is proper to take up a quantity in November or December, before attacked by severe frosty weather, and depositing them in any sheltered place in land, they may be kept in good perfection till the spring.

Saving Seed of all the Sorts.

To save Radish-seed, you may either leave some plants of the first main crops to run up, or transplant a quantity into an open spot of ground; the latter is more particularly to be recommended for general practice, because, by drawing up the roots for planting, you can judge of the goodness in respect to shape and colour; they should be planted in an open situation.

The proper season therefore for planting out Radishes for seed is the beginning or towards the middle of May, just when the roots are in their prime, and before they begin to run, chusing showery weather if possible.

Observe of the common taper-rooted Radishes to select them with the shortest tops, and

and the longest straight roots of the best colours in the respective varieties, remarking particularly of the short-topped kind, to chuse them always with the very smallest tops, and as of this sort there being some with roots of a deep reddish-purple colour, and others having pale-coloured clear roots, the latter of which are generally more crisp and mild than the former, and are particularly esteemed about London; so that in drawing them to plant for seed, you should keep them separate, observing also the same of the other varieties: then having previously digged an open space of ground for their reception, plant the Radishes, with their leaves entire, by a dibble, in rows two feet and a half asunder, and the same distance in the lines, placing them in the quincunx order, and each root down to its leaves, directly giving them a good watering, to settle the earth close about the roots, and forward their striking, repeating the waterings in dry weather till they have taken fresh root, and show signs of growth.

As to the turnep-rooted kinds, some should be sown in the spring, about March, purposely for seed, and may either remain where sown, hoeing them out to wide distances, or when the roots are arrived to perfection in May or beginning of June, a quantity may be transplanted, chusing the roundest, best-shaped, fairest roots, and planted in rows two feet and a half asunder, as before observed, and water them.

Observe, however, if any of the large Spanish turnep-rooted kinds of the autumn crops should stand the winter, some may be left, or planted out for seed in February.

All the sorts will soon take root, and shoot up to stalk in June, branch widely every way, flower in July, and the seed will ripen in September.

Their ripening is discovered by the pods and seeds changing brown; then cut up the stalks, and spread them in the sun a week or two to dry and harden the pods and seeds, and then thresh them out; observing the seed-pods being of a tough nature, they do not readily break to discharge the seed, so that sometimes they require to be exposed to the weather some considerable time, to render the husks brittle, and sometimes they require to be threshed two or three times over; when they, however, are threshed out, clean the seed from the rubbish, and put it up in bags out of the way of mice.

RAUVOLFIA,—(*Rauwolfia*.)

A genus furnishing two species of shrubbyish tender exotics of South America, retained in our stove collections for ornamental variety: rising with several ligneous stems, six or

eight feet high; adorned with oblong, shining and downy leaves, in the different species, generally by four in a verticillus round the stem and branches; and funnel-shaped, lateral flowers, having each a five-parted permanent calyx, a tubulous corolla, globose at the base, cut into five at the brim:—five stamina, a roundish germen and one style, succeeded by small globular, bilocular, two-seeded berries.

Class and order, *Pentandria Monogynia*.

The species in our gardens are,

1. *RAUVOLFIA nitida*.

Glossy smooth Rauwolfia.] Having smooth stems; and oblong, narrow, smooth leaves by fours.

2. *RAUVOLFIA canescens*.

Hairy Rauwolfia.] Stems somewhat hairy, or hoaryish, and oblong, broader, hairyish leaves by fours.

These two species are retained in many of our principal hot-house collections, in which they form a distinguishable variety in their verticillate foliage, as well as in their flowers appearing great part of the summer months, succeeded by ripe berries, by which the plants may be raised; sown either in autumn, as soon as ripe, or in the spring; sowing them in pots of light earth, and plunged in a hot-bed; and may also be propagated by layers and cuttings in spring and summer, struck by the same means, or in the bark-bed of the stove; and afterwards have the general culture of other stove exotics of the same nature, and always retained in that department.

REED HEDGES.

Reed Hedges are temporary internal fences made with dried reeds, which may be had cheap enough all over the kingdom, and may be expeditiously formed into Hedges by the assistance of posts and railing, and make a cheap temporary fence of great utility for occasional use in gardens, to inclose particular internal spaces of ground, to afford shelter to certain seedling plants, both in nurseries and large kitchen gardens.

But Reed Hedges are particularly useful in some nurseries, to form places of shelter for many sorts of seedling trees and shrubs, &c. which being tender whilst young, require the shelter of a fence in winter to break off the keen edge of cutting blasts two or three years, till they gradually gather strength and a greater degree of hardiness; and for which occasion, in default of other immediate shelter fences of growing hedges, walls, palings, &c. these may be soon erected as at once to form a fence in any part required; these kind of fences are also useful in nurseries for training several sorts of wall-fruit-trees against, to form

form them for walls in gardens, being what the nurserymen call *Trained Trees*; so that these Reed fences being cheap and soon formed, are often used in the nurseries for a double purpose, that is, serving both for shelter, and affording an opportunity of planting trees against each side, six, eight, or ten feet asunder, for the purpose of training for walls, as aforesaid. See NURSERY, &c.

Likewise in large open kitchen gardens Reed Hedges are often employed to good advantage for sheltering tender plants and early crops; such as inclosing particular spaces for a melonary, or place wherein to raise early melons and cucumbers, and often as cross internal fences, running across the ground at considerable distances, under which forming warm borders for the purpose of raising various early crops of esculents more plentifully; serving also to break the force of cutting and tempestuous winds from the crops in the adjacent quarters, and for which purposes many of the kitchen-gardeners about London use these kind of Hedges.

Remark however, these Reed Hedges are not at all adapted for outward fences, as they may be very easily broke through.

But as internal fences for sheltering plants, they are accounted better than walls or pales, because the Reeds generally deaden the winds without reverberating them back again.

The proper Reeds for making these fences are the dried stems of the *Arundo Phragmitis*, or Common Marsh Reed, growing in great abundance by river sides, and in lakes, and marshy places all over the kingdom, furnish a crop of stems annually fit to cut in autumn, and being then bound in bundles, are stacked up or housed to remain for use; great quantities are annually brought to London by water, and deposited in warehouses near the river, where they have great demand for them for the above and some other purposes.

As to the method of making these fences, they are sometimes erected in fixed ranges, and sometimes formed into movable pannels. When to be formed into fixed fences, arrange some stout posts six or eight feet asunder, and five or six high, and from post to post carry two or three ranges of flat thin railing, one range near the bottom, another near the top, and a third in the middle; against this railing place the reeds about two inches thick, having other railing fixed directly opposite, so that the Reeds being placed all along between the double railing, the bottoms resting either upon a plate of wood, or let into the ground, as may be convenient; but

the former is preferable for preserving the bottom part from rotting: and as soon as one pannel is formed, nail the railing as close as possible, and either drive some long spike nails through each double railing, or bind them with strong withy bands, or tar rope-yarn, but nailing is the best, in order to bring them as close as may be, to secure the Reeds firmly in the proper position; and thus proceed till you have completed the range of fencing, the top cut even.

But when intended to have any of these fences formed into movable pannels, to remove to different places occasionally, a framework of railing is prepared as above, each pannel six or eight feet long, and the Reeds fixed therein as before directed; then where-soever it is intended to place them, posts must be ranged six or eight feet distance, to support the several pannels.

Or sometimes the movable pannels are used to defend tender young plants, in narrow borders under walls, &c. placing the pannels inclining against the wall or other fence, in time of severe weather.

RESEDA, Bastard Rocket, *Mignonette*, &c.

It consists principally of herbaceous annuals, biennials, and perennials; some of the biennials in particular merit culture, one as an odoriferous garden plant, another for field culture, for the use of the dyers, &c. growing from one to three feet high, having oblong and lanceolate leaves, and terminated by spikes of small unequal flowers.

Class and order, *Dodecandria Trigynia*.

Characters.] CALYX is monophyllous, many-parted, and permanent. COROLLA, several small, unequal, generally trifid petals, the upper being gibbous at the base, containing a honey juice; and a glandular, plane, erect nectarium at the upper side of the receptacle, between the stamina and upper petal, connivent with the base thereof. STAMINA, twelve or fifteen short filaments, having obtuse erect antheræ. PISTILLUM, a gibbous germen, three or more very short styles, having simple stigmas. PERICARPIMUM, a gibbous, angular, unilocular capsule, with apertures between the styles, having many kidney-shaped seeds adhering to the angles of the capsule.

There are many species, the most noted of which, for our purpose, are the two following, the first for the pleasure-ground, the other for field culture.

1. RESEDA *odorata*—(annual-biennial and tender.)

Odoriferous Reseda, commonly called Mignonette.] Hath a tough fibrous root, sending

forth several weak branchy stalks, growing eight or ten, to twelve or fifteen inches long, having oblong, entire, and trilobate leaves, and all the branches terminated by long spikes of greenish-white sweet-scented flowers, having the calyx equal with the petals.

This plant is annual and biennial, is in high estimation for its agreeable fragrance, though is not ornamental neither in its growth nor flowers, but the latter impart a most delightful odour widely around, flowering in summer, continuing several months, even all the winter, if sheltered in a green-house, &c.

Is a native of Egypt; succeeds here in the open air in summer, but requires shelter in winter.

2. RESEDA *Luteola*—(biennial and hardy.)

(*Luteola*)—*Yellow Herb, called Weld, Wild Woad, or Dyer's Weed.*] Hath tough fibrous roots, crowned with long, narrow, spear-shaped, entire leaves, spreading on the ground, upright stems a yard high, garnished also with spear-shaped narrow leaves, and terminated by long loose spikes of yellow flowers, having quadrifid cups; grows wild on old walls and the sides of banks and sterile places in England, &c. but is cultivated in fields for its flower-stems, for the use of the dyers.

Both these species are biennial plants: the first is somewhat tender, requiring shelter from frost: but the second is very hardy; observe however the first sort may be deemed annual as well as biennial; for being sown early in spring, will flower and perfect seeds the same year, and totally perish in winter, if not sheltered; being sheltered all winter in a green-house, it will continue till next summer; it however may more generally be considered as an annual: but the second sort is perfectly biennial; for being sown one year, it does not run up to stalk till next summer, when it flowers and ripens seed, and wholly decays soon after.

Method of Propagation.

They are both raised from seed sown annually, the first sort principally in a hot-bed, or warm border; the other in the open ground.

The first sort, odoriferous Reseda, or Mignonette; being an exotic of somewhat tenderish quality, is generally ranked among the tender annuals, and as such is commonly raised in a hot-bed in the spring, whereby to have the plants flower as early as possible in summer; but for a common general blow, it may also be sown in a bed, border, or pots of natural earth in April, or sooner in pots under shelter: however, when required to have an early bloom for the sake of its fragrance, in

which consists the whole merit of this diminutive plant, some seed should be sown in March or April, in any moderate hot-bed, as directed for tender annuals, sowing some in small pots to remain, and some for transplantation into the full ground, in the end of May or June; however, whilst they remain in the hot-bed, indulge them with fresh air daily, and occasional waterings in common with the other plants; and if some, when advanced an inch or two in growth, are pricked upon a fresh hot-bed, or into small pots, three or four plants in each, and plunged in the hot-bed, it will forward them considerably: in May or in June, according to the strength of the plants and temperature of the season, taking opportunity of mild moist weather, remove them into the full air, retaining some in pots, others transplant with balls into the borders, observing, when the stalks of the plants advance, to place short sticks for their support, and to which tie the stems in a neat manner.

Or in want of a hot-bed, some seed may be sown in one or more middling small pots in March or April, placed under a frame and lights, or hand-glass, or some other protection occasionally, of nights and cold spring weather; it will forward the plants in growth for earlier flowering than if raised entirely in the open ground exposed wholly to the full air; and may afterwards be managed as above.

But the seed of this plant will also grow in the full ground, sown in the middle of April and in May, when the season is become warm and settled, sowing them in light earth, either in a bed by themselves, and raked in lightly, or in patches about the flower-borders, covering them a quarter of an inch deep; and in either method the plants may mostly remain where raised, or some transplanted, as thought expedient, giving occasional waterings.

And if some plants are raised in pots in May, or any time in summer, or towards autumn, and the pots plunged in an east border, or where they may have only the morning sun, well watered all summer, and in October placed in a green-house, glass-case or garden-frame, they will stand the winter, and some of them raised forward in the summer, will flower all the winter season, others raised towards autumn, will continue increasing in growth, and flower strong early next spring and summer.

They ripen seeds in September, when they should be carefully gathered in dry weather.

The culture of the Weld, or Woad, is generally in large quantities in fields, and thrives in any poor land, though it will consequently be more prosperous in a rich soil; the beginning

ning of August is the best season for sowing it, allowing about one gallon to an acre, and sow it broad cast evenly, and harrow it in; the plants will soon come up the same season, and when they are a little advanced in growth, hoe them to thin the crop and kill weeds, leaving the plants six inches asunder; they will shoot up into stalk next spring, and flower in June, at which time the plants should be pulled for use, laid to dry, then tied in bundles and housed.

A quantity of the plants should be suffered to stand every year for seed.

RHAMNUS, (*Cerva spina*) Buckthorn.

The plants are of the tree and shrub kind, comprising several deciduous and evergreen species for adorning the pleasure-ground and green-house collection, garnished with oval and oblong leaves, and small monopetalous, infundibuliform flowers mostly in bunches, succeeded by small round berries.

Class and order, *Pentandria Monogynia*.

Characters. CALYX, none. COROLLA is monopetalous, funnel-shaped, four or five-parted, and spreading, having a small scale at the base of each division. STAMINA, five, or generally as many filaments as there are divisions in the corolla, inserted under the squamulae or scale of the petal, and terminated by small antherae. PISTILLUM, a roundish germen, filiform style, crowned by an obtuse stigma, and divided into fewer segments than the corolla. PERICARPIUM, a round naked berry of three or four cells, having the like number of roundish hard seeds.

Late improvements in botany have ranged several genera of former authors as species only of this genus, such as the *Frangula*, or Berry-bearing Alder—*Paliurus*, or Christ's Thorn—*Alaternus*—and *Zizyphus*, or Jujube-tree; all of which bearing the *characters* exactly of *Rhamnus*, are to be now considered as species of that genus.

They consist of deciduous and evergreen kinds, mostly of hardy growth, and some of tender quality.

Hardy deciduous Kind.

Under this head is comprised the common Buckthorn, *Frangula*, and *Paliurus*.

1. RHAMNUS *catharticus*.

Cathartic, or Common Purgine Buckthorn.

Grows twelve or fourteen feet high, branching numerous and irregularly, smooth, and armed with terminal spines, oval-spear-shaped, sawed, smallish leaves, on long foot-stalks, and at the sides of the branches clusters of small, quadrifid, greenish flowers, succeeded by black berries in autumn, having four seeds.

Varieties. Dwarf Buckthorn, growing a-

bout a yard high.—Dwarf long-leaved Buckthorn, growing five or six feet high.

The common sort grows wild in hedges in many parts of England, but is admitted for variety in the shrubbery plantations; the berries of it are used in medicine, being made into a syrup, good for many disorders, given as a cathartic or purge, said to be good to purge watery humours, and against the dropsy, jaundice, itch, and all eruptions of the skin, &c.

2. RHAMNUS *Frangula*.

(*Frangula*) or Common Berry-bearing Alder.]

Rises with a woody stem, branching numerously ten or twelve feet high, without thorns; oval-spear-shaped, entire leaves, two inches long; and small, greenish flowers, terminating the shoots in clusters; succeeded by round berries, ripening to a black colour in autumn, having generally but two or three seeds.

Varieties. Dwarf Berry-bearing Alder, growing two or three feet high—Dwarf long-leaved.

The common sort is an inhabitant of our woods in many parts of England, but has been long admitted in garden plantations, to increase the variety of hardy deciduous shrubs.

3. RHAMNUS *alpinus*.

Alpine rough-leaved Berry-bearing Alder.

Rises with a woody stem, branching numerously twelve or fourteen feet high, without thorns; larger oval-spear-shaped rough leaves, doubly crenated; and flowers in small clusters.

Variety. Smooth-leaved Alpine *Frangula*.

4. RHAMNUS *Paliurus*.

(*Paliurus*) or Christ's Thorn.]

Rises with a shrubby stem, branching ten or twelve feet high, having numerous weak pliant branches, armed with sharp thorns by pairs, at every joint, having the lower one reflexed; oval leaves alternately, near an inch long, and trigynous yellowish flowers in clusters at the axillas of the branches, succeeded by small, roundish, compressed berries, surrounded by a membranous border.

It grows naturally in Palestine; also in Spain, Portugal, and some parts of France, and is retained here in our shrubberies as a curiosity, as being supposed to be the plant of which the crown of thorns was composed, to place on the head of our Saviour at his crucifixion, the probability of which is supported by accounts of some travellers, by observing that the shrub grows naturally in great plenty about Jerusalem and in Judea.

5. RHAMNUS *lineatus*.

Lineated-leaved Chinese Rhamnus, or Supple Jack. Slender pliant branches without thorns,

6 l. 2

ovate,

ovate, lineated, or line-marked, repand leaves, netted underneath.

Most of the above deciduous species flower about June, but the flowers are not ornamental, being small and mostly of a greenish colour, which in the first three species are succeeded by abundance of berries in autumn, effecting a tolerable variety; but the *Paliurus* rarely ripens its berries in England.

They are all hardy shrubs, and will prosper in any common soil, and may be planted to increase the variety of the shrubbery and other hardy plantations.

They are propagated by seed and by layers, and sometimes by cuttings.

By Seed.—In autumn, or as soon as the seeds can be procured after they are ripe, sow them in light earth, covering them near an inch deep; they sometimes rise the spring following, if sown early in autumn; otherwise are apt to remain a year longer in the ground; when however the plants are a year or two old, plant them out in nursery-rows, to have two or three years' growth, and then may be planted out finally.

By Layers.—Choose the young shoots in autumn, and give them either a little twist or nick in the bark at a joint, then lay them in the usual way; they will be rooted in one year.

By Cuttings.—The first three sorts in particular grow by this method; choose the young twigs for cuttings in autumn, and plant them in rows; most of them will strike.

Evergreen Kinds.

Of these sorts there is but one species common to our gardens, which was formerly a distinct genus (*Alaternus*), but now a species of *Rhamnus*, and comprehends several varieties—all beautiful, hardy, evergreen shrubs.

6. RHAMNUS *Alaternus*.

Alaternus, commonly so called.] Rises with a shrubby upright stem, branching numerously all the way from the bottom, four or five to twelve or fifteen feet high, the branches having a smooth, greenish and reddish bark, closely garnished with oval, stiff, shining green, serrated leaves, placed alternately, and at the axillas diœcous greenish flowers in clusters, with three-parted stigmas, succeeded by round soft berries in autumn, having three seeds.

It is a native of the southern parts of Europe.

Varieties.] Large-growing *Alaternus*—Small-growing *Alaternus*—Broad-leaved *Alaternus*—Narrow-jagged-leaved *Alaternus*—Gold-striped-leaved—Silver-striped-leaved—Blotched leaved—Yellow-striped jagged-leaved—White-striped jagged-leaved—All of which

are evergreen shrubs, varieties of the same species, and of hardy growth, succeeding in any common soil in the open shrubberies and other plantations, and exhibit a very ornamental appearance the year round.

This species and the *Phillyrea* bearing a great external resemblance, are often mistaken for one another; but the *Alaternus* in all its varieties have the leaves placed alternately, and the *Phillyrea* in pairs opposite, so that there is a very obvious distinction, besides being of different genera by the characters of their flowers and fruit. See PHILLYREA.

All the varieties of the *Alaternus* are very ornamental evergreens for adorning the shrubbery compartments, and if the plain green sorts and variegated kinds are intermixed in assemblage with other evergreens, they will effect a very distinguishable variety at all seasons: these plants were also formerly used for ornamental hedges, and at present are often employed to form hedges as blinds to hide any naked wall, or other disagreeable fence, &c. in fore-courts and other conspicuous places contiguous to the dwelling; the variegated kinds being mostly esteemed for this purpose, or the green and striped sorts intermixed alternately, will effect an agreeable variety; which being planted close against the fence, two or three feet asunder, and their branches nailed thereto, they will soon cover it effectually.

They are propagated by seed and by layers; the plain green sorts may be raised by both methods, but the variegated sorts by layers only, whereby to continue them the same with certainty.

By Seed.—The berries ripening abundantly in September or early part of October, should be gathered and sown as soon after as possible; otherwise they will hardly come up till the second spring. Sow them in beds of light mould an inch deep; they will probably some come up in the spring; but if not, keep the beds weeded, and they will all come up the spring following; which, after having two years' growth, transplant them in March in nursery rows, to remain till wanted for the shrubbery, &c.

By Layers.—All the sorts may be raised this way, which is the only certain method to continue the variegated sorts. Choose the young shoots of the year in autumn, give them a slit at a joint, and lay them; they will be most of them well rooted by the autumn following; then take them off and plant them in the nursery way, to have two or three years' growth.

Green-house and Stove Kinds.

Consist principally of some species of *Zizyphus*,

zyphus, formerly a genus of itself, but now ranged in the family of *Rhamnus*; and the following are cultivated in some gardens for variety.

The two first are green-house plants, and the other two for the stove.

7. RHAMNUS *Zizyphus*.

Common Zizyphus, or Fijube tree.] Rises with a woody stem, branching irregularly eight or ten feet high, armed with straight prickles by pairs; oval, oblong, smooth leaves, and small digynous, close-fitting, yellow flowers, succeeded by large oval berries.

8. RHAMNUS *Fujuba*.

Indian Fijube Tree.] Rises with a shrubby stem, branching eight or ten feet high, armed with solitary or singly-placed recurved spines, roundish retuse leaves, downy underneath, and aggregate pedunculi supporting small, semi-digynous, yellowish flowers, succeeded by large round berries.

9. RHAMNUS *Spina Christi*.

African Christ's Thorn, or Fijube.] Rises with shrubby stems, dividing into slender branches, armed with straight sharp spines by pairs; oval leaves, and small yellowish flowers.

10. RHAMNUS *Cenoplia*.

Ceylon Fijube.] Rises with a woody stem, branching eight or ten feet high, armed with solitary recurved spines; roundish heart-shaped leaves, and aggregate almost close-fitting pedunculi supporting yellowish flowers.

Of the above four kinds, the two first are for the green-house collection, the other two for the stove; so must always be kept in pots, and placed among the plants of those departments.

They are propagated by sowing the stones of the fruit in pots, and plunged in a hot-bed.

Likewise by suckers from the root and by layers.

RHEUM, Rhubarb.

The plants are luxuriant herbaceous perennials, of tall upright growth; for variety in gardens and medical purposes; having very thick, fleshy, branched roots, crowned with singularly large, simple, spreading foliage, one or two feet in length and breadth; and strong erect annual stalks, from about three to six or eight feet high, terminated by large spikes of numerous small six-parted flowers.

Class and order, *Enneandria Trigynia*.

Characters.] CALYX, none; or otherwise appears as the COROLLA, monopetalous, narrow at the base, and impervious, divided above into six parts, alternately smaller. STAMINA, nine capillary filaments inserted into the corolla, and terminated by oblong didymous antheræ. PISTILLUM, a short triquetrous ger-

men, three scarcely visible styles, and three reflexed plumose stigmas. PERICARPIUM, none; one large, triquetrous, acute seed to each flower, having a membranous border.

There are about six species, all herbaceous and of foreign growth, but grow freely here in the open ground. Are in great estimation as very salutary medical plants, the root being the useful part, which, however, in one or two sorts is of superior quality; one in particular, the *Rheum palmatum*, is esteemed superior to all the others.

1. RHEUM *Rhaponticum*.

Rhapontic, or Common Rhubarb.] Hath a large, thick, fleshy, branching, deeply-striking root, yellowish within, crowned by very large, roundish-heart-shaped, smooth leaves, on thick, slightly-furrowed footstalks; and an upright strong stem, two or three feet high, adorned with leaves singly, and terminated by thick close spikes of white flowers.

It grows in Thrace and Scythia, but has been long in the English gardens; its root affords a gentle purge; is, however, of inferior quality to some of the following sorts; but the plant being astringent, its young stalks, and foot-stalks of the leaves in spring being cut and peeled, are used for tarts.

2. RHEUM *palmatum*.

Palmated-leaved True Chinese Rhubarb.] Hath a thick fleshy root, yellow within; crowned with very large palmated leaves, being deeply divided into acuminate segments, expanded like an open hand; upright stems, five or six feet high or more, terminated by large spikes of flowers.

This is now proved to be the true foreign Rhubarb, the purgative quality of which is well known.

3. RHEUM *compactum*.

Compact thick-leaved Tartarian Rhubarb] Hath a large, fleshy, branched root, yellow within, crowned by very large heart-shaped, somewhat lobated, sharply indented, thick smooth leaves; and an upright large stem, five or six feet high, garnished with leaves singly, and branching above; having all the branches terminated by nodding panicles of white flowers.

This has been supposed to be the true Rhubarb, which, however, though of superior quality to some sorts, is accounted inferior to the *Rheum palmatum*.

4. RHEUM *undulatum*.

Waved-leaved Chinese Rhubarb.] Hath a thick, branchy, deep-striking root, yellow within, crowned with large, oblong, undulate, somewhat hairy leaves, having equal footstalks, and an upright firm stem, four feet high, garnished

nished with leaves singly, and terminated by long loose spikes of white flowers.

5. RHEUM *Ribes*.

(*Arabian Ribes*) or *Granulated, Warted-leaved Persian Rhubarb*.] Hath a thick fleshy root, very broad leaves, full of granulated protuberances, and with equal footstalks; and upright firm stems, three or four feet high, terminated by spikes of flowers, succeeded by berry-like seeds, being surrounded by a purple pulp.—This is a plant of curious singularity.

6. RHEUM *tataricum*.

Tartarian Heart-leaved Rhubarb.] Having heart-ovate, plane, smooth leaves; the petioles half cylindric-angled.

All these plants are perennial in root, and the leaves and stalks are annual; the roots being thick, fleshy, generally divided, strike deep into the ground; of a brownish colour without, and yellow within; the leaves rise in the spring, generally come up in a large head folded together, gradually expanding themselves; having thick foot-stalks, and grow from one to two feet or more in length and breadth, spreading all round; amidst them rise the flower-stems, which are garnished at each joint by one leaf, and are of strong and expeditious growth, attaining their full height in June, when they flower; and are succeeded by large triangular seeds, ripening in August.

Some plants of each sort merit culture in gardens both for variety and ornament; they will effect a singularity with their luxuriant foliage, tall stems, and large spikes of flowers; and may be cultivated in any common soil in beds, borders, or other compartments; planted in autumn or spring.

And as medical plants, they demand culture both for private and public use, they being eminently salutiferous on many occasions; and for which several of the sorts are indifferently used, though the Rhaphontic kind is the most generally cultivated in our gardens for that purpose, and hence is commonly called English Rhubarb; however, most of the sorts may be used similarly; and some are of superior virtue, such as the *Rheum palmatum*, before observed, very distinguishable from the others by its palmated-divided leaves.

They are propagated by seeds sown in autumn soon after they are ripe, or early in the spring, in any open bed of light deep earth; remarking, those intended for medical use should generally be sown where they are to remain, that the roots, being not disturbed by removal, may grow large; scatter the seeds thinly, either by broad-cast all over the surface, and raked well in; or in shallow drills

a foot and half distance, covering them near an inch deep. The plants will rise in the spring, but not flower till the second or third year; when they, however, are come up two or three inches high, thin them to eight or ten inches, and clear out all weeds; though those designed always to stand, should afterwards be hoed out to a foot and a half or two feet distance; observing, if any are required for the pleasure-ground, &c. for variety, they should be transplanted where they are to remain, in autumn when their leaves decay, or early in spring before they shoot; the others remaining where sown, must have the ground kept clean between them; and in autumn when the leaves and stalks decay, cut them down, and slightly dig the ground between the rows of plants, repeating the same work every year.

The roots remaining, they increase in size annually; and in the second or third year many of them will shoot up stalks, flower, and perfect seeds; and in three or four years the roots will be arrived to a large size; though older roots are generally preferable for medical use.

RHEXIA, American Soap-wort.

Consists of hardy herbaceous perennials for the pleasure-ground, rising with stalks a foot high, garnished with spear-shaped leaves, and terminated by tetrapetalous, spreading, red flowers.

Class and order, *Ostendria Monogynia*.

Characters.] CALYX is monophyllous, tubular, ventricose below, four-parted above, and permanent. COROLLA, four roundish patent petals. STAMINA, eight slender filaments inserted in the calyx, having declinated, linear, obtuse, versatile antheræ. PISTILLUM, a roundish germen, simple style, and oblong thick stigma. PERICARPIUM, a roundish, quadrilocular, quadrivalved capsule, in the belly of the calyx, having numerous roundish seeds.

There are several species: those of our gardens are the two following, both of America.

1. RHEXIA *virginica*.

Virginia Rhexia.] Rises with an erect tetragonous stalk above a foot high, garnished with spear-shaped, serrated, sessile, opposite leaves; and the stalks terminated by forked pedunculi, crowned with red flowers, having smooth cups.

2. RHEXIA *mariana*.

Maryland Rhexia.] Rises with erect stalks, ten or twelve inches high; having spear-shaped, ciliated, opposite leaves, and the stalks terminated by pedunculi, crowned with red flowers.

They

They both flower in June, but rarely ripen seeds here.

These perennials succeed here in the open ground all the year, in a dry sheltered place, though it is proper to keep some also in pots, to move under shelter in very severe frosts.

They are propagated by seed sown in autumn, or spring, in pots, to be sheltered from frost; or if placed in a hot-bed in March, it will forward their growth; and when the plants are two or three inches high, plant them out.

RHODIOLA, Rose-root.

It is a low, herbaceous, succulent, odoriferous perennial, for variety in the pleasure-ground, having succulent leaves and stalks, and tetrapetalous diœcious flowers.

Class and order, *Diœcia Octandria*.

Characters.] CALYX, male and female flowers distinct on two separate plants, having monophyllous, erect, four-parted, permanent cups. COROLLA, in the males, four oblong obtuse petals longer than the calyx, and deciduous; with four erect nectariums, shorter than the calyx; and in the females, four obtuse petals, equal with the calyx and permanent, with three or four nectariums like the males. STAMINA, eight subulate filaments longer than the corolla, having simple antheræ. PISTILLUM, four oblong acuminate germens, straight simple styles, having obtuse stigmas. PERICARPIUM, four corniculate capsules opening in the inner side, and many roundish seeds.

There is only one species, grows wild on mountainous parts in England, &c. but has been long a resident of gardens, viz.

RHODIOLA rosea.

Rose-root.] Hath a fleshy, thick, knotty root emitting an odour like roses; sending up annually erect succulent stalks, eight or ten inches high, garnished with numerous, oblong, thick, succulent, serrated leaves, alternately; and terminated by clusters of yellowish-green flowers.

It flowers in June, and the seeds ripen in autumn.

This plant delights in a dry soil, and may be planted in any of the common borders, where it will abide for years.

It is propagated both by parting the roots in autumn or spring, and by cuttings of the stalks, which being cut off early in the summer, laid in a room a week to dry the succulency of the cut; then plant them in a shady border, and if covered close with a hand-glass, they will strike in less than two months.

RHODODENDRON, Dwarf Rose-bay.

It comprises hardy, deciduous, and beautiful

evergreen flowering shrubs for ornamenting the shrubbery and other pleasurable plantations, growing two or three to eight or ten feet high; garnished with lanceolate and oval leaves, and wheel and funnel-shaped flowers in clusters at the ends of the branches.

Class and order, *Decandria Monogynia*.

Characters.] CALYX is five-parted and permanent. COROLLA is monopetalous, wheel or funnel-shaped, five-parted, and spreading at top. STAMINA, ten declinated filiform filaments, having oval antheræ. PISTILLUM, a pentagonous retuse germen, slender style, and obtuse stigma. PERICARPIUM, an oval quinquelocular capsule, having numerous small seeds.

There are about nine species, the principal of which, in the English gardens, are the following deciduous and evergreen kinds.

Deciduous Kinds.

1. RHODODENDRON ferrugineum.

Ferrugineous Alpine Rhododendron.] Rises with a shrubby stalk, branching irregularly three or four feet high; closely garnished with smallish, spear-shaped, smooth leaves, ferrugineous or iron-coloured underneath; and clusters of funnel-shaped red flowers at the ends of the branches.

2. RHODODENDRON hirsutum.

Hairy Alpine Rhododendron.] Hath a shrubby stem, branching numerously about two feet high; oval-spear-shaped, ciliated, naked leaves, having many iron-coloured hairs underneath, and clusters of funnel-shaped pale-red flowers at the end of the branches.

3. RHODODENDRON Chamæcisus.

Dwarf Rose-bay of Mount Baldi.] Hath a shrubby stem, branching numerous and irregularly two or three feet high; small, oval-spear-shaped, ciliated leaves, and clusters of wheel-shaped flowers at the end of the branches.

Evergreen Kinds.

4. RHODODENDRON maximum.

Large American Laurel-leaved Rhododendron.] Rises with a shrubby stem, branching eight or ten feet high; large, oval, obtuse, veined, shining, green leaves, the margin acutely reflexed, and pale-red flowers at the ends of branches, each pedunculi having but one flower.

Grows naturally in Virginia.

5. RHODODENDRON ponticum.

Pontic Dwarf Rose-bay.] Grows four or five feet high, spear-shaped, smooth, shining leaves, and the branches terminated by clusters of bell-shaped purple flowers.

It grows naturally in humid places in the East, and about Gibraltar.

All these shrubs, both deciduous and evergreen kinds, flower mostly in June; the flow-

ers are monopetalous, funnel and wheel-shaped, in different species, cut at top into five segments; and are sometimes succeeded by seed here in England, especially the second, third, and fourth sorts; the other but seldom.

The plants are all of foreign growth, residents mostly of mountainous, rocky, shady places; and the last generally in moist situations.

They may all be employed to adorn the shrubbery, in which they will appear very ornamental; will grow in any common soil of our gardens as most other shrubs, or sometimes superiorly in soils and situations nearly similar to that where they naturally grow.

They are raised commonly from seeds sown in autumn, or as soon as they can be obtained, in a shady border; the seeds being very small, make the surface of the ground smooth; sow them thereon evenly, and cover them very lightly with fine mould; they will come up in the spring; and after a year's growth, prick them out into a shady situation.

Their propagation may also be tried by layers of the young wood.

RHUS, Sumach and Toxicodendron, &c.

This genus comprehends many species of the tree and shrub kind, for the shrubbery, green-house, and stove; obtaining from five or six, to ten or twelve feet stature; garnished mostly with pinnate and trifoliate leaves, and pentapetalous flowers, mostly in clusters at the ends and sides of the branches.

Class and order, *Pentandria Trigynia*.

Characters.] CALYX is monophyllous, five-parted, and permanent. COROLLA, five oval, erect, patent petals. STAMINA, five very short filaments and small antheræ. PISTILLUM, a roundish germen as large as the corolla; scarcely visible styles, but three small heart-shaped stigmas. PERICARPIUM, a roundish unilocular berry, some hairy, others smooth in different species, having a roundish hard seed.

To this genus is now added the *Toxicodendron*, or Poison tree.

There are, of the *Sumachs* and *Toxicodendrons* together, about eighteen species, all of which are of the tree and shrub kind, of foreign growth, of different parts of the world; consisting of several hardy deciduous kinds for the shrubbery; several tenderer sorts for the green-house; and one for the stove; the most material species found in the English gardens, are the following.

Hardy Sumach deciduous Kinds.

1. *RHUS Coriaria*.

Tanner's Sumach.] Hath a strong woody

stem, dividing and branching irregularly, ten or twelve feet high; having a brownish hairy bark; large pinnated leaves, of seven or eight pair of oval bluntly-sawed lobes, terminated by an odd one, and hairy underneath; and large paniculated spikes of whitish flowers at the ends of the branches.

It grows wild in the south of Europe and in Turkey, where the branches are used instead of oak-bark for tanning leather.

2. *RHUS typhinum*.

Stag's Horn Virginia Sumach.] Hath a shrubby stem, branching irregularly eight or ten feet high, having crooked spreading branches, dividing into thick shoots, covered with a soft velvety down, and resemble the form, colour, and texture of a young stag's horn; pinnated leaves of six or seven pair of spear-shaped acutely-sawed lobes, terminated by an odd one, and downy underneath; and at the ends of the branches, large tufts of flowers, succeeded by close downy clusters of purple seeds, having a singular appearance in autumn and winter.

Variety.] Dwarf Stag's-Horn Virginia Sumach.

3. *RHUS glabrum*.

Smooth American Sumach.] Consisting of the three following varieties.

New England Smooth Sumach.] Rises with a shrubby stem, branching irregularly from the bottom and sides, twelve or fourteen feet high; having spreading branches, dividing into very thick, somewhat downy, smooth, brown shoots; large pinnated leaves, of ten or more spear-shaped lobes, and an odd one, smooth on both sides; and large loose panicles of greenish flowers at the ends of the branches.

Carolina Smooth Scarlet Sumach.] Grows eight or ten feet high, with smooth purple branches, dusted with a greyish powder; long, pinnated, smooth leaves like the other, and the branches terminated by large scarlet panicles of flowers.

Canada Smooth Red Sumach.] Grows eight or ten feet high, having a purplish bark, tinged with a whitish powder; long pinnated smooth leaves, of a shining green above, and whitish underneath; and the branches terminated by large panicles of red flowers.

4. *RHUS Copallinum*.

Lentiscus-leaved American Sumach.] Rises with a shrubby stem, dividing into spreading, smooth, brown branches, four or five feet high; pinnated leaves, of four or five pair of entire lobes, terminated by an odd one; having a membranaceous border running along the footstalk in joints, and large loose panicles of greenish flowers at the ends of the branches.

Variety.

Variety.] Canada Lentiscus-leaved Sumach, growing eight or ten feet high, and larger pinnated leaves.

5. RHUS *Cotinus*.

(*Cotinus*)—or *Venetian Sumach*.] Rises with a shrubby irregular stem, branching widely, about ten feet high, having a smooth brown bark; oval, simple, shining-green leaves; and the branches terminated by long hair-like pedicels, dividing into long slender bunches of small purplish flowers.

In Italy and Spain, where this shrub grows naturally, they use the bark for tanning leather.

Hardy Toxicodendron Deciduous Kinds.

These are of the shrub kind and deciduous, natives mostly of America; were formerly ranged as a distinct genus, (*Toxicodendrum*) but are now made species of *Rhus*; most of the sorts abounding with a milky poisonous juice, obtain the appellation of Poison-tree in America, where they grow naturally in great abundance.

6. RHUS *Toxicodendron*.

Common American Toxicodendron, or Poison-Oak.] Hath a low shrubby stem, branching about three feet high, the lower ones trailing and rooting in the ground; ternate or three-lobed leaves, having roundish, angulated, and sometimes entire lobes, generally a little downy; and loose panicles of small whitish flowers at the sides of the branches, succeeded by whitish berries in autumn.

Varieties.] Smooth-leaved—downy-leaved—upright-growing.

7. RHUS *radicans*.

Radican American Toxicodendron.] Rises with a shrubby stem, branching four or five feet high, having trailing, radican, or rooting branches; ternate smooth leaves, with oval entire lobes, petioled; and short spikes of greenish flowers, succeeded by roundish berries in autumn.

Variety.] With upright branches.

8. RHUS *Vernix*.

Varnish Tree, or Pinnated-leaved American Toxicodendron, or Poison-Ash.] Rises with a strong woody stem, branching thinly on every side, seven or eight feet high: pinnated leaves of three or four pair of oblong entire lobes, and an odd one; and at the axillas, loose panicles of small greenish flowers, and roundish berries, not ripening here. The milky juice of this tree being remarkable for staining, is supposed to be the true Varnish-Tree, from which the varnish is collected.

All the above eight hardy species being deciduous, produce their leaves in spring, and shed them in the autumn.

They flower here mostly in June and July, for the general part in clusters and panicles; each cluster composed of numerous small pentapetalous flowers, succeeded in some sorts by seeds, ripening in September.

The plants are all proper furniture for shrubberies, and other ornamental plantations, to increase the variety of the deciduous collection; they may be planted in any open compartments, in assemblage with other hardy deciduous shrubs, and they will effect a very agreeable diversity in summer, and some sorts also in autumn and winter; particularly some of the Sumach kinds, with their stag-horn, brown, velvety branches, and their large red panicles.

Observe, as several of the Sumachs abound in suckers from the root, and some of the *Toxicodendrons* increase exceedingly by their trailing radican branches, they should be cleared therefrom every year in winter.

Method of Propagation.

They are all easily propagated by seeds; several sorts also by suckers and their rooting branches; and all the sorts by layers.

By Seed.—Such sorts as do not furnish suckers, &c. may be easily raised from seed, procured from abroad, which should be sown soon after they arrive, either in large pots or in a bed or border of light earth, and covered half an inch deep; they will sometimes come up in May or June following, though if in pots and plunged in a hot-bed about six weeks, it will forward them; being careful to remove them to the full air soon after the plants appear; however, as those in the natural earth sometimes remain till the spring after, before they vegetate, keep the ground clear from weeds, give water in dry weather in summer, and if a severe winter, give occasional shelter of mats, the first year; and when the plants are one or two years old, plant them out in nursery rows, till large enough for the shrubbery.

By Suckers.—Several of the Sumachs send up abundance from the root; take them up any time in winter, and plant them in nursery-rows for a year or two.

By their radican Branches.—The two first *Toxicodendrons* multiply by their branches, which trail and root in the ground as they advance, which may be taken up in autumn, winter, or spring, with roots, and they will form proper plants.

By Layers.—Any of the sorts furnishing lower branches, may have the young wood layed by slit-laying in autumn, and many of them will be rooted in a year.

Most of the species of *Rhus* abound with a

milky juice, reckoned more or less poisonous, particularly the *Toxicodendrons*; as a slight touch of the leaves of these sorts cause violent itchings, sometimes followed by an inflammation and swelling; and if the juice of the wood or leaves is suffered to remain on the skin but for a few minutes, it occasions pustules like the itch: it is also said, the wood of the Poison tree, when burned, emits a very noxious fume, that will suffocate animals exposed thereto in a room.

Green-house Kinds.

Consists of three African Sumach shrubs, comprehending several varieties; retaining their leaves all the year by shelter of the green-house in winter, and effect an agreeable variety in that collection.

9. *Rhus tomentosa*.

Downy African Sumach.] Hath a shrubby stem, branching irregularly, six or eight feet high; ternate leaves, downy underneath, composed of angular, rhomboidal, sub-petiolated lobes, downy underneath, and slender bunches of whitish-green flowers from the sides of the branches.

Varieties.] Hairy-leaved—Serrated-leaved—Jagged-leaved—Oval-lobed.

10. *Rhus angustifolium*.

Narrow-leaved African Sumach.] Hath a shrubby stem, and irregular brown branches, growing from five or six, to ten or twelve feet high in the varieties; ternate leaves, having linear-lanceolate, entire, petiolated lobes, downy underneath; and small loose bunches of whitish-green flowers from the sides and ends of the branches.

Variety.] Silvery cut-leaved.

11. *Rhus lucidum*.

Shining-leaved African Sumach.] Hath a shrubby strong stem, and irregular brown branches, growing ten or twelve feet high; ternate leaves, having wedge-shaped, sessile, smooth, shining-green lobes; and small bunches of greenish flowers.

Varieties.] Round lobed—Heart-shaped-lobed—Dwarf growing.

These three green-house species must be always kept in pots, in order for moving to shelter in winter, managing them as other shrubby plants of the green-house collection. See GREEN-HOUSE PLANTS.

They are easily propagated by layers and cuttings.

By Layers.—In spring, lay any of the lower young wood in the common way, and they will be rooted and fit to pot off in autumn.

By Cuttings.—Plant cuttings of the young shoots in April, May, or June, in pots; and

if plunged in any hot-bed, they will soon strike, giving occasional shade and watering, and towards autumn pot them off separately.

Stove Kind.

12. *Rhus Cobbe*.

Ceylon Sumach.] Hath a shrubby stem, branching eight or ten feet high; ternate leaves, having oval, acuminate, sawed lobes, and clusters of whitish-green flowers at the ends of the branches, having downy peduncles.

It is a tender exotic, requiring a stove in this country, so must always be kept in pots, and placed in that department and managed as other shrubby hot-house plants.

Propagate it by cuttings in the spring, planted in pots, and plunge them in a bark-bed.

RIBES, Currant-tree and Gooseberry-bush.

The Currant and Gooseberry are hardy deciduous shrubs, species of the same genus, each comprising many varieties, all of bushy growth; garnished with trilobate simple leaves, and very small pentapetalous flowers from the sides of the branches; some in racemous clusters, others singly, succeeded by globular berries, valuable as early summer fruit, both some in their young green state, for several culinary purposes, and wholly in their mature growth of ripeness for the table dessert; continuing for use, in their different stages of growth, from May till September.

Class and order, *Pentandria Monogynia*.

Characters.] CALYX is monophyllous, ventricose, cut into five concave segments, and permanent. COROLLA, five small obtuse petals attached to the border of the calyx. STAMINA, five subulate filaments inserted in the calyx, having incumbent compressed antheræ. PISTILLUM, a roundish germen under the flower, bifid style, and obtuse stigmas. PERICARPIUM, a globose, umbilicated, unilocular berry, full of pulp, and many roundish compressed seeds.

The Currant and Gooseberry were long considered each as a separate genus; *Ribes* the Currant, and *Grossularia* the Gooseberry; but agreeable to systematic botany, they are now joined together, the *Grossularia* being made a species of *Ribes*; all the Currant kinds having inermous or thornless branches, and racemous clusters of flowers and fruit; and the Gooseberry have spinous branches, and flowers and fruit for the most part singly.

Currant Kinds.

There are three species of the Currant-tree, two of which and their varieties, merit culture for their fruit; the other as a plant of variety or observation; all of which are of

shrubby growth, generally dividing or branching out low into bushy heads; and all smooth or unarmed, having no thorns on the branches.

1. *RIBES rubrum*.

Common Red Currant-tree, &c.] Hath a shrubby stem, dividing low into many branches, forming a bushy head, five or six feet high, or more, without thorns; broad trilobate leaves, and small smooth pendulous clusters of plane greenish flowers, succeeded by clusters of small berries.

It grows naturally in woods and hedges in England, and most parts of Europe.

Varieties.] Comprises all the sorts of Red and White Currants, as common, small, Red Currant—Large Red Dutch Currant—Long bunched Red Currant—Champaigne Pale-red Currant—Common small White Currant—Large White Dutch Currant—Yellow blotched leaved Currant—Silver, striped-leaved—Gold striped leaved—Gooseberry-leaved.

All these sorts are varieties of one species, *Ribes rubrum*, or *Common Red Currant*, it being the parent from which all the others were first obtained from the seed, and improved by culture; they all flower in the spring, and the fruit ripens in June and July; and by having the trees in different situations and modes of training, such as plantations of standards in the open quarters, for the general supply, others trained against walls or pales, of different aspects, the fruit may be continued ripe in good perfection, from about the middle of June until October or November, provided the later crops are defended with mats or nets from the birds; the ripe fruit of all the varieties are valuable, not only to eat raw, as being of an agreeable, quick, acid relish, and fine cooling quality in the hot season, excellent to quench thirst and create an appetite; but the red sorts in particular are also made into jellies, tarts, sauces, and other culinary preparations. Likewise, of Currants is made good wine, and they are also used in medicine; so that plenty of the trees should be cultivated in every garden for the fruit, both for private use and in public gardens for the supply of markets: as to the variegated-leaved kinds, they are valued as furniture for the shrubbery, to cause diversity in the different variegations of their leaves; they also bear fruit plentifully like the other kinds; and all the varieties of every sort are very easy of propagation and culture, by cuttings, suckers, and layers. See their *Propagation*.

2. *RIBES nigrum*.

Black Currant-tree.] Hath a shrubby stem, dividing low into many branches, forming a bushy head, five or six feet high; with long

brownish coloured shoots; broad trilobate leaves and racemous clusters of oblong greenish flowers, succeeded by thin clusters of large, black, strong-flavoured berries.—The whole plant, on being handled, imparts a peculiarly rank odour.

The fruit of this species being of a strong flavour and somewhat physical relish, is not generally liked; it however is accounted very wholesome, and of which is also made a syrup of high estimation for sore throats and quinseys; hence the fruit is often called squinancy berries.

Variety.] *Pennsylvanian Black Currant.* Having smaller shoots and leaves; not strong scented; and small fruit of but little value; so the shrub is esteemed only for variety in shrubberies.

The mode of bearing of all the sorts of Currants, is both on the old and young wood, all along the sides of the branches and shoots, often upon a sort of small spurs and snags, producing the fruit in numerous long pendulous clusters.

Grossularia, or Gooseberry Kinds.

Of the *Grossularia* or Gooseberry kinds, there are four or five species, comprehending many varieties, all of which are of bushy growth, from about three or four, to six or seven feet high: some being upright, others of reclined growth; have all their branches armed with spines, and produce their fruit both on the young and old wood, all along the sides of the branches and shoots: sometimes immediately from the eyes or buds, of the young wood in particular, and also on small spurs on the older branches; in all of which the flowers and fruit arise, some singly, others in small bunches; all of the berry kind; useful both when green and ripe; green, for tarts, pies, sauces, and for preserving in bottles for winter use; and when ripe, it is valuable as an early dessert fruit; and the different sorts afford great variety at table, in their different colours and relishes.

3. *RIBES Grossularia*.

(Grossularia)—or Common Gooseberry-bush.] Rises with a low shrubby stem, dividing low into a very branchy bushy head, armed with spines; trilobate smallish leaves, having hairy ciliated foot-stalks, and small greenish flowers, succeeded by hairy berries.

Varieties.] Consists of many varieties of the fruit, of different sizes and colours, as hereafter described.

4. *RIBES reclinatum*.

Reclined broad-leaved Gooseberry-bush.] Rises with a low shrubby stem and reclined somewhat prickly branches; trilobate broadish

leaves, and small greenish flowers, having the pedunculi furnished with triphyllous bractæa.

5. *RIBES oxycanthoides*.

Hawthorn-like, or most prickly Gooseberry-bush.] Hath a shrubby stem, and branches armed on all sides with spines; and largish trilobate leaves.

6. *RIBES Uva crispa*.

Smooth-fruited Gooseberry.] Hath a shrubby stem and branches, armed with spines; trilobate leaves; pedicles having monophyllous bractæa; and smooth fruit.

7. *RIBES cynosbati*.

Prickly-fruited Gooseberry-bush.] Hath a shrubby stem and branches, armed with spines mostly at the axillas; and prickly fruit in clusters.

Varieties of the different species.] Many varieties of Gooseberries have of late years been raised from seeds; some of which are very large, and in the numerous varieties many are round berries, others oval; some hairy and some smooth, and of different colours, as Red—Green—Yellow—White, &c. consisting of the following varieties of each sort.

Red Kinds.—Small early Black-red Gooseberry—Hairy Red Gooseberry—Smooth Red Gooseberry—Deep Red Gooseberry—Damsion, or large Dark-red Gooseberry—Red Raspberry Gooseberry—Early large Black-red Gooseberry.

Green Kinds.—Early Green Gooseberry—Hairy Green Gooseberry—Smooth Green Gooseberry—Green Gascoigne Gooseberry—Green Raspberry Gooseberry.

Yellow Kinds.—Great oval Yellow Gooseberry—Great Amber Gooseberry—Hairy Amber Gooseberry—Early Amber Gooseberry.

White Kinds.—Large White Crystal Gooseberry—Common White Gooseberry—White-veined Gooseberry.

Other Varieties of different Sorts.] Champagne Gooseberry—Rombullion Gooseberry—Large Ironmonger Gooseberry—Smooth Ironmonger Gooseberry—Hairy Globe Gooseberry—Large Tawney, or Great Mogul Gooseberry.

Of each of the above classes of the varieties of Gooseberry, there are many others in the Grossularian catalogues, by name, differing only in the peculiar sizes and various tinges of the respective colours of the fruit, all originally obtained from seed; and in many of which now in culture the berries are remarkably large, particularly in some of those proceeding from what are called the Lancashire gooseberries, but many superior new varieties are now also raised from seed in many other places; and most of the nursery-men are

furnished with plants thereof in great variety: and the particular sorts may be propagated abundantly, and continued the same, by cuttings, suckers, and layers.

All the foregoing species of *Ribes*, both Currant and Gooseberry kinds, and all the different varieties, are very hardy shrubs, that prosper almost any where, both in open and shady situations, and in any common soil; bear plentifully in any exposure, though in open sunny situations, they produce superior fruit, ripening to a richer vinous flavour; but it is eligible to plant them in different situations and aspects, in order to have the fruit as early and late as possible.

They are commonly planted in the kitchen garden mostly as dwarf standards, in the open quarters, for the general supply; being disposed sometimes in continued plantations in rows, eight or ten feet by six asunder, where great quantities of the fruit are required for market or other large supplies; and are sometimes disposed in single ranges round near the outward edge of the quarters, six or eight feet asunder; frequently in single cross rows, in order to divide large quarters of ground into separate wide plats or breaks, of from twenty to thirty or forty feet width; which also serves to shelter the ground a little in winter; in all of which methods of planting them as standards, they should be generally trained up to a single stem about a foot high, then suffered to branch out every way all around into bushy heads, keeping the middle however open, and the branches moderately thin, to admit the sun and free air; though if some are fanned, that is, trimmed on two sides oppositely, so as to make the other branches range in a line like an espalier, whereby they will take up much less of the ground, and, by admitting the sun and air more freely, they will produce large fair fruit.

They are likewise trained against walls or palings, like other wall trees; but principally some of the large red and white Dutch Currants, in which they will produce fine large fruit, and those against any south fence will ripen early and be high flavoured; but it is proper to plant a few both against south, north, east, and west walls, in order to obtain the fruit ripening both early and late, in a long succession. It is also proper to plant a few of the finest sorts of Gooseberries against a warm fence, both to have early green Gooseberries for tarts, &c. as well as to ripen early; and they will grow very large and fine.

Sometimes both Currants and Gooseberries are also trained in low espaliers for variety, and they produce very fine fruit.

All the varieties of these shrubs are raised plentifully in the nurseries for sale.

Method of Propagation.

All the sorts of Currants and Gooseberries are expeditiously propagated by cuttings, suckers, and layers; but as every cutting and slip will most readily grow, that mode of propagating them is most commonly adopted in the nurseries, in raising great quantities for sale; also by seed to obtain new varieties, particularly Gooseberries.

By Cuttings.—Autumn, at the fall of the leaf, is the most eligible season for planting the cuttings; it may also be performed any time in winter, in open weather, and early part of the spring; choosing the young straight shoots, cutting them about ten or twelve to about fifteen inches long, prune the weak tops, and plant them in any shady border, or where most convenient, in rows a foot asunder, each full half way into the ground; they will root firmly the ensuing summer, shoot at top, and form tolerable little plants by next autumn, when every other row may be thinned out, and planted in nursery lines two feet and half asunder; afterwards train the whole for the purposes designed.

Observe, those designed for common standards should be trained up each with a twelve inch stem, then encourage them to branch out all around at that height to form a full head; for if suffered to branch away immediately from the bottom, or to run up in bottom suckers, according to the natural mode of growth of these kind of trees, as is often the case in many gardens, they overspread the ground, that no under-crops can grow prosperously near them, as well as appear unsightly, and render it inconvenient to do the necessary cultural work of the ground under their low-spreading branches: it is therefore of importance to keep them to a single stem, a foot at least high, then suffered to form the first set of branches, trimming off low stragglers, and encourage the more upright growths: thinning them to moderate distances, and reduce long ramblers to preserve a somewhat regular head; the trees will thus assume a decent appearance, admit of small crops under them, and will be more easily kept in regular order.

And if intended to train any of them with fanned branches, either for fanned standards, or for walls and espaliers, they must be encouraged to branch out near the bottom, with the branches ranged the way of the rows, cutting off all cross or foreright shoots, so as to form the side branches in a straight range, like an espalier, &c.

In all the above modes of training these

shrubs, by cuttings, they will attain a bearing state in two or three years.

By Suckers.—All the sorts send up suckers very plenteously from the roots, each sucker forming a proper plant, and is the most expeditious mode of propagating all the varieties, both Currants and Gooseberries; as the suckers being mostly furnished with roots, they at once form immediate rooted plants; they may be taken up in autumn, winter, or spring, with roots, or even such as are without fibres will succeed; for the lower part having been situated in the ground, near the root, acquires a rooty texture, is naturally disposed to send out fibres very soon; planting them either in nursery rows for a year or two, or such as are tall and strong may be planted at once where they are to remain: observing to train the whole for the purposes intended, as directed for the cuttings, and they will form bearing plants after one or two years growth.

But the propagating them by suckers, is by some objected to, as alleging they incline to run greatly to suckers again, and encumber the ground; there is, however, no very material peculiarity in this by suckers more than cuttings, &c. for it is peculiar to these shrubs, let them be raised either by seeds, cuttings, or any other method, to be naturally disposed to send up many suckers from the roots annually, though probably, those raised by cuttings taken from prime bearing trees, may sometimes sooner form full bearers. See SUCKERS.

Sometimes these shrubs having been permitted to advance with several stems, formed by suckers that have arisen directly from the root, the whole forming a large spreading bush, which, if taken up, may be divided into several separate plants, with good roots and branchy heads, and planted out finally to remain, they will at once commence immediate good bearing plants, producing fruit the following summer.

By Layers.—The young branches being layed any time in autumn, winter, or spring, will readily strike root, and next autumn be fit to transplant.

In the general propagation of these shrubs, we would observe, that, as they naturally throw out many suckers from the root, so as often to become troublesome, it is proper, previous to planting the cuttings and suckers, &c. to rub off close all the buds or prominent eyes, from the lower part, as far as they are to be put into the ground, which will in some measure diminish their tendency in the production of suckers: likewise, when transplanting the young plants, if they discover any tendency at

at the bottom for suckers, let all such parts be also carefully rubbed or cut off close.

By Seed.—This is practised occasionally to obtain new varieties of improved properties in the size and flavour of the fruit; but is more generally in practice for Gooseberries than currants, as the former are very prolific in many different varieties from seed, and by which numerous fine sorts have of late years been raised, the berries remarkably large and rich flavoured:—the seed of the ripe berries may be sown in autumn, in any bed or shady border of lightish earth, the plants will rise plentifully, permitting them to have one or two year's growth, then transplant them in nursery rows, to remain till they acquire a proper growth for bearing in some tolerable perfection; training them in the interval the same as those in the other methods of propagation; and, when become eligible bearers, those productive of superior fruit may be transplanted into the garden at the proper season, and the approved sorts thereof may be propagated for increase in the usual way, by cuttings and layers.

Final Transplantation.

When these shrubs, raised by the different methods as above, are grown about two or three feet high, in tolerable branchy heads, they are of a proper size for transplanting finally, into the garden where they are to remain for bearing.

They may be transplanted any time from October until March, in open weather.

Plant them in rows, eight or ten feet distance, both as standards and for walls, &c. observing to plant the principal quantity as standards for the general supply, and a few of the choicer sorts for walls, particularly of the Currants.

In planting them for standards, if a full or continued plantation of them is intended, set them in rows eight or ten feet asunder, as above observed, and six distant in the ranges; and if designed in single rows, either round or cross ways the quarters, allow full seven or eight feet distance in the row, for if closer, they will soon meet and prove troublesome.

And in planting them against walls or espaliers, allot principally a larger supply of red and white Currants, or most abundant of the red, especially where they are also required for culinary purposes, in tarts, pies, jellies, preserving, &c. as being more eligible for those occasions than the white Currants, which, however, is equally excellent as a dessert fruit, and by some preferred to the red sorts; but both the sorts merit admittance abundantly in the above order of training, in every garden,

where there is an eligible portion of walling or paling, &c. to spare for that purpose: and in which it is proper to dispose them in different aspects, some against south walls, or other similar close fences of the garden, for the production of early fruit, and others on west and easterly exposures, for successional ripening in a principal production, and a plentiful supply against northerly walls to continue a regular succession of ripe fruit late in the season: and for all of which, the plants should be trained, each with a very short stem, to branch out within a few inches of the ground, and planted six to eight or ten feet distance, arranging the branches more or less horizontally or upright, according as the allotted space of walling, &c. admits, three or four, to five or six inches asunder; and thus, being managed as hereafter directed, under the article, *Training them against walls, &c.* they will bear very abundantly in superior perfection, in size and goodness of the fruit.

A few prime sorts of gooseberries being planted also in the above order, principally on south walls for earliest fruit, and trained in the same manner, they will yield a desirable early production accordingly.

And where any gooseberries or currants are designed for training in the espalier order, plant and train them as those against walls, as above; and they will bear in similar perfection in a very agreeable variety.

General Culture, both in Standard Bushes, and against Walls and Espaliers.

1. *Their culture in common standard bushes in the open ground.*] In the general standard bushes arranged in the open quarters of the garden, both of gooseberries and currants, continue to train them, as before observed, each with a clean, single stem, about ten or twelve to fifteen inches, or a little more or less, as it may seem necessary on particular occasions, or according to the different growths of the plants; and then let the head branch out full and regularly, three or four feet high, and kept to some regular order, by occasional necessary pruning; either trained concave or hollow in the middle, or permitted to run up full in the centre, convexly, nearly in their natural order; but, in both cases, keep the general principal branches tolerably thin, at moderate distances, five or six inches at least asunder, at the extreme parts, whereby to admit the benefit of the free air and sun more effectually in summer; essentially necessary for improving the size and maturity of the fruit, and to ripen regularly in full perfection and proper flavour; retaining the same general branches several years,

or as long as they continue good bearers; and only according as any casually decline, they must be displaced, and young wood retained in their room; regulating the whole by proper pruning, never with garden shears, as sometimes done, but always with a knife in a regular manner, less or more, as they may require.

In the process of performing the necessary pruning in these standard bushes, the head of branches may either be kept moderately low, not exceeding three or four feet at most, and within proportionable compass; or permitted to advance more fully where they have good scope for their growth; in which, the shoots being suffered to run mostly at their full length, especially the gooseberries, except reducing long rambles, the head will aspire higher, and run more spreading, and, at last, will generally shoot in a more moderate degree, than such as are close pruned down annually to a particular height, &c. and the branches being kept thin with some regularity, will bear plentifully in good perfection; and this mode of growth is more particularly applicable to gooseberries, as above observed, which should be but very moderately shortened, or sometimes not at all in any general manner, as thereby they will not run so considerably to wood every summer, as when the shoots are much pruned down: but as currants generally run more extensively in a straighter upright growth, higher than gooseberries, if permitted to shoot, they require shortening more considerably in proportion, in order to continue them within some moderate compass; though if they are allowed to run in an aspiring growth, they will form large heads, four, five, or six feet high, and if the general branches are kept moderately thin, in some tolerable regularity, will bear fruit abundantly almost their whole length.

However, it may be proper to observe in general of these standard gooseberries and currants, that if the heads, by proper pruning, are kept moderately down to about three, or not exceeding four feet, and the branches continued in some regular order, at moderate distances from one to another, as formerly intimated, and hereafter directed, they will most probably produce larger fruit, ripening sooner, and with a better flavour; but remarking, in this case, that by the annual pruning to keep the shrubs low and regular, it causes them to throw out numerous shoots every summer, and crowd the head with useless wood, which must be regulated accordingly, by pruning them every winter, to retrench all that are evidently superfluous, and reserv-

others occasionally in proper places for young bearers, and to cut out irregular crowding branches occasionally.

But it should be also observed of these bushes in general, that as in every mode of growth, training, and pruning, they naturally send out numerous shoots annually in summer, from the sides and terminations of all the main branches and bearers, they require pruning accordingly, less or more every year, to retrench the superabundant and irregular growths, in order to preserve some degree of regularity, and open expansion in the branches, for the advantage of the fruit.

This general pruning is performed in winter, or any time from the fall of the leaf till February. With your knife retrench all superfluous shoots of last summer from the middle of the plants, and from the sides of most of the mother branches, except leaving a sufficiency where a supply of young wood appears necessary, and generally reserving a terminating shoot to every branch, and some occasional shoots in casual void spaces below, and other parts, either to be coming forward for young bearers, or to fill any present or apparently future vacancy; or in old trees, to supply the place of any worn out branches, or dead wood, which should always be retrenched, and some contiguous shoots retained; and clear the bottom from all suckers, &c.

At the same time observing, that when the branches in general become too numerous and crowding, or grow across, or in any very irregular growth, to cause confusion and disorder, they should also be regulated by pruning out the most irregular, leaving the others five or six inches asunder; likewise, retrench all low stragglers; and according as any of the branches become too long, or advanced higher than you intend, or any long Rambler happening, they should be reduced to order, by shortening them down to some convenient young shoot, or lower young branch terminated by one; for in reducing or shortening the branches, as occasion may require, they should not be stumped off to naked ends, but pruned down to a young shoot or branch, as just hinted, that they may still terminate in a young shoot if possible, for a leader.

The general supply of young shoots may be more or less shortened, according to their strength and situation, but more particularly the currants, if thought necessary to keep the head low and within moderate compass; cutting the upper shoots to six, eight, or ten inches; but the lower ones designed to grow up, to fill any vacancy, leave longer in proportion, or at full length, as it shall seem proper, till

arrived.

arrived to the desired height, conformable to the general branches of the head.

But the Gooseberry kinds having the young wood much shortened, it causes them to throw out very numerous lateral shoots in summer, and crowd the bushes exceedingly with unnecessary wood; it is therefore eligible to shorten the shoots of these kinds but moderately, or leave them mostly entire, or at full length; such, however, as recline considerably downward, or ramble away from all the rest, should be reduced with the knife, so as to preserve a little regularity in the head.

To conclude, be careful always, both in the Currant and Gooseberry kinds, not to suffer them to become of straggling growth, spreading near the ground, nor too much crowded at top; but annually clear off all suckers from the bottom, all lower straggling shoots from the stem, and keep the middle of the head open, and the branches in general thin about six or seven inches asunder, as aforesaid, preserving all the small lateral, bearing snags, natural spurs and fruit-buds; and thus these shrubs will always bear large and fair fruit in great abundance.

Their culture in fanned Standards.—If intended to fan any of them in standards, ranging the branches in the manner of espaliers, you must encourage only the branches that range the way of the rows, trimming off all fore and back shoots, and range the others about six inches asunder, at full length, till those of each tree nearly approach, which may be supported occasionally with stakes; giving occasional pruning both in summer to retrench all superfluous and projecting foreright shoots; and in winter to give a general regulation as observed for the common bush standards.

Training them against walls and espaliers.—

Let them branch out near the bottom, as formerly noticed in the nursery culture, clearing off all foreright growers, and train the others horizontally to the wall, &c. three or four to five or six inches asunder, at full length, till they have filled the allotted space; they will naturally form fruit-buds all along their sides, and bear abundantly. Observe to give them a summer and a winter pruning; in summer to retrench close all foreright, and evidently superfluous shoots, and train in only an occasional supply of some of the most regular shoots towards the lower parts, or where it may seem necessary, to remain till winter, in case of a vacancy, or to be in training for young bearers; and if then not wanted, must be displaced; and by this regulation in summer, it not only preserves the uniformity of the trees, but ex-

hibits the fruit to view, and gives access to a due portion of sun and air to improve its growth and flavour. And in winter pruning, see if there are any vacancies, and retain some contiguous shoot left in summer, cutting out any worn out or naked branch, down to some lower shoot or young branch, as observed of the standard bushes; looking occasionally to the lower part of the trees for any well-placed strong shoots, and see if they are wanted either to fill a present vacancy, or for training in to serve future purposes to supply the place of any old branch becoming naked, or unfurnished with bearing parts; in which cases, retain occasional supplies of young wood as you shall see necessary, keep all the main branches at regular distances, preserving all the spurs and fruit-buds, but cut off any long projecting snags, and all dead wood. Then train the whole straight and close to the wall at the distances aforesaid.

These trees, thus properly trained against walls, will grow eight or ten feet high, and extend widely every way.

Of the Fruit.

Young green fruit will be of proper size to gather for tarts, &c. in May, and early part of June; though gooseberries of the early kinds are sometimes advanced in small growth for the above occasions, in April, and more especially in trees trained on a south wall, to gather in small portions, as an early rarity, in some desirable kitchen uses, for which they are adapted.

However, the general production in the standard bushes in the open ground, will advance fast to a more eligible size of growth in May and June, to gather in some considerable portions for the several culinary purposes; though it is not advisable to make very considerable gatherings while the berries are yet in a small, green state of growth, as it would thin the trees considerably in making any great bulk in the quantity together, of small fruit thus gathered; unless the bushes are abundant to admit of gathering only some of the largest berries from many different bushes accordingly; but as they increase in size in the more advanced part of May, and till nearly of full growth in the middle or latter end of June, the gatherings may be more abundant in proportion; which, in the principal sorts, should generally be effected in the thinning order, particularly in those trees on which it is intended to retain a sufficient crop to acquire full growth for ripening.

But for the above occasion, in the young green fruit, it is principally gooseberries that are proper, both for immediate use, in the different

ent culinary purposes; and for bottling to keep for similar future occasions; observing, that for the latter purpose, the berries should be of some tolerable advanced size; and of which growth they are also very proper for most kitchen uses, to which they are applicable.

Though currants of the red sorts are also occasionally gathered while in their green state for tarts, where in particular request to make a variety at table; but they are not very eligible for that purpose, till they are nearly in full growth, and beginning to redden; and are in the greatest perfection for all their applicable purposes when fully grown, and perfectly ripe, both for the table, and for tarts, pies, preserving, &c.

Gooseberries, however, are always best for culinary uses, while in a green, unripe state, proper both in small, middling, and advanced growths, or even till nearly full grown, and beginning to change for ripening: but should attain full maturity of ripeness for table fruit, and for making gooseberry wine, &c.

The fruit of all the varieties, both Currants and Gooseberries, on standards and against walls, begin to ripen in June, but do not attain full perfection till July; those against warm walls ripen soonest by a fortnight, if the trees are properly dressed in summer, and will be succeeded by the standards for the general crop.

When designed to continue a supply of these fruit as long in the season as possible, it is proper to net some of the fullest trees, when they begin to ripen, to defend the berries from the birds; especially currants; and mat others to shade them from the sun, in order to retard their ripening. And if, when full ripe, some are closely matted with large mats, particularly Currants, it will preserve the fruit in perfection on the trees till October or November.

Of forcing them for early Fruit.

Gooseberry and currant trees are occasionally forced for early fruiting, by means of artificial heat in fruit-forcing-houses, hot-walls, or forcing-frames, &c.

For this purpose, some young trees being planted in largish pots, one plant in each, and being advanced to a full state of growth for plentiful bearing, may be introduced in any of the above forcing departments as are in cultivation in that business by fire, or hot-bed heat, or both occasionally, in forwarding any principal fruit-trees, plants, or flowers, at the proper season, January, or February, &c. and in which the same culture, in regard to the degree of heat, and other requisites, necessary for the other trees, &c. therein, is suitable for

these which we are now intimating; giving occasional watering to the earth in the pots, and sometimes after the fruit is set, water lightly over the branches, of a warm sunny day; and they will thus produce ripe fruit in April or May.—See *Forcing-Frames—Forcing, &c.*

RICINUS, Palma Christi.

Consists of tall, herbaceous, tender annuals for the pleasure-ground, rising with strong erect stems from three or four to ten or twelve feet high, adorned with luxuriant, palmated, peltated leaves, on long foot-stalks, and long spikes of apetalous monœcious flowers, in July and August.

Class and order, *Monœcia Monadelphica.*

Characters.] CALYX, male and female flowers, apart in the same spike; the males having monophyllous, five-parted cups, and those of the females three-parted, and deciduous. COROLLA, no petals. STAMINA, numerous filiform filaments, variously connected in the monadelphous way, terminated by roundish didymous antheræ. PISTILLUM, an oval covered germen, three bifid, erect patent styles, crowned by simple stigmas. PERICARPIUM, a roundish trifurcated, trivalved, trilocular capsule, each cell having a single oval seed.

There are three species, one of which only is common to our gardens, comprehending several varieties, some growing eight or ten feet high, others not above half so much, esteemed as ornamental plants for the singularity of their large, beautiful leaves, from one to two feet and half broad, deeply lobated into six or seven segments, expanded in the palmated way, and the foot-stalks, fixed in the middle underneath, in the peltated manner. See FOLIUM.

The species is

RICINUS Communis.

Common Palma Christi.] Rises with an upright, strong, herbaceous, jointed stem, eight or ten feet high; having sub-palmated, peltated, sawed leaves; and at the axillas, long spikes of whitish-green flowers, succeeded by ripe seeds in autumn.

Varieties.] There are many varieties, formerly supposed to be distinct species, but are found to be all varieties only of *Ricinus Communis*; and of which there are,—*Major Palma Christi*, growing from about six or eight to ten or twelve feet high.—*Minor Palma Christi*, growing but three or four feet high—green-stalked—grey-stalked—brown-stalked—red-stalked, &c.—broad-leaved, being more than two feet in breadth—lesser-leaved, being from ten or twelve to fifteen or eighteen

inches wide—deeply-divided-leaved—slightly-divided-leaved—grey-leaved—green-leaved—six-lobed-leaved—seven-lobed-leaved, &c. being all varieties of one species, which, and its varieties in general, are annual or biennial, natives of Africa, America, and the South of Europe, and require a hot-bed to raise them in this country.

They are fine majestic plants, annual, or at most biennial in England; but in their native soil, it is said, they are durable both in root and stem. In England, however, we consider them only as annuals, for being raised from seed in the spring, they shoot up to stem, flower, and perfect seeds the same year, and, if not sheltered, die root and all in the winter: but being sheltered in a green house or stove during that season, they will abide two years.

Their merit in our gardens is as ornamental plants, being raised first in a hot-bed, then transplanted into the borders in summer, they will effect a fine variety.

Their Propagation, &c.

They are raised from seed sown in any hot-bed with other tenderish annuals, such as Africans, China asters, &c. half an inch deep: when they are come up three inches high, pot some of them separately in small pots, which plunge also in a hot-bed; others prick in the earth of the bed, giving plenty of water, and according as they increase in size, shift those in pots into larger sizes; and about the end of May, or beginning of June, remove all of them into the full air, transplanting some with balls about their roots into the open borders, and retain some in pots to move occasionally where wanted: supplying the whole with water in dry weather, particularly the transplanted plants in the borders, &c. till firmly rooted, and the potted plants all the summer, about three times a week. Thus these fine plants will grow to their full height in August, well clothed with their noble foliage, and will produce flowers and seed.

If intended to preserve any in the greenhouse all the winter for variety, chuse some of the handsomest potted plants, which remove into that repository in October, where they will retain their stems and leaves.

RIDGING Ground—to lie fallow in winter, &c. to mellow, and improve its quality and fertility.

This is an essential cultural work, in the kitchen garden particularly, and occasionally in all the other districts, very beneficial to the ground in general, and is of singular utility in stiff, and heavy soils, and cold wet land; though soils of every degree acquire great improvement by that means; being effected

by trench-digging the ground, laying the earth of each trench in a raised, rough ridge, length-ways thereof, that by thus lying as open and hollow as possible, it may meliorate and fertilise more effectually by the weather.

The ridging of ground is of much utility in all soils, both when intended the ground to lie fallow some considerable time, and even when occasionally required for almost immediate sowing or planting, and being levelled down accordingly for that purpose, is an additional improvement in the more effectual melioration of the soil: for by trenching the ground in Ridges, it, in that order, has not only the greater advantage of receiving every possible benefit of improvement, from the action of the sun, air, and different effects of the weather; but also in general, the levelling it down, as just above observed, which is expeditiously effected, for the reception of the intended seeds, plants, roots, &c. both farther breaks, divides, and pulverises the earth more effectually, greatly beneficial, preparatory to every order of general culture, and additionally promotive of its fertility; that in the whole, the ground, from the above advantages, always considerably improves the growth of the respective vegetables.

So that in the trenching or digging ground, when intending it shall have the advantage of fallow for some time, it is always advisable to dig or trench it in Ridges; generally performed either in the latter end of autumn, or any time in winter, or early in the spring, both as the ground is the most vacant at those seasons, and not generally immediately wanted for any principal sowing or planting, and that it will have the best advantage of all possible improvement by the various changes of different weathers, in the interval to recruit and invigorate its vegetative powers, for the benefit of its future production the ensuing summer: essentially beneficial in all soils, and is particularly eligible in all stiff, and very moist, and cold heavy land.

The method of Ridging ground is effected by proceeding in the work of trenching, as before suggested, by digging it in regular trenches, one or two spades wide, or more generally the latter, and one full spade deep, and the crumbs, or loose earth at bottom, or sometimes two spades deep, or more, on some particular occasions, and according to the general depth of the good staple or fertile earth, not to dig deeper into the bad soil: so laying the earth of each trench ridge ways its whole length, proceeding in the following manner.

Beginning at one end of the compartment of ground intended for Ridging, dig out a trench, the

the above width and depth, length-ways across the ground, and wheel the earth thereof to the finishing end, ready to fill up the last trench: so marking out a second trench close to the first, of the same width, then proceed in the trenching and Ridging, previously paring the top of the second trench with all weeds, rubbish, or dung thereon, if any, into the bottom of the first, and then dig the ground of the second along regularly, the proper width and depth as above; turning the earth spit and spit into the first open trench, laying it in a raised ridge lengthways thereof, without breaking it fine, but rather to lie somewhat rough and hollow, according as the nature of the soil admits, that the whole may thereby have a greater equal benefit of the free air, sun, rains, frost, &c. to meliorate and improve its quality as much as possible for the advantage of its future produce: so thus proceeding with another trench in the same manner, continue the same with the whole, trench and trench, to the end of the plat of ground; filling up the last trench with the earth of the first opened, aforesaid, having been carried thence, and laid convenient for this purpose, laying it now ridge-ways as in the preceding trenches.

Thus the ground remaining in Ridges, one, two, or several months, till wanted for sowing or planting, receives the advantage of fallow more essentially than if digged or trenched level; and is soon levelled down for seeds, plants, &c. according as wanted; in which, by the fresh stirring or moving the ground, proves an additional improvement, as before observed, by farther dividing and loosening the earth.

Observe, that in the work of levelling down the Ridged ground, as occasionally wanted, should proceed regularly, ridge and ridge, long-ways, levelling the earth equally to the right and left, loosening any solid parts, and breaking now all large rough lumps and clods moderately fine; forming the whole in an even regular surface, in order for sowing and planting as required.

Generally in levelling down Ridged ground for sowing of seeds particularly, it is not advisable to lay down more than can be sown the same or next day, while the surface is fresh stirred, especially in broad-cast sowing and raking in the seed, as most generally all tolerably light mellow soils are more yielding to the rake while the surface is fresh moved; or before either rendered wet by rain, &c. or very dry and hardened in the top earth by the sun, air, and winds, in dry weather, in the spring months, &c. and likewise, for sowing seeds by bedding in and covering in with earth

from the alleys, &c. or with earth raked off the beds for that purpose, it would generally be most successful to perform it in a fresh stirred surface; though not so material in drill sowing: and besides, when seeds are committed to the earth while it is in a fresh turned up surface, especially in a dry season, is more promotive in forwarding a free regular germination sooner than in ground that has lain some time after digging or levelling down, as above; though some grounds of a wet, or heavy, stiff temperament, sometimes require to lie a few days after digging or levelling down, in order for the rough cloddy surface to mellow in some degree, either by drying a little, or by having a moderate rain, or sometimes both, to meliorate the lumpy clods, pliant to the rake, in the case of broad-cast sowing and raking in the seed, as above observed.

However, in ground prepared by digging or levelling down, designed for sowing seed in drills, or for any kind of planting, it is not always so material in observing very particularly the above intimations, after the preparation of laying it down, though it is generally most effectually successful in all cases to sow or plant while the prepared ground remains in some tolerably fresh state.

RIVINIA, *Rivinia*.

Two shrubby evergreens for the stove compose this genus: one a low upright plant, the other a high climber; furnished with heart-shaped and oval leaves, and spikes of small apetalous flowers.

Class and order, *Tetrandria Monogynia*.

Characters.] CALYX, four oblong-oval, coloured, permanent leaves. COROLLA, no petals. STAMINA, four, and some eight permanent filaments, having small antheræ. PISTILLUM, a large roundish germen, short style, and obtuse stigma. PERICARPIUM, a globular unilocular berry lodged close in the calyx, having one roundish seed.

The species are,

1. RIVINIA *humilis*.

Dwarf Tetrandrous Jamaica Rivinia.] Hath a low shrubby stem, dividing and branching three or four feet high; heart-shaped leaves, and long spikes of small tetrandrous flowers, succeeded by red berries.

Varieties.] Downy white-leaved—white-flowered—scarlet-flowered.

2. RIVINIA *octandra*.

Climbing Octandrous American Rivinia.] Rises with a shrubby, climbing, branchy stem, fifteen or eighteen feet high. Oval-spear-shaped leaves, and loose spikes of small octandrous flowers, succeeded by blue berries.

Both the species are evergreen, and being tender exotics from the warmest parts of America, must be kept always in pots and placed among the stove plants, where they will flower most times of the year: the flowers are apetalous, separately small, but numerous in each spike, arising in great abundance from the sides and ends of the branches, succeeded by berries.

They are raised from seed sown in pots, and plunged in a bark-bed. Try them also by layers and cuttings, assisted by heat.

ROBINIA, False Acacia.

Consists of hardy deciduous trees and shrubs for ornamental plantations, and tender kinds for the hot-house collection; adorned with pinnated and quaternate leaves; and pendulous clusters of papilionaceous flowers.

Class and order, *Diadelphia Decandria*.

Characters.] CALYX is monophyllous, and four-parted, having the three under segments narrow, the other broad. COROLLA is papilionaceous, having a large, round, patent vexillum, two oval wings, with short appendices, and a nearly semi-orbicular depressed carina. STAMINA, ten diadelphous filaments, and roundish antheræ. PISTILLUM, a cylindric oblong germen, slender bent style, and hairy stigma. PERICARPIUM, a large, oblong, compressed pod, having kidney-shaped seeds.

There are about seven species retained in our gardens; all of the tree and shrub kind; five of them hardy for the shrubbery, and two tender for the stove.

Hardy Kinds.

These consist of two large tree kinds, and three or four moderate and small shrubs, all deciduous, natives of foreign parts, America, Siberia, and Tartary, but all hardy enough to succeed in our open plantations.

1. ROBINIA *Pseud-Acacia*.

(*Pseudo-Acacia*) False Acacia, or American Robinia.] Rises with a strong, woody trunk, dividing and branching thirty or forty feet high; armed with strong spines; large, long, pinnated leaves of nine or ten pair of oval lobes, and an odd one, having prickly stipulæ, and long pendulous racemous clusters of papilionaceous, white, odoriferous flowers, one on each pedicle, succeeded by smooth seed-pods.

Variety.] Echinated, or Prickly-podded American False Acacia.

Grows thirty or forty feet high, having leaves and flowers like the others, but with short very prickly pods.

2. ROBINIA *hispida*.

Hispid American Robinia, commonly called *Rose Acacia*.] Grows fifteen or twenty feet

high, but appears like a moderate shrub in England, armed with spines, and hispid hairs on every part, having leaves and flowers formed like the other: but the flowers are of a beautiful rose-colour, making a fine appearance.

This is a very beautiful flowering shrub, for the principal compartments of the shrubbery.

3. ROBINIA *Caragana*.

Siberian Abrupt-leaved Robinia.] Rises with a shrubby stem, branching eight or ten feet high, or more: abruptly pinnated leaves of five or six pair of oval lobes, not terminated by an odd one, and simple or unbranched pedunculi, sustaining small yellow flowers.

4. ROBINIA *frutescens*.

Shrubby Quaternate-leaved Siberian Robinia.] Hath a shrubby stem, branching six or eight feet high, quaternate oval leaves, on short foot-stalks, and simple pedunculi, sustaining yellow flowers.

5. ROBINIA *pigmæa*.

Dwarf Quaternate-leaved Siberian Robinia.] Hath a low shrubby stem, branching about three feet high. Quaternate, wedge-shaped, close-fitting leaves; and simple pedunculi, sustaining yellow flowers.

The above five hardy species flower here annually, the first sort in June and the others in May. The flowers are all papilionaceous and tetrapetalous; arising from the sides and ends of the branches; which in the first two sorts and varieties being produced in long clusters, make a fine appearance, particularly the *Rose Acacia*; and most of the sorts are succeeded by seed-pods, ripening in September, particularly the last three species.

They are all proper furniture for embellishing the shrubberies, will succeed any where, and exhibit a fine variety with their pinnated and quaternate leaves, and the *Pseud-Acacia*, and varieties, also with the numerous clusters of flowers, but are most ornamentally beautiful in the *Robinia hispida*, or *Rose Acacia*.

Hot-house Kinds.

Consists of two tree and shrub species, natives of the warm parts of America and India.

6. ROBINIA *violacea*.

Violet American Robinia.] Hath a woody trunk, branching twenty feet high; pinnated leaves of eight or ten pair of oval lobes, and an odd one; and clusters of violet-coloured flowers, two on each pedicle.

Varieties.] With dark-blue-flowers—scarlet-flowered—and with leaves having spear-shaped lobes—oblong lobes, &c.

7. ROBINIA *mitis*.

Smooth

Smooth Indian Robinia.] Hath a smooth shrubby stem and branches; pinnated leaves, of several pair of oval lobes, and an odd one; and clusters of whitish flowers, three on each pedicle.

All the hardy species being for the shrubbery, may be had at the nurseries, particularly the first two species and varieties, and the *Caragana*, &c. and may all be planted in any common soil and situation.

But the two tender species must always be kept in pots, and placed in the stove.

Method of Propagation.

The hardy kinds are raised from seeds, cuttings, layers, and suckers.

By Seeds.—In March, sow them in any bed of light mould, half an inch deep: the plants will come up in less than two months, the first species and varieties in particular, the others sometimes not till spring after, unless sown in autumn: give occasional weeding and watering, and in the spring following plant them out in nursery-rows, to have two or three years' growth.

By Cuttings.—In October or November, having a quantity of cuttings of the young shoots, plant them in a shady border, and they will be rooted well in one year.

By Layers.—Lay the young wood in autumn, they will be rooted by autumn following.

By Suckers.—The first two species generally send up plenty from the root, which transplant any time from October till March.

The tender sorts are raised from seed, cuttings, and layers, assisted by artificial heat.

RONDELETIA.

This genus furnishes the stove with two woody exotics, garnished with oblong-oval leaves, and paniculated flowers.

Class and order, *Pentandria Monogynia*.

Characters.] CALYX, a monophyllous, top-shaped cup, sitting on the germen, with the brim cut into five acute parts. COROLLA, monopetalous and funnel-shaped, the tube is cylindric and bellied at the top, with the border reflexed, roundish, and cut into five parts. STAMINA, five awl-shaped filaments, topped with simple antheræ. PISTILLUM, a roundish germen under the flower, slender style, crowned with a bifid stigma. PERICARPIUM, a roundish, coronated, bilocular capsule, containing many seeds.

The species are,

1. *RONDELETIA americana.*

American Rondeletia.] Rises with a woody stem, eight or ten feet high, with branches covered with a smooth greenish bark, and gar-

nished with oblong, sessile leaves, sitting close to the branches; the flowers are white, and come out on a dichotomous panicle.

2. *RONDELETIA hirta.*

Hairy Rondeletia.] Rises with a woody stem, six or seven feet high, dividing into several branches garnished with oval-oblong, pointed, hairy leaves, standing on footstalks; the flowers are yellowish, and come out on a trichotomous panicle, and are of a fragrant odour.

These plants being natives of the West Indies, must be constantly kept in the stove; their propagation is by seeds which should be sown early on a hot-bed in the spring, and when the plants are come up three or four inches high, must be transplanted into single pots, and plunged in the bark-pit, and afterward treated as other plants of the like nature.

ROSA, Rose-Tree.

This noted genus comprehends numerous deciduous flowering shrubs, and an evergreen; all of hardy growth, and the pride of the shrubby flowering tribe, for adorning the pleasure-grounds, &c. with their large elegant flowers, in great profusion, for several months in summer; are garnished with pinnated rough leaves, of from three to five or seven lobes; and numerous large, pentapetalous, very odoriferous flowers, comprising many double varieties of singular beauty.

Class and order, *Icosandria Polygynia*.

Characters.] CALYX is monophyllous, ventricose, and fleshy below, and divided at top into five long, narrow, spear-shaped segments, two of which alternately having appendices on their sides, two alternately naked, and the fifth sometimes appendiculated on one side only. COROLLA, five obversely heart-shaped petals, inserted into the calyx. STAMINA, numerous short capillary filaments, inserted into the neck of the calyx, and trigonous antheræ. PISTILLUM, numerous germina in the bottom of the calyx, and numerous very short hairy styles, straitly compressed in the neck of the calyx, and inserted into the sides of the germen, crowned by obtuse stigmas. PERICARPIUM, the fleshy base of the calyx becomes a turbinated, fleshy, soft, unilocular berry, having numerous oblong hairy seeds, fastened on each side to the calyx.

The sorts of Roses are very numerous, and the botanists find it very difficult to determine with accuracy, which are species, and which varieties, as well as which are varieties of the respective species; on which account Linnæus, and some other eminent authors, are inclined

to think that there is only one real species of Rose, which is the *Rosa canina*, or Dog-Rose of the hedges, &c. and that all the other sorts are accidental varieties of it; however, according to the present arrangement, they stand divided into eighteen supposed species, each described to have some particular mark of distinction, though in several sorts is not very conspicuous; and agreeable to the specific description of the several species, each comprehends some varieties, which in some sorts are but few, others numerous.

The supposed species and their varieties are as follow :

1. *ROSA canina*.

Canine Rose, or Wild Dog-Rose of the Hedges, or Hep-tree.] Grows five or six feet high, having prickly stalks and branches, pinnated, five or seven lobed leaves, with aculeated footstalks; smooth pedunculi; oval, smooth germina, and small single flowers.

Varieties.] Red-flowered Canine Rose—white-flowered.

They grow wild in hedges abundantly all over the kingdom, and are sometimes admitted into gardens, a few to increase the variety of the shrubbery collection.

2. *ROSA alba*.

Common White Rose.] Grows five or six feet high, having a green stem and branches, armed with prickles; hispid pedunculi; oval, smooth germina, and large white flowers.

Varieties.] Large double White Rose—semi-double White Rose—dwarf single White Rose—maiden's-blush White Rose, being large, produced in clusters, and of a white and blush-red colour.

3. *ROSA gallica*.

Gallican, or Common Red Rose.] Grows from about three or four to eight or ten feet high, in different varieties, pinnated three, five, or seven lobed leaves, and large, semi-double, red, and other coloured flowers, in the different varieties of the plants relatives of the same species.

The specific description is,—Rose, with hispid, prickly branches, and petioles; hispid pedunculi, and oval hispid germina.

Varieties.] This species comprises three or four principal varieties of Roses, supposed originally a progeny thereof, as bearing nearly the above specific distinction; consisting of the following sorts.

Common Red Officinal Rose.] Grows erect, about three or four feet high, having small branches, with but few prickles; and large, spreading, half-double, deep-red flowers.

The flowers being astringent, are used in

medicine, being gathered for that use while in the bud, or before they begin to open; and they fetch a good price at market, where they are sold by the peck, or bushel, and pay sufficiently for the culture of a large quantity of plants; for which purpose the London gardeners plant them in close ranges, forming low hedges, a foot or two high, keeping them down by an annual clipping in autumn; and they produce great quantities of flowers.

Marbled Rose.] Grows four or five feet high, having brownish branches with but few prickles, and large double finely-marbled red flowers.

Double Virgin Rose.] Grows five or six feet high, having greenish branches, with scarce any spines, and large pale-red flowers.

Rosa Mundi, (Rose of the World) or striped Red Rose.] Is a variety of the common Red Rose, growing but three or four feet high; having large spreading semi-double red flowers, beautifully striped with white—and deep-red.

4. *ROSA damascena*.

Damask Red Rose.] Grows five or six to eight or ten feet high, having greenish branches, armed with short aculei, and garnished with oval-lobed leaves, and moderately double, fine red, very fragrant flowers.

The specific description is,—Rose with prickly branches and petioles; pinnated leaves, with oval, pointed, villous leaves, hispid peduncles, semi-pinnate cups, and oval, turgid, hispid germina.

Varieties.] This species is comprehensive in several very noted supposed varieties thereof, viz.

White Damask Rose.] Grows eight or ten feet high, with very prickly branches, oval leaves, and whitish blush flowers, becoming gradually of a pure white colour.

Blush Damask Rose.] Grows eight or ten feet high, with greenish branches, armed with short prickles; oval leaves, and faint-red flowers.

York and Lancaster variegated Rose.] Grows five, six, or eight feet high, or more; bearing variegated red flowers; consisting of a mixture of red and white; also frequently disposed in elegant stripes, sometimes in half of the flower, and sometimes in some of the petals.

Monthly Rose.] Grows about four or five feet high, with green, very prickly shoots; producing middle-sized, moderately-double, delicate flowers, of different colours in the varieties.

Varieties are,] Common red-flowered Monthly Rose—blush-flowered—white-flowered

ered—striped-flowered.—All of which blow both early and late, and often produce flowers several months in the year, as May, June, and July; and frequently again in August, or September; and sometimes, in fine mild seasons, continues till November or December: hence the name Monthly Rose.

It is generally the earliest blowing Rose; but as it begins to shoot early in the spring, the buds are often cut by the frost, so as to prevent their blowing fair and plenteously: the plants should therefore have a somewhat sheltered warm situation; some should also be planted against a warm wall; and is a proper sort to pot for forcing.

Blush Belgic Rose.] Grows three or four feet high, or more; having greenish prickly branches, five or seven-lobed leaves, and numerous, very double, bluish-red flowers, with short petals, evenly arranged.

Red Belgic Rose.] Having greenish and red shoots and leaves, and fine double deep-red flowers.

Velvet Rose.] Grows three or four feet high, armed with but few prickles, producing large velvet red flowers, comprising semi-double and double varieties, all of them very beautiful Roses.

5. *ROSA lutea.*

Yellow Austrian Rose.] Grows five or six feet high, having reddish very prickly shoots; and numerous small, bright-yellow flowers.

The specific description is,—Rose with branches armed with straight prickles, spinulous cup and petioles, with smooth pedunculi, and globose smooth germina.

Double Yellow Rose.] Grows six or seven feet high; brownish branches, armed with numerous large and small yellowish prickles; and large very double yellow flowers.

Red and Yellow Austrian Rose.] Grows five or six feet high, having slender, reddish branches, armed with short, brownish aculei; and with flowers of a reddish copper colour on one side, the other side yellow.

This is a curious variety, and the flowers assume a singularly agreeable appearance.

6. *ROSA turbinata.*

Turbinated, or Frankfort Rose.] Grows eight or ten feet high, is a vigorous shooter, with brownish branches, thinly armed with strong prickles; and produces largish, double, purplish-red flowers, that blow irregularly, and have but little fragrance.

The specific description is,—Rose with sparsely, recurved prickles, villous petioles, pilous peduncles, and top-shaped pilous germina.

7. *ROSA centifolia.*

Hundred-leaved Red Rose, &c.] Grows from about three or four to six or eight feet high, in different sorts, all of them hispid and prickly; pinnated three and five-lobed leaves, and large very double red flowers, having very numerous petals, and of different shades of colours in the varieties.

Specific description is,—Rose with hispid and prickly stalks and branches, inermous or unarmed petioles; hispid pedunculi, and oval hispid germina.

Varities are,

Common Dutch hundred-leaved Rose.] Grows three or four feet high, with erect greenish branches, but moderately armed with prickles; and large, remarkably double red flower, with short regularly arranged petals.

Blush hundred-leaved Rose.] Grows like the other, with large, very double, pale-red flowers.

Velvet Rose.] Grows three or four feet high, armed with but few prickles, producing large velvet red flowers, comprising semi-double and double roses.

8. *ROSA provincialis.*

Provence Rose.] Grows five or six feet, with greenish-brown, prickly branches, and very large double globular red flowers, with large petals folding over one another, more or less in the varieties.

Specific description is,—Rose with branches armed with sparsely sub-reflexed prickles, hispid petioles and peduncles, roundish hispid germina, and oval folioles, villous underneath.

Varities are,] Common Red Provence Rose, —White Provence Rose—and Pale Provence Rose; each of which having larger, and somewhat looser petals than the following sort.—Cabbage Provence Rose; having the petals closely folded over one another like cabbages —Dutch Cabbage Rose, very large, and cabbages tolerably—Childing Provence Rose—Rose of Meaux or Dwarf Rose—Great Royal Rose, grows six or eight feet high, producing remarkably large, somewhat loose, but very elegant flowers.—All these are large double red flowers, somewhat globular at first blowing, becoming gradually a little spreading at top, and are all very ornamental fragrant Roses.

9. *ROSA muscosa.*

Moss Provence Rose.] Grows erectly, four or five feet high, having brownish stalks and branches, very closely armed with short prickles, and double, crimson-red flowers; having the calyx and upper part of the peduncle surrounded with a rough mossy-like substance, effecting a curious singularity.

This

This is a fine delicate Rose, of a high fragrance, which, together with its mossy calyx and peduncles, renders it of great estimation as a curiosity.

10. *Rosa cinnamomea*.

Cinnamon Rose.] Grows five or six feet high, or more, with purplish branches, thinly aculeated; pinnated five or seven-lobed leaves, having almost inermous petioles; smooth pedunculi, and smooth globular germina; and small purplish-red cinnamon-scented flowers, early in May.

Varieties.] With double flowers—single-flowered.

11. *Rosa alpina*.

Alpine inermous Rose.] Grows five or six feet high, having smooth, or unarmed, reddish branches; pinnated, seven-lobed, smooth leaves, somewhat hispid pedunculi, oval germina, and deep-red single flowers; appearing in May.

This species, as being inermous, or free from all kind of armature common to the other sorts of Roses, is esteemed as a singularity; and from its inermous property, is often called the Virgin Rose.

12. *Rosa carolina*.

Carolina and Virginia Rose, &c.] Grows six or eight feet high, or more; having smooth, reddish branches, very thinly aculeated; pinnated, seven-lobed, smooth leaves, with prickly foot-stalks; somewhat hispid pedunculi, globose hispid germen, and single red flowers, in clusters, appearing mostly in August and September.

Varieties.] Spreading Carolina Rose—Upright Carolina Rose—Dwarf Pennsylvanian Rose, with single and double red-flowers—American pale-red Rose—Great Burnet-leaved, single-flowered—Great Burnet-leaved, double-flowered.

This species and varieties grow naturally in different parts of North America; they effect a fine variety in our gardens, and are in estimation for their serotinous, or late-flowering property, as they often continue in blow from August until October; and the flowers are succeeded by numerous, red, berry-like heps in autumn, causing a variety all winter.

13. *Rosa villosa*.

Villous, or Apple-bearing Rose.] Grows six or eight feet high, having strong, erect, brownish, smooth branches, aculeated sparsely; pinnated, seven-lobed, villose, or hairy-leaves, downy underneath; with prickly foot-stalks, hispid peduncles, globular, prickly germen; and large single red flowers, succeeded by large, round, prickly heps, as big as little apples. *Variety*, with double flowers.

This species merits admittance in every collection as a curiosity for the singularity of its fruit, both for variety and use; for it having a thick pulp of an agreeable acid relish, is often made into a tolerable good sweet-meat.

14. *Rosa pimpinellifolia*.

Small Burnet-leaved Rose.] Grows about a yard high, aculeated sparsely; small, neatly pinnated, seven-lobed leaves, having obtuse folioles, and rough petioles; smooth peduncles; globular, smooth germen; and small single flowers.

Varieties.] With red flowers—and with white flowers.

They grow wild in England, &c. and are cultivated in shrubberies for variety.

15. *Rosa spinosissima*.

Most Spinous, or Dwarf Scotch Rose.] Grows but two or three feet high, very closely armed with spines; small, neatly pinnated, seven-lobed leaves, with prickly foot-stalks; prickly pedunculi; oval, smooth germina; and numerous, small, single flowers, succeeded by round, dark-purple heps.

Varieties.] Common white-flowered—red-flowered—striped-flowered—marbled-flowered—yellow-flowered.

They grow naturally in England, and Scotland, &c. the first variety rises near a yard high, the others but one or two feet; all of which are single-flowered; but the flowers being numerous all over the branches, make a pretty appearance in a collection.

16. *Rosa eglanteria*.

Eglantine Rose, or Sweet Briar.] Grows five or six feet high, having green branches, armed with strong spines sparsely; pinnated, seven-lobed, odoriferous leaves, with acute folioles, and rough foot-stalks; smooth pedunculi; globular smooth germina, and small pale-red flowers.

Varieties.] Common single-flowered—semi-double-flowered—double-flowered—blush double-flowered—evergreen double-flowered—yellow-flowered.

This species grows naturally in some parts of England, and in Switzerland.

It claims culture in every garden for the odoriferous property of its leaves; and should be planted in the borders, and other compartments contiguous to walks, or near the habitation, where the plants will impart their refreshing fragrance very profusely all around; and the young branches are excellent for improving the odour of nose-gays and bow-pots; and for which purpose the London gardeners raise great quantities for sale, of the common single kind, which they effect by seed, sowing it in autumn, or spring, in drills an inch deep; and

and the plants may either remain, or be transplanted where required. See the *Propagation*.

But the double-flowered kinds, and yellow variety are continued the same, only by suckers and layers.

17. *Rosa moschata*.

Musk-Rose.] Hath weak, smooth, green stalks and branches, rising by support, from six to eight or ten feet high, or more, thinly armed with strong spines; pinnated, seven-lobed, smooth leaves, the lobes oblong, and pointed; with prickly foot-stalks; hispid peduncles; oval hispid germina; and all the branches terminated by large paniculate clusters, of pure-white, musk-scented flowers in August, &c.

Varieties.] With single flowers—and with double flowers.

18. *Rosa sempervirens*.

Ever-green Musk Rose.] Hath somewhat trailing stalks and branches, rising by support five or six feet high, or more, having a smooth bark, armed with prickles; pinnated, five-lobed, smooth, shining, ever-green leaves, with prickly petioles; hispid pedunculi; oval hispid germen; and all the branches terminated by clusters of pure-white flowers of a musky fragrance; appearing the end of July, and in August.

The sempervirent property of this elegant species renders it a curiosity among the Rosy tribe; it also makes a fine appearance as a flowering shrub.

The two last species and varieties flower in August; and are remarkable for producing them numerously in clusters, continuing in succession till October or November. They should generally be allowed support of stakes, or some planted against a wall, &c.

All the above species of *Rosa*, and their respective varieties, are of the shrub kind; all deciduous, except the last sort, and of hardy growth, succeed in any common soil and situation, and flower annually in great abundance from May till October, in different sorts; though the general flowering season for the principal part of them is June and July; but in a full collection of the different species, the blow is continued in constant succession several months, even sometimes from May till near Christmas; producing their flowers universally on the same year's shoots, rising from those of the year before, generally on long pedunculi, each terminated by one or more Roses, which, in their characteristic state, consists each of five large petals, and many stamina; but in the doubles, the petals are very numerous; and in some sorts, the flowers

are succeeded by fruit ripening to a red colour in autumn and winter; from the seed of which the plants may be raised; but the most certain and eligible mode of propagating most of the sorts is by suckers and layers; and by which methods they may be increased very expeditiously in great abundance.—See their *Propagation*.

All these shrubs are fine ornamental furniture for every garden, in the exceeding beauty and fragrance of their elegant flowers; and as they will all grow any where without much trouble of culture, only a little occasional pruning, and may be obtained at all the nurseries, at moderate rates, every garden may be easily furnished with a full collection; and being possessed of a few of each sort, they will most of them soon increase the stock considerably by suckers.

The season for planting all the sorts is any time in open weather from October till March, and they will all flower in perfection the following summer; but if occasion requires, they may be transplanted so late as any time in April, or even the beginning of May, which late planting is sometimes designedly practised to a few occasionally, to obtain a late bloom in autumn; however, the earlier the planting is performed, the stronger the plants will flower.

When these shrubs are designed for the shrubbery, and common flower borders, they should be planted singly; and may be trained with a single stem, one, two, or more feet high, and then encouraged to branch out into a bushy head; though when they are required to exhibit a more bushy growth, they are often suffered to branch away immediately from the bottom; as they will blow plentifully in any mode of training; however, I should advise keeping them to a short, single stem below, and let them form a bushy head upward two, three, or four, to five or six feet high, according to their respective growths; or some sorts being permitted to run, and have support, will grow much higher; I having, for curiosity, run some with a single stem, from five or six to nine, or ten feet, supported erect, with a tall stake, or small pole, and at that height they formed a small branchy head, and produced plenty of Roses; but for general growth, a moderately-low, full, branchy head, of the former-mentioned heights, is the most eligible; and some may be run up more or less to effect greater variety, or some large-growing sorts being planted against a wall, &c. they may be trained to several feet extent both horizontally and upright. All of which, in their different growths, in regard to culture, is not very material; especially in the common

standard bushes; consisting chiefly in clearing the bottom from suckers, in winter, which will serve for new plants, and thin the head occasionally, when grown too thick and confused, and reduce any long rambling shoot, and cut out dead wood; but as these shrubs produce their flowers generally on the young shoots, some are occasionally cut down a little to a close head in autumn or winter, to force out a greater quantity of flowers, which however will probably be proportionally smaller; though those who want them for sale in the markets, &c. endeavour to procure as large a quantity as possible; however, in their culture in borders, shrubberies, and other compartments for ornamental flowering, they should be mostly permitted to run up, with moderately full heads, and kept to some regularity, as above.

But where large quantities of the flowers are required, particularly for sale, as is the case about London, the gardeners generally plant the shrubs in close rows, forming a sort of hedge, putting them in by *trench-planting*, a foot distance in the row; and in their culture keep them down to one, two, or three feet high, according to the sorts, by shearing or clipping them annually, in autumn or winter, at top and sides, in order to force out a greater quantity of laterals the following year for flowering, as before observed.

Some plants of the best sorts may also be planted against a warm wall, to forward their shooting for an early bloom; a few of the Monthly Roses in particular, also the Provence kinds, and cinnamon Rose, &c. But as the Monthly Rose shoots early in the spring, as formerly hinted, it is always proper to have some plants of that sort against some warm fence, both for shelter, and to forward the bloom.

A few plants of the best sorts of Roses should also be potted to move occasionally to adorn any particular compartment.

Likewise, where there is convenience of forcing-frames, or hot-houses, &c. it is proper also to pot some prime sorts to force for an early spring bloom; for by aid of the above departments of artificial heat, Roses may be forwarded to flowering in winter, or early in spring; for which purpose, having some plants of the monthly Rose, common Provence, and Moss Provence, or any other choice sorts, in pots, which in winter may be placed in any forcing-frames, worked either by dung, bark, or fire heat, or placed in a hot-house, they may be brought to flower in January, February, and March, and continued in succession till the plants in the natural ground begin to

flower, by having different supplies of plants placed for forcing at two or three weeks' interval. A quantity of plants should generally be potted for this use annually, and if they have a summer's growth in the pots, plunged in the ground, previous to the time of forcing, they will be more firmly rooted, so as to flower in greater perfection. See FORCING-FRAME.

Many of the gardeners about London erect forcing-frames, or glass-houses, with bark-pits on purpose for forcing Roses, as they are generally ready sale, at an early season, both the pots of plants in flower, and the Roses gathered as nosegays; and fetch an extraordinary great price, which pays sufficiently for forcing.

Method of Propagation.

The propagation of all the sorts of Roses is by suckers—layers—budding—and some sorts by seeds. But suckers is the most common and expeditious method for propagating most of the species.

By Suckers.—Most of the sorts of Roses send up many suckers annually from the root, attaining from one or two to three or four feet height, or more, in one summer; and by these the shrubs may be expeditiously propagated in great plenty; they may be taken up in autumn, winter, or early in spring, with some radicle fibres to their bottom; and the strongest may be planted out finally, and the weakest in nursery lines for a year or two, or longer; they will readily grow, and will most of them produce flowers the following summer.

When these shrubs have grown into large bunches, with many suckers grown up to stems from the root, the whole may be taken up and slipped, or divided into so many separate plants, and planted out, as above.

Observe, that as the Moss Rose, Musk Rose, Apple-bearing Rose, and some others, furnish suckers but sparingly, so in default thereof must have recourse to layers, or budding; particularly for the Moss Provence.

By Layers.—All the sorts of these plants will grow by layers of the young shoots; and is an effectual method of propagation, for such sorts in particular, that sparingly furnish suckers, as the Moss Provence, &c. as aforesaid; and that to obtain plenty of shoots for laying, a quantity of the plants should be planted for stools; which being headed down low, they will throw out plenty of shoots near the ground in summer, for laying in autumn or winter following, by slit-laying, they will be rooted by next autumn, and fit for transplantation, in nursery rows; though sometimes the Moss Rose, &c. require two years before they are tolerably well rooted; but of these

these sorts, you may also try layers of the young tender shoots of the year, layed in summer, any time in June, they will probably root a little the same season. However, the layers of all the sorts, after being properly rooted, should be taken up in autumn, and planted in the nursery, to have one or two years' growth, or to remain till wanted.

By Budding.—This is sometimes practised in propagating some choice sorts that seldom send up suckers freely, such as the Moss Provence, &c. as aforesaid; also, when intended to have two, three, or more different sorts of Roses upon the same tree, for curiosity; working them upon the Frankfort, or any other strong-shooting Rose-stocks raised from suckers.

By Seeds.—This is sometimes practised to try to obtain new varieties; also sometimes for raising some particular permanent species, such as the Canine Rose, Burnet-leaved Rose, Scotch Rose, Apple-bearing Rose, single Sweet Briar, and such others as continue the same by seedlings; sowing them generally in autumn soon after they are ripe, and they will sometimes rise the following spring; as, if not sown till the spring season, most of the sorts are apt to remain till the second year before they rise freely; sow them however, in any bed of light earth, either in shallow drills, or all over the surface, covering them half an inch deep; and when the seedlings are a year old, transplant them in nursery-rows.

Observe, however, that the double kinds, and other particular varieties of the species in general, cannot be continued the same with certainty by seeds, so must always be propagated by suckers or layers, &c.

But the common single Sweet Briar, when required in any considerable quantity, should generally be raised from seed, sowing it in drills half an inch deep, either to remain, or for transplantation; though when designed to form a sort of hedge of this plant, to produce a crop of shoots to cut for the supply of markets during the summer, it is eligible to sow the seed at once in a drill where the plants are always to stand.

ROSMARINUS, Rosemary.

It consists of one hardy shrubby ever-green, comprising some varieties, proper for the kitchen-garden and shrubbery; all of which are adorned with narrow stiff leaves, and numerous, small, monopetalous, ringent flowers along the sides of the shoots.

Class and order, *Diandria Monogynia*.

Characters.] CALYX is monophyllous, the mouth erect and bilabiate, the upper lip, being entire, the under one bifid. COROLLA

is monopetalous, tubular below, and ringent above, having the upper lip short and bifid, and the under one reflexed and trifid, with the middle segment largest. STAMINA, two subulate filaments, inclining towards the upper lip, and simple antheræ. PISTILLUM, a quadrifid germen; a style like the stamina, of the same length and situation, and a simple acute stigma. PERICARPIUM, none; four oval seeds lodged in the calyx.

The species is,

ROSMARINUS *officinalis*.

Common *Officinal Rosemary*.] Hath a shrubby stem branching numerously from the bottom upwards, growing five or six feet high, closely garnished with narrow, linear, stiff leaves; and numerous small purplish flowers all along the upper part of the branches.

Varieties.] Common narrow-leaved Rosemary—broad-leaved—silver-striped-leaved—gold-striped-leaved.

All the varieties are tolerably hardy ever-greens, though the common green sorts are the hardiest; the striped kinds are liable to suffer by hard frosts, if much exposed, or planted in wet ground, so should have a warm situation and dry soil; some of these variegated kinds should also be potted, in order to have shelter of a green-house in winter. It should also be observed, that all the varieties of Rosemary should generally have a dry soil; and if poor, sandy, gravelly, or rubbishy, they will be more durable than in moist, rich land: in wet soils in particular, they are very liable to perish in rigorous winters. However, all the sorts will succeed in any common earth in a dry situation.

As to their uses in gardening, the common green sorts are employed as medical plants, &c. and both green and variegated kinds claim admittance in the shrubbery, to increase the variety in the evergreen collection, allowing them a dry soil, and the striped sorts in particular a warm situation, as above observed: plant some of these sorts also against a warm fence, as a place of greater shelter to protect them in winter.

But it is proper always to keep a few plants of the striped sorts in pots, and place them for winter protection from severe frost, either in a green-house, in which they will also effect a pretty variety; or in a glass-case, or deep garden-frame, &c.

The leaves and flowers of Rosemary are used in medicine.

Method of Propagation.

They are all easily propagated by slips or cuttings, and by layers.

By Slips and Cuttings.—In March, April,

or May, slip or cut off a quantity of young shoots, from about five or six to eight or ten inches long, and strip off the lower leaves; then plant them in a border of light earth, in rows a foot asunder, and give a good watering, repeating it frequently till they are rooted, which they will effect in a short time, the same year, shoot at top, and become tolerable little plants by autumn, when about the beginning or middle of September, or in spring following, they may be transplanted where they are designed to remain.

By Layers.—In spring, summer, or autumn, lay down any of the convenient lower young branches in the earth, they will be well rooted by autumn following.

ROYENA, African Bladder Nut.

The plants are shrubby evergreen exotics for the green-house collection: garnished with oval and spear-shaped leaves, and monopetalous, five-parted, reflexed flowers along the sides of the branches.

Class and order, *Decandria Digynia*.

Characters.] CALYX is monophyllous, five-parted at top, and permanent. COROLLA is monopetalous, with a tube the length of the calyx, and divided above into five oval reflexed segments. STAMINA, ten very short filaments having oblong, didymous, erect antheræ. PISTILLUM, an oval germen, two styles, and simple stigmas. PERICARPIUM, an oval, quadrifurcated and quadrivalved, unilocular capsule, having four oblong triangular nuts.

The species are,

1. ROYENA *lucida*.

Lucid African Bladder Nut.] Hath a shrubby upright stem, branching eight or ten feet high; oval, somewhat rough but shining green leaves, placed alternately; and white flowers at the sides of the branches.

2. ROYENA *glabra*.

Glabrous African Bladder Nut.] Hath a shrubby upright stem, branching five or six feet high; small, lanceolate, smooth leaves; and small white flowers at the sides of the branches.

3. ROYENA *hirsuta*.

Hairy African Bladder Nut.] Hath a shrubby upright stem, branching alternateways, six or seven feet high, lanceolate hairy leaves; and purplish flowers at the sides of the branches.

These three shrubs being natives of the Cape of Good Hope, require shelter here in winter, so must always be kept in pots, and placed among the green-house plants; when they will form a good variety, as ever-green and will flower in July or August; but the

flowers are small, and of but little beauty, succeeded sometimes by ripe capsules, particularly the first and second sorts; their culture is the same as other shrubby green-house plants.

They are propagated by seed, layers, and cuttings.

By Seed.—Sow it in spring, in pots, and plunge them in a bark-bed, or other hot-bed; and when the plants are three or four inches high, pot them off separately.

By Layers.—Lay the young shoots of the year in summer, as they are unapt to strike in the older wood.

By Cuttings.—In spring, plant some young shoots in pots, and plunge them in a hot-bed.

RUBIA, Madder.

This genus furnishes two noted hardy herbaceous perennials, valuable for their roots, as a most useful commodity in dying red; they having thick succulent roots; long, thick, procumbent stalks; spear-shaped radiant leaves; and campanulate, four-parted, yellow flowers in spikes at the ends of the branches.

Class and order, *Tetrandria Monogynia*.

Characters.] CALYX is small, placed on the germen, and four-parted. COROLLA is monopetalous, bell-shaped, and four-parted at top. STAMINA, four awl-shaped, short filaments, having simple antheræ. PISTILLUM, a didymous germen under the calyx; slender style bifid at top, and headed stigmas. PERICARPIUM, two smooth berries joined together; each having one roundish umbilicated seed.

The species are,

1. RUBIA *tinctoria*.

Common Dying Madder.] Hath a long, thick, fibrated, fleshy, reddish root, sending up large, four-cornered, jointed, procumbent stalks, five or six feet long, branching by pairs, crossing alternately; garnished at each joint with six spear-shaped leaves in a verticillus, or radius; and small yellow flowers, collected in loose spikes at the sides and ends of the branches.

It is a native of Italy, and about Montpellier in France, but grows freely here in the open ground.

2. RUBIA *peregrina*.

Foreign, or quaternate-leaved Madder.] Hath thickish, fibrated, spreading roots; slender, four-cornered, procumbent, branchy stalks; garnished at each joint with quaternate, short, rough leaves, and clusters of yellow flowers.

This sort is supposed to grow naturally in England; but probably mostly of foreign growth in Turkey, and some other parts.

Both these species of Madder are herbaceous, of hardy growth; perennial in root, send

up stalks in spring, and flower in June and July, succeeded by seeds in autumn; but those of the *Rubia tinctoria* do not always ripen in England; it however multiplies exceedingly by suckers for propagation.

These plants are sometimes cultivated in gardens, in any open compartments, for variety.

But the chief merit of the plants is in their roots, to use for dying red, &c. And are also used in medicine, which taken inwardly, tinges the urine of a deep red colour; but the *Rubia tinctoria*, in particular, is in greatest estimation for the dyers' purpose, and is cultivated in great quantities in fields abroad, in Holland, &c. for the roots aforesaid, as a very valuable commodity both for the dyers and calico printers; being propagated generally by suckers, or off-sets, which are taken off in the spring, and planted in a light deep soil, in rows two feet asunder, and require two or three years' growth for the roots to attain perfection. They are also cultivated in some parts of England for profit, as they are hardy enough, and increase abundantly by off-sets or suckers from the root, and are sometimes raised in tolerable perfection. However, as in some parts, after repeated experiments in its cultivation, the crops have no ways answered the purpose, occasioned probably by the soil not being suitable, or not properly planted and managed; therefore, at the first trial, it is advisable to plant only a small quantity in different situations; and by observing the soil and method of culture of those which succeed best, it may be a direction to the culture of larger quantities; and where crops of it succeed, it proves a very saleable article, and pays exceedingly well for its cultivation; and the roots may either be sold to the dyers, or druggists, or those who prepare them for use; though abroad the great Madder planters erect stoves and kilns for drying it; and stamping-mills for reducing it to powder, to render it more portable to send to distant countries; but the roots for home consumption may also be used fresh for dying; first washing them clean, then cut to pieces, and pounded in a mortar, and then put into the cauldron, or dying copper.

Their Propagation and Culture.

They are propagated by off-sets or suckers, arising from the roots of old plants in the spring; and should be slipped off soon after they appear above ground; at which time, opening the earth round the roots, slip off the side suckers with as much root part and fibres to each as possible, preserving the tops entire; which should be planted directly, as advised below.

The season for taking off the suckers and planting them is about the beginning, middle, or end of April, or beginning of May, when they appear above ground.

Observe, these plants delight in a light, rich, deep soil, or a light, deep, pliable, loamy land; and rather a somewhat low than high situation; which should be deeply digged or ploughed in autumn, or winter; laying it in rough ridges to mellow and pulverise by the weather; and in spring levelled down for the reception of the plants; but for large quantities in fields, the ground should be ploughed cross-ways again, once or twice in the spring, and well harrowed.

Then in April, or early in May, provide a proper quantity of sets, or suckers, as aforesaid; and with a dibble plant them in rows two feet asunder, and one distant in the row, putting each plant low enough in proportion to the length of its root, leaving most of the green top out of the ground, and close the earth well about each set, as you go on; thus they will soon take root, and shoot at top. But some set these plants in beds, three rows length-ways, at two feet distance, with wide alleys between bed and bed, in order for landing up the crown of the roots two or three inches deep, in winter.

In either mode of planting, they will shoot up into stalks the same year; but the roots will require two or three years' growth before they are large enough for use; during which period, observe the following culture.

Keep them clean from weeds all the summer by broad-hoeing, in dry weather; and in autumn, when the stalks decay, cut them down, then slightly dig the ground between the rows, raising it somewhat ridge-ways along the rows of plants, an inch or two thick over their crowns; or if they are in beds, they may be landed up from the alleys the above depth. Next spring the roots will shoot up again stronger than before, keep down weeds, and the plants will soon cover the ground; in autumn following, the decayed haulm must be again cut down, and all weeds cleared away; slightly dig the ground, &c. as in the former year; and next spring the plants will still rise stronger, and the roots continue increasing in size; so as by the following October, having had three summers' growth, they will be fit to take up for use.

The method of taking up the Madder-roots is by trenching the ground the way of the rows; beginning at one end of the ground, and open a two feet wide trench close along by the first row of plants, digging down to the depth of the roots to get them clean out to the bottom;

bottom; then opening another trench close to the next row, turning the earth thereof into the first; and so proceed trench and trench till the whole is taken up.

The madder roots, thus taken up for use, are sometimes used fresh for dying, preparing them by washing, and pounding them as before observed. But commonly when designed for keeping, or to be sent to a distance, are dried in some covered airy shed; then all mould being rubbed off, and the roots sufficiently dry, they may then be sold to those who manufacture them for use, if not performed by the cultivator; which consists of kiln drying them, or drying them in some stove-house, &c. then threshed to beat off the outer skin, in order to separate it from the inner part of the root, as being of inferior quality. The roots being then dried in a kiln about twenty-four hours, are removed to a mill, or pounding-house, where they are pounded in a long hollow oaken block, with stampers kept in motion by the mill; and when thus reduced to powder, is sifted and put up in casks for use.

But in Holland, where great quantities of this plant is cultivated, they have public kilns, mills, &c. where the cultivators send the roots to be manufactured. And there are treatises to be had here, exhibiting the kilns, mills, and other necessary accommodations for manufacturing this valuable material; together with full directions in the management thereof.

RUBUS. Bramble, and Raspberry-bush.

Consists of under-shrubby and herbaceous perennials, valuable, some as fruit-bearing plants, and others for variety in the pleasure ground, particularly the shrubby kinds; some being of erect growth, others long trailers, garnished with pinnated, ternate, and palmated leaves, in different species; and pentapetalous, icofandrous flowers.

Class and order, *Icosandria Polygynia*.

Characters.] **CALYX** is monophyllous, five-parted and permanent. **COROLIA**, five-roundish erecto-patent petals. **STAMINA**, twenty or more short filaments, having roundish compressed antheræ. **PISTILLUM**, numerous germina, many capillary styles from the sides of the germens, crowned with permanent stigmas. **PERICARPUM**, a compound berry, composed of many roundish unilocular acini, each having one oblong seed.

There are many species, nine or ten of which are ligneous and shrubby; the others are somewhat herbaceous; but the most material sorts are principally of the ligneous, or shrubby kind, and of which about five or six of the most noted species are cultivated in our gardens; the first of which, *Rubus Idæus*, or Raspberry-plant, is chiefly valued for its fruit;

and the other sorts as furniture for the shrubbery, &c. They are all deciduous plants of hardy growth, that succeed in any common soil and situation; and consists of upright ligneous kinds, trailing shrubby kinds, and herbaceous kinds.

Upright ligneous Kinds.

Under this head is comprised the common Raspberry-plant, and varieties; and other Raspberry Kinds. All of which rising with several upright ligneous, or under-shrubby stems, from about three or four to six or seven feet high.

I. **RUBUS Idæus.**

Common Raspberry Bush.] Rises with several upright, straight, ligneous, pithy stems from the root; four or five feet high, closely armed with short prickles; pinnated, three and five-lobed rough leaves; and at the axillas and ends of the lateral shoots, small clusters of purplish, and white flowers, succeeded by ripe berries in July.

Varieties.] Purple-flowered Raspberry—white-flowered Raspberry—common red-fruited Raspberry—white-fruited Raspberry—twice-bearing red and white Raspberry, producing the first crop of fruit in July, and the second in September; and is esteemed a curiosity—smooth or cane Raspberry, the stalks, &c. being devoid of armature—large Antwerp Raspberry; strong tall stems, and large fruit.

The common red sort grows wild in woods in England, but has been greatly improved by garden culture.

All the varieties bear plentifully, they being all propagated by suckers, planted in any open situation, in rows four or five feet asunder, and a yard distant in the rows; being planted in autumn, winter, or spring, they bear the summer following. Their mode of bearing is upon the year-old wood; that is, a supply of shoots or stems rising annually from the root; which, when a year old, send out many small laterals, and upon these the fruit is produced the same year; remarking, the same individual stems never bear but once; a succession of young shoots or stems being sent up annually from the root every summer for bearing; those produced one year, bear the fruit the next, and then totally decay to the root, in winter following; they never surviving to bear a second year, but are always succeeded by a plentiful supply that have arisen from the bottom in summer for next year's bearing; so that every winter, all the decayed stalks that bore the fruit the preceding summer, must be cut or broken down close to the ground; they being readily distinguished from the young succession stems, which at the same time must be regularly thinned to four or five of the strongest

shoots on each root; and these should be topped to about three or four feet height, or a little more or less, according to their strength, and they will all branch out laterally the following spring; and upon the laterals the flowers and fruit are produced.—See the *Propagation and general Culture*.

The Raspberry is in estimation both as eatable fruit, and for many culinary purposes, as for tarts, sauces, Raspberry wine, &c.

2. RUBUS odoratus.

Odoriferous Virginia flowering Raspberry.] Rises with many upright, large, under shrubby, brown, inermous stems, from the bottom, five or six feet high; very large, simple, palmated leaves; and the shoots terminated by many large purplish flowers, succeeded by small red fruit; rarely ripening in England.

This plant is very ornamental, having beautiful large foliage, and numerous large flowers: continuing near two months, which renders it worthy of admittance in every shrubbery plantation; where it will multiply exceedingly by suckers sent up annually from the root all around.

3. RUBUS occidentalis.

Occidental, or Canada Black-fruited Raspberry.] Rises with erect, ligneous, prickly, purplish stems four or five feet high; ternate leaves, hoary underneath, having round footstalks; and the shoots terminated by clusters of small flowers, succeeded by small black fruit.

Trailing Shrubby Kinds.

Consists of the common Bramble, and varieties; and some others of the Bramble kind, being mostly shrubby trailers, of hardy growth, and deciduous.

4. RUBUS fruticosus.

Shrubby Rubus, or common Bramble of the Hedges.] Hath very long, shrubby, trailing, channeled, greenish, and reddish stalks closely armed with strong crooked aculei; digitated, five and three lobed leaves, having prickly petioles; and all the lateral shoots terminated by clusters of white flowers, succeeded by ripe black berries in autumn.

Varieties.] Common Bramble, or Blackberry plant of the hedges—double blossomed Bramble of the gardens—white-fruited Bramble—inermous, or thornless Bramble—cut-leaved Bramble—striped-leaved Bramble.

All these varieties are of trailing growth, with very long, luxuriant, durable shoots. The common wild bramble, or Blackberry plant, being the parent species, which grows wild on banks, and in field-hedges, almost every where; so is seldom admitted in gardens, except a plant or two for variety among the climbing-tribe, or where wilds or thickets are

intended. But the double blossomed Bramble, white-berried, and thornless kind, &c. being curiosities, they claim admittance in every shrubbery; and may be trained both as climbers, allowing them support of bushes or stakes; or may be trained as standard shrubs, if staked, and pruned down at top, to cause them to shoot out into bushy heads, continuing to reduce the rambling shoots as occasion requires, to keep the head to the desired form; and where any part of a garden is designed to represent wilds, &c. some plants of all the varieties should be introduced, and suffered to shoot and run according to the course of nature.

5. RUBUS cæsius.

Blue-berried Bramble, or Dewberry-bush.] Hath long, cylindric, slender, trailing, prickly stalks; ternate, almost naked leaves; and whitish flowers at the sides and ends of the branches, succeeded by large sky-blue fruit in autumn.

It grows naturally in moist situations in England, and is sometimes admitted into gardens for variety.

6. RUBUS hispídus.

Hispid Canada Bramble.] Hath long, ligneous, procumbent, hispid stalks; ternate, naked, cut, ferrated leaves, with hispid footstalks.

Herbaceous Perennial Kinds.

Comprises two dwarfish, somewhat herbaceous, durable plants of erect growth, rising but a few inches high.

7. RUBUS Chamæmorus.

(Chamæmorus) Dwarf Mulberry, or Cloudberry.] Rises with slender inermous stalks, six or eight inches high; garnished with two simple, lobated leaves; and the stalks terminated by one purple flower, succeeded by a small black fruit, resembling a mulberry.

It grows naturally in England and Scotland, &c. in high moorish situations.

8. RUBUS arcticus.

Northern Rubus, or Dwarf Siberian Bramble.] Rises with erect inermous stalks, but three or four inches high; ternate leaves, and the stalks terminated by purple flowers, singly; succeeded by small red fruit, having the smell and taste of strawberries.

All the above eight species of *Rubus* are for the general part deciduous, the leaves coming out in the spring, and fall off in the winter; and they flower generally in June and July. The flowers are composed each of five roundish petals, and numerous stamina, succeeded by roundish compound berries, each being composed of many small acini of a pulpy juicy nature; ripening from July till October, in different sorts: remark-

ing.

ing, those of the *Rubus Idæus* and varieties are the principal sorts for general use.

The plants of all the species are very hardy; the ligneous, and shrubby kinds, in particular, will prosper almost any where. But the herbaceous kinds, being naturally residents of moorish or fenny places, require some similar situations when cultivated in gardens.

With respect to the merit of all the sorts as garden plants, observe as follows.

The first species, *Common Raspberry*, and varieties, demand culture in every garden for their fruit; all of which are great bearers: but for the general plantations, chuse principally the common red and the white kind, as being generally the greatest bearers of all. Planting also a share of the twice-bearing sort, both as a curiosity, and for the sake of its autumnal crops of fruit, which, in favourable seasons, ripen in tolerable perfection; likewise introduce a portion of the Antwerp kind, for its large fruit: observing to allow all the sorts some open exposure in the kitchen garden, or any other district occasionally, as they will prosper in almost any situation. It is however advisable to plant the general plantations mostly in a free exposure, in rows a yard and half asunder: some plants may also be disposed singly about the borders or shrubby clumps, for variety: and, in all the modes of planting, they should generally be kept to single bunches of four or five stems on each root or stock. See their *Propagation and general Culture*.

The other seven species are considered as plants of variety, for hardy plantations in the shrubbery: some of which are also very ornamental flowering plants; particularly the Virginian flowering Raspberry, the occidental kind, and the double-blossomed Bramble; all of which having great merit as furniture for ornamental compartments: and the white-berried Bramble is a great curiosity. All the other species and varieties serve to diversify large collections.

Propagation and Culture of the common Raspberry and Varieties

The propagation of the common Raspberry and varieties is expeditiously effected by suckers from the root; all the sorts sending up great numbers on all sides annually, growing from three to four or five feet height the same year, and form proper plants by autumn or winter following, for transplanting for new plantations, and will all bear fruit the following summer.

Therefore, any time from October till March, in open weather, having recourse to some good bearing plantation of Raspberry

plants of some standing; and proceed to take up a sufficient quantity of last summer's suckers, that are situated around the outside of the stools, or main stock, raising them carefully with plenty of fibres; and, having obtained a proper quantity, then let them be trimmed for planting, shortening any long straggling roots, and, if any naked woody parts of the root of the old stool adhere, cut it off; observing at the same time, if one or more buds appear near the root, they being the embryo of future shoots, must be very carefully preserved: and shorten each sucker at top, to about two or three feet long, or more, according to their strength; they are then ready for planting: having, previous to this, chosen an open spot of good ground, as before advised, and having well dunged and trenched it one or two spades deep, proceed to put in the plants above prepared, as soon as possible.

With a line mark out the distances for the plants, in rows, a yard and a half distance, and a yard asunder in the rows, which is considerably more than is commonly allowed: but, if planted much closer, the plants, as they send up numerous suckers in summer, would grow so close, as to form quite a thicket, so as to exclude the due influence of sun and air from the fruit, as well as to render it troublesome to get between the rows occasionally, to gather the produce; therefore allow the above distances: and having drawn lines accordingly, proceed with a spade, and open small apertures in the ground, close along the line, one for each plant, a yard asunder, planting them as you go on, one in each hole erectly, or, if plenty of seeds, may put two or three in a hole, at some little distance from one another: covering in the roots properly with the earth, treading it moderately firm, to preserve the upright position of the plants: observing, if the planting is performed late in the spring, it is advisable to give a good watering, and repeat it occasionally, till the plants have struck fresh root.

Having thus made a plantation of Raspberries, they will readily take root, and set to growing freely in the spring, they being naturally of a free growth, and most of them will bear tolerably the first summer; but in the second they will bear a full crop in the utmost perfection.

As to their general culture, it consists of the following operations—Keeping them clean from weeds all summer by broad hoeing; giving them an annual dressing in autumn or winter, consisting of breaking or cutting down the decayed stems that bore the preceding summer; thinning the young succession bear-

ers; clearing away all intermediate suckers between those of the main stocks, and then dig the ground between the rows of plants; observing the following particulars of the method of performing the operations of their annual dressing.

Previous to the above-mentioned annual dressing of Raspberries, observe, as we before noticed, of their mode of bearing, that as they produce a fresh supply of shoots or suckers every year from the bottom for bearing, those produced one year bear the next, then totally decay to the root in winter, there being at the same time a succession of last summer's shoots, on the same stools, for bearing the summer following: therefore, in the annual dressing, which may be performed any time from October till March, first proceed to clear out all the decayed stems, being last summer's bearers, cutting or breaking them down close to the bottom; then examine the supply of young shoots for the next year's bearing, selecting three or four, but not more than five or six of the strongest on each stool, cutting all the others away close to the ground: likewise draw up all straggling suckers between the main plants; all of which remaining plants should be shortened according to their strength, cutting them generally a little below the bend at top of the shoots, to about three or four feet in length, both to render them more robust to support themselves more firmly upright in summer, and to promote a stronger supply of laterals for flowering and fruiting. Or if you should choose to leave them longer, or at full length, those of each stock may be plaited or tied together, in order to support each other erect: then having cleared away all the rubbish, let the ground between the rows be neatly dug one spade deep. As you proceed in digging, clear out all the roots of straggling suckers between the rows, &c. leaving the earth close and level about and between all the plants: thus far is the whole necessary culture of a plantation of Raspberries, which must always be repeated annually, at the seasons abovementioned.

Allow them a little manure of rotten dung once every two or three years, applying it in the winter dressing, and dig in one spade deep; it will add vigour to the plants, so as to continue them producing fruit in great perfection several years.

However, it is advisable to make a fresh plantation every four, five, or six years, in a fresh spot of ground, as after that period of time, the plants, although they may continue shooting with tolerable vigour, yet they are apt to be less fruitful, and the fruit smaller

than in younger plantations in a fresh prepared piece of ground.

Propagation, &c. of the other Species.

The propagation of the other species of Raspberries, Bramble, &c. is by suckers, layers, cuttings, dividing the roots, &c. and the two herbaceous kinds also by seed.

By Suckers.—All the Raspberry kinds in particular send up many suckers annually, and by which they may be propagated in great abundance, taking them up in autumn, winter, or spring, with roots; and the strongest may be planted at once into the shrubbery, and the others in nursery rows for a year or two, or till wanted.

By Layers.—All the Bramble kind are easily propagated by this method; laying the shoots almost any time, they will readily emit roots at every joint, and be fit to transplant in autumn following.

By Cuttings.—By this method also may the Brambles be propagated in autumn; cutting off some of the younger shoots, and divide them into lengths a foot long, and plant them in a shady border; many of them will strike.

By dividing the Roots.—Any of the Raspberry kind, &c. and the herbaceous species, when increased into large bunches, may be divided or slipped into several distinct sets, and plant them separately.

By Seed.—As the two herbaceous species do not always increase freely by roots in gardens, therefore, in default of which, procure some of the ripe fruit in autumn, or as soon as possible; and chusing some moist situation, either in a nursery, or where you design the plants to remain, sow the seed half an inch deep; observing, if some of the plants are permitted to remain where raised, they will probably be more prosperous than such as are transplanted.

RUDBECKIA, Dwarf American Sunflower.

This genus comprehends several herbaceous flowery perennials, and a biennial, serving to embellish the pleasure ground; rising with annual stalks, from about half a yard to six or eight feet high, garnished with oval, spear-shaped, and divided leaves; and the stalks terminated by large compound radiated flowers.

Class and order, Syngenesia Polygamia Frustanea.

Characters.] CALYX, a general calyx, composed of two orders of broad, plane, short, scaly leaves, containing many florets. **COROLLA** is compound, and radiated; consisting of many tubular, hermaphrodite florets in the disk, and spear-shaped, flat, neuter, barren

ren florets in the radius. STAMINA, five very short hair-like filaments, having cylindric antheræ. PISTILLUM, a tetragonous germen, filiform style, and bipartite revolute stigma. PERICARPIUM, none; the hermaphrodite florets are succeeded each by one oblong seed, quadridented, and crowned with down, and all the seeds lodged in a conic chaffy receptacle.

There are about six species in our gardens; five of them herbaceous perennials, and the sixth a biennial, all natives originally of North America; but grow freely here in our gardens, in any open compartments.

Perennial Kinds.

1. RUDBECKIA *hirta*.

Hairy Dwarf American Sunflower.] Rises with upright stalks, a foot and half high; oval-spatula-shaped, undivided, triple-nerved leaves; and the stems dividing upward into many long pedunculi, terminated each by one large radiated yellow flower, having a prominent purple disk, and the petals of the radius emarginated.

2. RUDBECKIA *purpurea*.

Purple Dwarf American Sunflower.] Rises with upright stalks about two feet high; oval-lanceolate, undivided, alternate leaves; and the stalks and branches terminated by purple flowers, singly; having the petals of the radius bifid.

Varieties.] With a dark-purple disk, and pale red radius—with long purple petals in the radius—with broad petals in the radius.

3. RUDBECKIA *laciniata*.

Jagged-leaved Tall Virginian Rudbeckia.] Rises with upright stems, six or eight feet high; large, compound, mostly five-lobed leaves, having the lobes deeply laciniated, or jagged; and the stems and branches terminated by radiated yellow flowers.

Varieties.] Broad-leaved—narrow-leaved—purple-stalked, with digitated leaves, &c.

4. RUDBECKIA *angustifolia*.

Narrow-leaved Dwarf American Sunflower.] Rises with upright firm stems, two or three feet high, or more; long, linear, or very narrow, entire, opposite leaves; and the stalks terminated by yellow-rayed flowers, having a dark-red disk.

5. RUDBECKIA *oppositifolia*.

Opposite-leaved Dwarf American Sunflower.] Rises with upright stalks two or three feet high; lanceolate-oval, serrated, opposite leaves, and wholly yellow flowers, having the petals of the radius bifid.

Biennial Kind.

6. RUDBECKIA *triloba*.

Three-lobed Virginian Rudbeckia.] Hath

spatula-shaped, trilobed, radical leaves; amidst them upright stems, garnished also with three-lobed leaves; but those on the branches are undivided; and yellow-rayed flowers, having dark-purple disks.

All these six species flower here annually in July and August; often continuing in succession till September or October; and in some sorts, are sometimes succeeded by ripe seeds in autumn, particularly the first and last species.

They are all tolerably hardy: the first five species are mostly perennial in root, but annual in stalk; though the fourth and fifth sorts have often a tendency to a biennial nature; however, the sixth sort is perfectly biennial; all of which send up their flower-stems in the spring, which generally branch out upward, the branches terminated by long pedunculi, each crowned by one moderately large radiated flower, nearly resembling the common sunflower, but smaller; have generally a prominent, somewhat pyramidal disk, and a spreading radius; and are all very conspicuous, even at a distance.

All the species are proper furniture for the open compartments of the pleasure-ground, as being very showy plants when in bloom; and produce many flowers in succession, two or three months; effecting a good ornamental appearance.

Observe to allow most of the sorts a lightish, dry soil, and somewhat warm situation; remarking however, the third sort in particular (*Rudbeckia laciniata*) will succeed almost any where.

Method of Propagation, &c.

Their propagation is by off-sets, and parting the roots, and by seeds.

By off-sets, and parting the roots.—This is practicable for all the perennial kinds; but the first sort in particular generally resolves itself into several off-set heads, at the crown of the root, which being slipped in autumn, or early in spring, each will form a proper plant. Most of the other perennial sorts increase by the root, though the *Rudbeckia purpurea* multiply rather more sparingly than the others; however, the propagation of all the sorts may be effected less or more by parting the roots in autumn, when the stalks decay.

Observe, as some of the perennial kinds sometimes discover a tendency to go off in three or four years, it is eligible to continue propagating them frequently to keep up a stock of vigorous plants. Some sorts being also sometimes inclinable to a biennial nature, are apt to decay soon after they have flowered, without increasing at root, for future propagation, particularly the fourth and fifth sorts;

forts; to prevent which, it is proper to cut down some of the flower-stems of such kinds in May, or early in June, which will encourage their multiplying more effectually by root off-sets, fit for slipping next autumn.

By Seed.—All the sorts may be raised plentifully from seed; but the biennial sorts in particular must always be raised from seed annually; likewise, such of perennials as are biennially inclined; sowing the seeds in April, in a border of light earth, and rake them in; and when the plants are two or three inches high, prick them out in nursery-rows, till autumn; then transplanted where they are finally to remain.

RUMEX, Dock; comprehending the *Acetosa*, or Sorrel, &c.

This genus furnishes herbaceous perennials for the kitchen-garden, and pleasure-ground, and a ligneous ever-green for the green-house; are garnished with simple, oblong-sagittated and roundish, heart-shaped leaves; and spikes of small tripetalous flowers of no beauty.

Class and order, *Hexandria Trigynia*.

Characters.] CALYX, three obtuse, reflexed, permanent leaves. COROLLA, three small oval, connivent, permanent petals, like the leaves of the calyx, but larger. STAMINA, six very short capillary filaments, having erect didymous antheræ. PISTILLUM, a turbinate triquetrous germen, three hair-like reflexed styles, and large lacinated stigmas. PERICARPIUM, none; a single triquetrous seed, lodged in the permanent corolla.

To this genus, *Rumex*, is added the *Acetosa* or Sorrel, formerly considered as a distinct genus, consisting of several species, but now all ranged as species of *Rumex*, which comprehends in the whole many herbaceous, and one woody species; eight or ten of the former grow wild in this country, and the others are of foreign growth; but there are not more than four or five that have merit for garden culture; consisting of four hardy herbaceous perennials, and one tender woody plant.

Hardy Herbaceous Kinds.

Under this head is comprised the common culinary Sorrels for the kitchen-garden; the Patience Dock, &c. and Bloody Dock, for medical purposes, and variety; all of which are hardy perennials.

The two first sorts are of the Sorrel kind.

1. RUMEX *Acetosa*.

(*Acetosa*)—or Common Arrow-pointed Meadow Sorrel.] Hath fibrated roots, crowned by a large tuft of oblong-sagittated leaves; and amongst them upright stems a foot or more

high, terminated by spikes of small herbaceous dioecous flowers succeeded by ripe seeds in autumn.

Varieties.] Common Meadow-sorrel—Barren Northern Sorrel, which rarely running to seed continues almost always in leaf for use—broad-leaved Mountain Sorrel.

The Common Sorrel is a natural resident of our meadows and pastures; but has been long admitted an inhabitant of the gardens as a soup-herb; and is the most commonly cultivated Sorrel for general use, both as a valuable acid culinary herb, and for medicinal purposes; its leaves being the useful part, which by garden culture obtain a fine large size.

The plants are easily raised from seed, and by parting the roots. See their *Propagation*, &c.

2. RUMEX *scutatus*.

Shield-shaped Rumex, Round-leaved, or French Sorrel.] Hath a creeping root crowned with a tuft of large roundish-heart-shaped, hastated leaves; rambling shoots, and the flower stems terminated by spikes of small hermaphrodite flowers, succeeded by seeds in autumn.

This species of Sorrel is by many preferred to the common *Acetosa*, or Meadow Sorrel; the leaves being larger, and thought to possess a more agreeable acid relish.

The above two species of Sorrel and varieties are all of the culinary kind; any or all of which may be raised for general use; and may, all but the Barren Sorrel, be propagated by seed: all the sorts also by parting the roots, planting them in any bed or border, ten or twelve inches asunder, and they will furnish leaves most part of the year.

3. RUMEX *Patientia*.

Patience Dock, or Monk's Rhubarb.] Hath a large, thick, divided, deeply-striking root, yellow within, crowned with large, oblong-heart-shaped leaves, a foot long, on very thick reddish foot-stalks; upright strong stems, dividing and branching three or four feet high; having the branches terminated by close erect spikes of whitish hermaphrodite flowers, and with entire valves, one being graniferous.

Variety.] Round-leaved Alpine Patience Dock; commonly called Monk's Rhubarb.

This species and variety are natives of Italy and the Alps; are retained in our gardens both as medical plants, and to effect variety, also formerly for culinary uses; they shoot up into stalks annually in the spring, flower in May, and ripen seeds in autumn.

4. RUMEX *sanguineus*.

Bloody Dock.] Hath long downright roots, erect red-stalks, two or three feet high; heart-formed lanceolate leaves, having blood-red

veins, and many red spots; the stalks terminated by spikes of hermaphrodite flowers, and with entire valves, one being graniferous.

This is retained in many gardens for the sake of variety.

Woody Kind for the Green-house.

5. RUMEX *lunaria*.

Tree-like Rumex, commonly called Tree Sorrel.] Rises with a woody, tree-like, smooth stem, branching eight or ten feet high; garnished with roundish - heart - shaped leaves; the branches terminated by loose panicles of greenish hermaphrodite flowers, and with smooth valves.

This is an exotic from the Canary Islands, and is retained in our gardens to increase the variety in the green-house collection.

The above five species are principally all the sorts of *Rumex* commonly cultivated in the English gardens; the four herbaceous kinds are perennial in root, and annual in stalks, and hardy enough to succeed in any open situation, and the woody kind is durable both in root and stem, &c. and is tender, requiring shelter of a green-house in winter. They flower generally in June or July; the flowers are small and tripetalous, generally terminating the stalks and branches in spikes, but are not ornamental; and are succeeded by ripe seeds in autumn.

Their merit as garden plants is—all the herbaceous Sorrel kinds are eminent soup-herbs for culture in the kitchen-garden, as aforesaid: the *Rumex Patientia*, as a medical plant; also, together with the *Rumex sanguineus*, is often employed for variety in the pleasure-ground; and the *Tree Sorrel* being tender, must be potted and placed among the green-house exotics.

Propagation and Culture.

Most of the herbaceous culinary Sorrels are raised from seed, and by parting the roots.

By Seed.—The common Sorrel, and round-leaved kind, may be raised abundantly by seed in the spring; but the common Sorrel in particular is occasionally more generally raised by this method, as the other propagates exceedingly by its repent roots, &c. However, both sorts may be sown in March, in any bed or border, broad-cast, and rake them in evenly, they will soon come up; observing, if the plants rise too thick, thin them moderately; and after being a little advanced in growth in summer, plant out a quantity of the stoutest in moist weather, in some bed or border in rows, the common sort and varieties about eight or nine inches asunder, and the other a foot at least, giving proper waterings, and they will grow freely, and be fit to cut for use the same

summer and autumn, &c. and continue several years.

Observe however, of the common Sorrel in particular, that as seedling plants of one or two years old generally produce larger leaves than older plants, it may be eligible to raise a fresh supply of seedlings annually, or every other year.

By parting the roots.—All the sorts may be propagated by this method, but the Round-leaved French Sorrel in particular increases exceedingly by running at the root; and the Barren Sorrel, rarely producing seed, is propagated principally only by parting the roots. However, any of the sorts may be easily increased by this method, which may be effected either in autumn or spring, though I should rather prefer the spring season, about the beginning or middle of March: either slipping off a quantity of off-sets from the old plants as they stand, by assistance of a knife or spade; or take some of them wholly up, and divide them into several slips, planting them in rows a foot distance, and give directly a good watering; they will expeditiously take root, assume a free growth, and furnish plenty of leaves for use all summer and autumn, &c.

As to the culture of these plants, very little is required more than the necessary care of keeping them clean from weeds; and in summer, when they run to stalk, it is proper to cut them down close to encourage a more plentiful supply of large leaves from the bottom; likewise, when the leaves have become very rank, cut them down occasionally towards the latter part of summer, that the roots may send up a good supply of fresh leaves for autumn, and winter service.

The *Patientia* and Bloody Dock are also raised by seed, and the former likewise by roots.

By Seed.—In autumn, or early in spring, sow the seed in a bed of light earth, and rake it in; and when the plants are come up three inches high, thin out a quantity, and plant them either in nursery-rows a foot distance, or at once where they are to remain.

By Roots.—The *Patientia* Dock, and variety, increase by off-sets from the root, which being slipped in autumn, and the slips directly planted, they will readily grow.

And the *Rumex lunaria*, or *Tree Sorrel*, is propagated easily by cuttings of the young shoots in spring and summer; if performed in spring, plant them in pots, and plunge them in a hot-bed, they will very soon emit roots; but in summer, they will succeed without aid of artificial heat, planted either in pots, or in a border of common earth, and occasionally

ally shaded and watered, many of them will strike and be well rooted by autumn.

RUSCUS, Butcher's Broom, and Alexandrian Laurel.

Consists of low shrubby and under-shrubby ever-greens, for the shrubbery and greenhouse collection; rising some three or four feet high, others scarcely a foot; garnished with smallish, oblong, and lanceolate leaves, some prickly, others smooth, from one to three inches long, and from half an inch to an inch broad, remaining all the year; and diœcious apetalous flowers, produced, in most sorts, on the surface and margin of the leaves, and in some at the ends of the branches.

Class and order, *Diœcia Syngenesia*.

Characters.] **CALYX**, diœcious, or male and female flowers, on two distinct plants; having spreading cups composed of six oval convex leaves.—**COROLLA**, no petals, but an oval erect nectarium, the size of the calyx, open at the mouth.—**STAMINA**, no filaments, but three united antheræ, in the males, sitting on the nectarium, and joining at the base. **PISTILLUM**, an oblong-oval germen, hid within the nectarium, a cylindric style, crowned by an obtuse stigma, standing above the mouth of the nectarium. **PERICARPIUM**, a round or globular trilocular berry, having two round seeds.

This genus consists of five species, three or four of which are hardy for any open plantations; and the others tender, requiring shelter of a greenhouse in winter.

Hardy Kinds.

Under this head is comprised the common Butcher's Broom—*Hypoglossum*, or Tongued Laurel—and Alexandrian, Laurel, &c. all of which are shrubby ever-greens, mostly of hardy growth for the shrubbery, &c. though the second, third, and fourth sorts, are also sometimes potted, to move under protection from severe frost; however, in a dry sheltered situation, they commonly stand out winter, in the open ground.—and the first sort is very hardy to stand all weathers.

1. *Ruscus aculeatus.*

Prickly Ruscus, Common Butcher's Broom, or Kne-Holly.] Hath a thick, fibrated, creeping, deeply-furking, white root; several erect, shrubby, tough, green stems, two or three feet high, closely garnished with small, oval, stiff, dark-green leaves, placed alternately, terminating in prickly points; and small, purplish flowers, situated on the upper surface of the leaves, succeeded in the female plants, by large red berries, ripening in winter.

This species grows abundantly in England, &c. in woods, and is introduced in many gar-

dens, in wilderness and shrubbery plantations, for variety.

Great quantities of the young bushy plants of this species are brought to London in winter, &c. for sale; they being collected in the neighbouring woods, by the herb people, taking them up with a little ball of earth about the roots, wrapping the ball up with moss, and in that manner hawk them about the streets; and the citizens buy them to plant in pots of sand, to adorn rooms, where they will remain green a long time. It is also in much request among the butchers, for scrubbing brooms; the branches being tied in tight bundles, forming a sort of broom, or besom; and with which they scrub and clean their chopping-blocks. Hence the name Butcher's Broom.

2. *Ruscus Hypophyllum.*

Under-leaf-flowering, Broad-leaved Ruscus, called Alexandrian Laurel.] Hath thick, knotty, long fibrated roots; many ligneous, pliable, tough, green stems, two or three feet high: oblong-oval, stiff, shining-green leaves, placed alternately, and bearing flowers on their under surface; succeeded, in the female plants, by small red berries, ripening in winter.

3. *Ruscus Hypoglossum.*

Under-tongue-flowering, long-leaved Ruscus, or Tongued-leaved Alexandrian Bay.] Hath thick fibry roots; many ligneous, slender, pliable, green stems, ten or twelve inches high; long spear-shaped leaves, each having a smaller leaf, like a tongue, issuing from its upper surface, and from the bottom of which are produced small yellowish flowers, succeeded by large red berries, ripening in winter.

It is a native of mountainous parts of Hungary and Italy.

4. *Ruscus racemosus.*

Racemose flowered Ruscus, or Alexandrian Bay.] Hath thick, long, fibry, whitish roots; many shrubby, smooth, very pliable, shining-green stems, four or five feet high, producing branches alternate ways; garnished with oblong-lanceolate, shining-green leaves; and yellowish hermaphrodite flowers, terminating the branches in racemous clusters, succeeded by large red berries, ripening in winter.

Variety.] With red flowers.

The above four hardy species grow freely in any of the shrubbery plantations; and multiply exceedingly by off-set suckers from the bottom.

The last three species, natives of Italy, Hungary, &c. having the name of Alexandrian Laurel or Bay, most of which being of a very pliant growth, and closely set with ever-green leaves, are supposed to be the plants used by the ancients in those parts, for composing

posing wreaths to crown their victors and eminent poets.

Tender Kind for the Green-house.

5. *Ruscus androgynus*.

Androgynous Canary Ruscus.] Rises with shrubby, pliant stems, five or six feet high, producing many side branches; garnished with oblong, stiff leaves; bearing small white flowers on their edges, succeeded by reddish berries.

All the above five species of *Ruscus* flower abundantly in June and July; four of which producing their flowers wholly upon the leaves, exhibit a curious singularity; and the *Ruscus androgynus* in particular, which having its flowers closely set all along the edges of the leaves, effect a singular and beautiful appearance; and the hardy sorts are often succeeded by ripe fruit in our gardens in winter.

All the hardy sorts are proper furniture for the verges of shrubberies, or any close plantations, as they thrive under the drip of trees, and will remain green the year round, and increase the variety of these compartments.

The tender sort requires shelter of a green-house in winter, so must be planted in pots and managed as other shrubby exotics of that department.

The propagation of all the sorts is very easy, as they increase very fast by the roots, which sending up numerous stalks or suckers, they may be taken up in autumn, winter, or spring, in open weather, and divided into many separate sets, each forming a proper plant; though they need not be divided too small, unless where a great increase is required, planting the largest at once where they are to remain, and the smallest in nursery-rows, &c. each plant will soon increase by off-sets, and assume a bushy growth.

They may also be raised from seeds, though not expeditiously, for the seed often remains in the ground till the second spring; sow that of the hardy sorts in any bed or border an inch deep; and the tender kind in pots, and placed under shelter, in cold weather; and when the plants are a year old, it is proper in March to prick them out, the hardy sorts in nursery-beds, for two or three years; and the tender sort in pots.

RUTA, Rue.

It consists principally of under-shrubby evergreens for the kitchen-garden and pleasure-ground; adorned with small decomposed and supra-decomposed, many lobed, and ternate leaves, and small tetrapetalous flowers, growing in bunches.

Class and order, *Decandria Monogynia*.

Characters.] CALYX is short, five-parted, and permanent. COROLLA, four oval spread-

ing petals. STAMINA, ten awl-shaped patent filaments, having short erect antheræ. PISTILLUM, a gibbous, cross-furrowed germen, having ten punctures, an erect style, and simple stigma. PERICARPium, a gibbous, five-lobed, quinquelocular capsule, opening in five parts at top, having many reniform, angular, rough seeds.

There are three species, one of which only, a shrubby perennial, is common to the English gardens, comprehending some varieties, valued both as medical plants, and sometimes to diversify the shrubbery; and the other two species are also eligible for the same occasion.

The species is,

1. *RUTA graveolens*.

(Rank-scented) or common Garden Rue.] Rises with a shrubby, very branchy stem, four or five feet high, forming a bushy head; closely garnished with decomposed, many-lobed, strong-scented, grey leaves; and the branches terminated by bunches of yellow flowers, having torn petals, and the lateral flowers quadrifid, succeeded by ripe seeds in autumn.

Varieties.] Common broad-leaved garden Rue—narrow-leaved Rue—variegated-leaved Rue.

They all flower in June, and ripen plenty of seed in autumn, particularly the common sorts.

2. *RUTA chalepensis*.

Aleppo Broad-leaved Rue.] Grows three or four feet high, garnished with supra-decomposed leaves, and hairy flowers.

Varieties.] Broad-leaved—narrow-leaved.

3. *RUTA patavina*.

Patavian three-leaved Rue.] Having ternate or threed, close-fitting leaves.

All these species and varieties are hardy enough to succeed in the open ground, though the two Aleppo Rues should have a sheltered situation, and dry soil; and it is advisable to pot some of those two sorts, to move to shelter of a frame, or green-house, in winter: the variegated kind should likewise have a dry, poor soil, otherwise is apt to become vigorous, and lose its variegations.

As to their uses in gardening, the common broad and narrow-leaved Rues are esteemed principally as domestic medicinal plants; their virtue as such, resides in the leaves; being occasionally used in a simple medical way in a family; and for which a few plants merit culture in every garden, allowing them generally a dry soil, and may be raised both by seed, and by slips or cuttings: and afterwards planted out either singly about the borders; or a few plants together in the herbary; or where large quantities

quantities are wanted, plant them in rows two feet asunder, and a foot and half in the lines; all the species and varieties may also be employed in the shrubbery compartments, in a dry situation, where they will effect an agreeable diversity, both in foliage and flowers.

The propagation of all the varieties is by seed, and by slips and cuttings.

By Seed.—The common Rue in particular may be raised plentifully, by seed in the open ground; sown in March or April, on a bed of light earth, and rake it in; they will soon come up, which, when two or three inches high, should be planted out in nursery rows, and watered till fresh rooted.

From the scattered or self-sown seeds of the

common Rue, many young plants often rise in autumn and spring.

By Slips or Cuttings.—This is the most expeditious method of propagation for all the sorts; for every slip or cutting of the young wood will readily grow; and is the only method of propagation, by which we can continue the different varieties distinct; therefore in spring, any time in March or April, slip or cut off a quantity of the young shoots, six or eight inches long, and plant them in a shady border, in rows half a foot asunder, giving a good watering, and repeat it occasionally, they will soon emit roots below, and shoots at top, so as to form little bushy plants by autumn.

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SACCHARUM, Sugar-cane, or Sacchariferous Reed.

The plants of this genus are tall growing tender perennials, of the arundinaceous tribe, natives of the Indies, and retained here in our stoves for variety; one of which is a most valuable plant, in its native soil, as from the juice of its stalks is prepared the various sorts of sugar; they rising with erect, strong, juicy stems, eight or ten feet high, adorned with very long leaves, and terminated by large panicles, and spikes of numerous bivalvous flowers.

Class and order, *Triandria Digynia*.

Characters.] **CALYX**, none; but a woolly down incloses each flower. **COROLLA**, is bivalve; having two oblong-lanceolate, acuminate, concave valves. **STAMINA** three capillary filaments, as long as the valves, and oblongish antheræ. **PISTILLUM**, a subulate germen, two cirrhose styles, and simple stigmas. **PERICARPIUM**, none; one narrow sharp-pointed seed to each floret, invested by the valves.

The species are,

1. **SACCHARUM officinarum**.

Common Sugar Cane.] Hath a long thick-jointed, fibrated, succulent root; sending up several upright, round, jointed stems, from six or eight to ten feet high, or more; abounding with a pithy saccharine juice; having at

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each joint large oblong leaves, three or four feet long, the base embracing the stalk a considerable way up; and the stalks terminated by very large panicles of numerous small flowers.

This species is the true Sacchariferous Cane, from which the sugary juice is expressed, which being boiled and refined, becomes that well-known useful substance called Sugar.

2. **SACCHARUM spicatum**.

Spiked Sugar Cane.] Hath a thick-jointed fibrated root; upright jointed stems, six or eight feet high; oblong, waved leaves, two or three feet long; and the stalks terminated by spikes of purplish flowers.

Both these species are perennial in root; the stalks rise several from each root; and in their growth resemble the *arundo*, or common reed of the marshes, but considerably larger, and instead of being hollow like those plants, are filled with a whitish pith, containing the sweet juice, or liquid, which renders these plants so very valuable; the stems are strong, but brittle, generally growing to perfection in from six or eight to twelve or fourteen months, becoming of a pale-yellowish colour; producing at top numerous small flowers, collected into very large panicles, &c. sometimes two or three feet long, each flower having only two small valves for the corolla; and is wrapped up in long down; succeeded by.

by oblong, narrow seeds included in the valves.

But it is the first sort, *Saccharum officinarum*, that is cultivated for sugar, and for which purpose prodigious quantities are raised in the West-Indies, and other hot countries; being propagated by suckers and cuttings, planting them in fields, in rows four or five feet asunder, which soon shoot up into stalks, becoming fit to cut for use sometimes in six or eight months, being then taken to a mill and squeezed between iron-cased rollers, to express the juice, which is then properly boiled and refined to form it into a due consistence to become Sugar.

From the skimmings of the Sugar in the different boilings, and melasses, being the last drainings of the Sugar, mixing therewith a quantity of water, and the whole fermented, is extracted that spirituous liquor called rum, abounding with a saluterous oiliness, whence proceeds the excellence of that spirit, compared with brandy.

In this country however, this valuable plant cannot be cultivated without the aid of a hot-house all the year; so that only a few plants are raised by way of curiosity, being planted in pots of rich earth, and placed in the stove.

Method of Propagation, &c.

Their propagation is effected abundantly by slips or suckers from the root, and by cuttings of the main stalks.

In this country, however, they are more generally propagated by slips from the bottom; or any side-shoots arising from the stems near the root, having earth raised about the bottom part, will soon emit fibres, and be fit for separation; observing, these slips or off-sets may be taken off at any season, in which they appear fit for the purpose, being careful to detach them with some fibres to each, and plant them separately in pots of rich earth, and plunged in the bark-bed, watered, and occasionally shaded till they have got root; retaining them always in the bark-bed in the stove; and managed as other exotics of that repository.

But in the West-Indies, &c. these plants are most commonly propagated by cuttings of the tops of the old canes, or any part thereof, divided into lengths of from twelve to eighteen inches long, and placed horizontally in the ground three or four inches deep.

SALIX, Sallow, or Willow-tree.

The Sallow and Willow are principally of the tree kind of the deciduous tribe; mostly of the aquatic nature, delighting in moist situations, but will grow any where; valuable

both as timber trees for various light uses, and in underwood plantations, for all sorts of basket-work, poles, &c. some sorts also to diversify garden plantations, there being many species, of different degrees of growth, from twenty to thirty or forty feet high, or more, garnished with oval, spear-shaped, and oblong leaves, in different trees, and dioecious apetalous flowers, disposed in amentums.

Class and order, *Dioecia Diandria*.

Characters.] **CALYX**, male and female flowers on separate plants, disposed in oblong, scaly, imbricated katkins or amentums, each scale containing one floret. **COROLLA**, no petals, but cylindric nectareous glands in the centre. **STAMINA**, in the males, generally two filaments, crowned with didymous quadrilocular antheræ. **PISTILLUM**, in the females, an oval narrow germen, a scarcely distinguishable style, having two erect bifid stigmas. **PERICARPIUM**, an oval-subulate, unilocular, bivalved capsule, having many small seeds crowned with down.

There are above forty different species of this genus, mostly of the tree kind, deciduous and of hardy growth, and some low under-shrubby and herbaceous-like plants; but the tree kinds only merit consideration for general culture, several of which grow to timber-trees; others are of great value to the basket-makers, being planted in marshy grounds, kept to low stools to produce a crop of shoots or twigs to cut annually, for all kinds of wicker-work; and others planted in similar situations being suffered to grow larger, to cut every three, or five, or six years for poles, useful for various purposes: and for garden culture, some particular sorts may be introduced thinly in large plantations for variety; and some sorts of the other kinds should be planted in some moist place, to furnish twigs for tying various garden articles.

The principal tree kinds in England are,

1. **SALIX caprea**.

Common Sallow Tree.] Grows but to a moderate height, having smooth, dark-green, brittle branches; oval, waved, rough leaves, indented at top, and woolly underneath.

Varieties.] Oblong, acute-pointed-leaved—silver-striped-leaved.

It grows abundantly in this country, but more frequently in dry than moist situations; is of a brittle nature, so is unfit for the basket-makers; but will serve for poles, stakes, and to lop for fire-wood, and its timber is good for many purposes.

2. **SALIX alba**.

White, or silvery-leaved Willow.] Grows to a great height, and considerable bulk, having

ing smooth pale green shoots; long, spear-shaped, acuminate, sawed, silvery-white leaves, being downy on both sides, with glands below the ferratures.

This is the common White Willow, which grows abundantly about towns and villages, and by the sides of rivers and brooks, &c.

3. *SALIX vitellina*.

Yellow, or Golden Willow.] Grows but to a moderate height, having yellow, very pliant shoots, oval, acute, ferrated, very smooth leaves, with the ferratures cartilaginous, and with callous punctures on the foot-stalks.

4. *SALIX purpurea*.

Purple Norfolk, or Red Willow.] Grows to a large height, having long, reddish, very pliant shoots, and long, spear-shaped, ferrated, smooth leaves, the lower ones being opposite.

5. *SALIX viminalis*.

Osier Willow.] Grows but a moderate height, having slender rod-like branches, very long, pliant, greenish shoots, and very long, narrow, spear-shaped, acute, almost entire leaves, hoary and silky underneath.

6. *SALIX amygdalina*.

Almond-leaved Willow.] Grows to a middling height, with long, flexible, light-green branches and shoots; spear-shaped, ferrated, smooth, shining-green leaves, on short foot-stalks, having trapeza-shaped stipulæ.

7. *SALIX pentandria*.

Pentandrous, Broad-leaved, Sweet-scented Willow.] Grows to some considerable stature, having brownish-green branches; oblong, broad, ferrated, smooth, sweet-scented leaves, shining above; and pentandrous flowers.

8. *SALIX triandria*.

Triandrous Willow.] Grows to a large stature, having numerous, erect, greyish-green branches, and pliant shoots; oblong, acute-pointed, ferrated, smooth, shining-green leaves, eared at the base; and triandrous flowers.

9. *SALIX fragilis*.

Fragile, or Crack Willow.] Rises to a middling stature, with brownish, very fragile, or brittle branches, long, oval-lanceolate, sawed, smooth leaves of a shining-green on both sides, having dentated-glandular footstalks.

This sort in particular being exceedingly fragile, so that it easily cracks and breaks, is unfit for culture in other grounds.

10. *SALIX hastata*.

Hastated-leaved Willow.] Grows to a middling size, with long, green, pliant shoots; sub-oval, acute, ferrated, smooth, close-fitting leaves, having heart-shaped stipulæ.

11. *SALIX Helix*.

Dwarf Yellow Willow.] Grows but to a very moderate stature, having a yellow, rough-barked trunk, with brownish branches; and

narrow, lanceolate, ferrated, smooth, blueish-green leaves, the upper ones obliquely opposite.

12. *SALIX Babylonica*.

Babylonian pendulous Salix, commonly called Weeping Willow.] Grows to a largish size, having numerous, long, slender, flexible, pendulous branches, hanging down loosely all around in a curious manner, and long, narrow, spear-shaped, ferrated, smooth leaves.

This curious Willow is a native of the East, and is retained in our hardy plantations for ornament, and exhibits a most agreeable variety; particularly when disposed singly by the verges of any piece of water, or in spacious openings of grass ground.

Other principal Willows, distinguished by the following Names.—Sound-growing Norfolk Willow—Upland red Willow—Broad-leaved Flanders Willow—Swallow-tail Willow—Dutch Osier—Wire Osier, &c. with some other varieties, particularly of the Osier kinds, found principally in the osier-grounds for the basket-makers, distinguished by different names, in different places.

The mode of flowering of all the sorts of Willows is, in amentums, or katkins from the sides of the branches, being male and female in different katkins on separate trees; ripening in March and April.

All the above species and varieties of *Salix* are of the tree kind, very hardy, and remarkably fast growers, and several of them attain a considerable stature, when permitted to run up to standards, which frequently grow forty or fifty feet high, in twenty or thirty years, having proportionably large trunks; though some sorts are apt to decay on the sides, when large, and others will remain sound to a considerable age and bulk: but all the sorts may be easily raised from cuttings, both as standards for timber; or kept down to underwood, and dwarf stocks for producing rods and twigs; or formed into pollards, or half-standards for loppings.

Most of the sorts grow naturally in England, &c. in great abundance, except the Triandrous and Hastated Willows, which grow chiefly in Switzerland; and the Weeping Willow is a native of the East; but are all hardy enough to grow any where.

They are mostly of the aquatic tribe, as being generally the most abundant, and of most prosperous growth in watery or moist situations; they however will grow freely almost any where, in any common soil and exposure; but grow considerably the fastest and strongest in low moist land, particularly marshy situations, by the verges of rivers, brooks, and other waters; likewise along the sides of wa-

tery ditches, &c. which places often lying waste, may be employed to good advantage, in plantations of willows, for different purposes.—Some for standards to grow to timber, some to form Osier beds, and kept down to stools, a foot high, to furnish an annual cutting of rods or twigs, for the basket-makers; which, being cut every year, pay well for the ground and trouble; others disposed in under-wood plantations to furnish poles, for cutting every three, four, five, or six years, for various uses; and some planted also for pollards, forming stems, eight or nine feet high; which, branching out numerously above, at that height, furnish a lopping every four, five, or six years, both for poles, and for faggot wood to burn. For all of which purposes they may be raised expeditiously by cuttings either of the young shoots, one or two feet long, or large truncheons or poles, of from three or four to eight or ten feet in length, especially if planted in moist places; for the cuttings of these trees are remarkably free of growth, so as sometimes, when any are occasionally used for common hedge-stakes, they strike root freely and grow up to large trees.

For ornamental purposes in gardening, may introduce any of the sorts in large, hardy plantations for variety, as aforesaid; but more particularly the white Willow, yellow Willow, purple Willow, pentandrous sweet Willow, almond-leaved, and weeping Willow, being disposed thinly in large out-plantations, will effect an agreeable diversity: but the Babylonian, or weeping Willow, for its curious pendulous growth, demands culture in every pleasure garden of any tolerable extent; and which, for the general part, should be disposed singly or detached, both, by the side of water, and in spacious opens of grass ground; also near grottoes, cascades, caves, ruins, &c. in all of which, it will effect a most agreeable variety, with its numerous, slender, pendulous branches, bending arch-ways all around, terminated by very numerous, long, slender, flexible, hanging shoots; likewise plantations of all the sorts of Willow in assemblage with poplars, birch, and other aquatic trees, may be formed in any low, swampy, spongy, or watery situation, where other trees will not thrive, and they will diversify, and ornament the premises, or some to cut occasionally for profit, in smaller or larger growth, as may be required.

Likewise for garden-culture, should introduce some of the best Osier kinds, which are of great use for tying and binding particular articles; such as for tying the branches of espalier trees to the treillage; likewise in the

nurseries for binding bundles of trees for sending to a distance; and in the market-gardens for binding their ware in bunches for market, such as celery, turneps, cole-worts, leeks, horse-radish, &c. as practised by the London gardeners; also for tying up the leaves of early cabbages, &c. to facilitate their cabbaging and whitening in the heart; they are likewise useful for making and mending garden baskets occasionally; therefore it is proper, for all of those purposes, to plant a quantity of cuttings, of the best Osier kinds, in some moist situation, near water if possible, keeping them low, and they will furnish a crop of twigs annually; a quantity of which being cut in winter, and tied in bundles, may be preserved for use all the year, which, when become dry, they being thrown into water will supple them for use.

Method of Propagation and Culture.

All the sorts of Willows are propagated expeditiously by cuttings both of the young shoots of one or two years old, in lengths of half a yard or two or three feet; and those of several years growth in truncheons or poles, of from three or four, to eight or ten feet long, according to the purposes for which they are designed, as mentioned below; all of which will most readily strike root, especially in low moist soils: and the season for planting them is any time in open weather, from October until February; though February and March is a very eligible season: having generally a long iron-shod dibble for planting the smaller cuttings, and an iron crow for making holes for the larger sets, or make holes with a spade for very large long pole-cuttings; though some use no instrument in planting the smaller cuttings, but sharpen the ends of them, and thrust them into the ground, especially in soft land; but as this method is apt to force off the bark from the lower part of the cutting, it is therefore best to cut the bottom of each cutting even, and plant them with some instrument, as above.

They are planted for different purposes; as for timber trees—to form osier grounds—to cut for poles—pollards for lopping, &c. So the cuttings must be prepared and planted according as directed below, under their respective heads.

For timber trees.—The timber of Willows is esteemed for several purposes, it being very white, of a fine grain, smooth, and takes a good polish, which renders it proper for many light articles: and, to raise them for timber chuse the larger growing sorts, such as the white, yellow, and purple, or red willows, &c. taking cuttings of the strong young shoots,

shoots, which may be planted at once where they are to remain, in any low marshy situation, where they will grow amazingly fast.

Having, however, prepared the ground, by proper digging, or ploughing, as may be most convenient, and the situation admits; then provide a quantity of cuttings of strong young shoots, of one or two years growth, cut to half a yard, or two feet lengths, which plant in rows, only six feet asunder, and three or four distant in the rows, that they may draw each other up fast in growth, and allow for a gradual thinning, inserting each cutting two parts of three into the ground, by the method before observed; they will soon emit roots, and shoot strongly at top in spring and summer, observing that to have them run up with clean stems for full standards, clear all away but one of the strongest leading shoots for a stem, which suffer to run up always at full length in its future growth; remarking that in a few years, when the trees approach one another, they should be thinned, which thinnings will serve for poles for several uses, repeating the work of thinning in a few years more, according as the branches of the different trees interfere, leaving them at last about twelve or fifteen feet asunder, to attain full growth: thus they will draw each other up very expeditiously with straight handsome stems, forty or fifty feet high or more; and in twenty or thirty years, will be fit to fell for timber.

For Osier Grounds.—Osier grounds are plantations of osier Willows, in low stools, for producing twigs annually for the basket makers, being formed in any low, swampy, marshy or watery situation, planted with cuttings of the best osiers, and other most pliant sorts of Willows, in rows two or three feet asunder, and always kept to low stools a foot high, in order to force out a more plentiful annual crop of twigs and rods, proper for use in one summer's growth, of from three or four, to six or eight feet long, of a pliant tough nature, fit for working into all kinds of basket and wicker-work, which being cut annually in winter or spring, are worth from five or six, to eight or ten pounds an acre per annum: so that, osier plantations being thus formed in any low, watery, waste land, incapable of yielding other produce to perfection, will turn out to great advantage; and, if near any navigable river, for the convenience of water carriage, it will still be more advantageous: on which consideration, very large tracts of waste, boggy grounds and islands, along the river of Thames, are employed in osier grounds, for the London consumption.

Therefore, making choice of any convenient, low, moist situation, let it be dug or ploughed, for the reception of the osiers: then, in the proper season before-mentioned, gather a sufficient quantity of osier sets of different sorts, which must be cuttings of the one or two years old shoots, cut into two feet, or two feet and half lengths; these being provided, then draw lines for planting them, two feet and half distance, inserting each cutting ten or twelve to fifteen inches into the ground, leaving the rest out to form the stool, and let them be two feet and half distance in each row: having thus formed the plantation, the cuttings will root firmly in the spring, and shoot at top tolerably strong in summer, each stool generally throwing out several shoots, of an erect growth; observing, during this first summer, to keep down all large weeds, that the stools may have full scope to produce the first shoots as strong as possible, which, by the end of autumn, will probably be advanced some considerable length; and if much wanted, may be cut in the following winter or spring; though, for a full plantation, they should generally be suffered to continue their growth for two years, till the stools are firmly rooted and become strong; then cut down all the tops close to the head of the stools; they will serve for poles, &c. next year the stools will shoot out strong, a numerous crop of twigs and rods, fit for cutting for the basket-makers in winter following; and, the stools still remaining, furnish an annual crop, fit for cutting every winter, which should be cut down always to the head of the stool, as just above observed; sorting the twigs in sizes, tie them in bundles, and stack them up for use.

To cut for Poles.—Willow poles are useful for various husbandry purposes; such as for handles for implements, and for making hurdles, &c. and plantations of stools may be made in any waste, watery places, or along the sides of brooks, rivers, watery ditches, and other similar situations, as before observed, to cut every three, or four, or five, or six years, according to the purposes for which they may be required.

For this purpose, procure a quantity of sets, of two year old shoots, in cuttings about two feet and half long; plant them in rows, a yard asunder, introducing each cutting two parts of three into the ground; they will all readily grow, and each send out several erect shoots, which, in three or four years, will become large poles fit to cut for use.

Or large cuttings or truncheons, three or four feet long, thrust down along the sides of
6 K 2 rivers,

rivers, brooks, ditches, &c. they will take root, and shoot out strongly at top for poles, as above.

To form pollard Standards.—Willow pollards are common almost every where, they being raised commonly from large sets or cuttings of poles, three yards long, or more, planted along the sides of rivulets or watery ditches, &c. and that being generally topped or divested of the leading shoot, they do not run up with tall stems, but branch out all around, at seven or eight feet height, into many erect branches, which, in four, five, or six years, being lopped down to the head of the stem, serve for poles, for hurdles, &c. also for fuel, as before observed; and the pollards shooting out again, they in this manner furnish a lopping every fifth, sixth, or seventh year, and thereby prove very profitable for many purposes.

The sets or cuttings for raising these pollards may be obtained in plenty from the loppings of any old pollard Willows, &c. choosing the large straight poles, cut about seven or eight to nine or ten feet lengths, according as they may occur, which must be planted either with an iron crow, or some similar implement, driven into the ground to make wide holes, two feet or two and a half deep, for their reception; or, if the ground is impliant and stubborn, must dig holes with a spade that depth, planting one set in each hole, placing them a foot and half at least, to two feet and half in the ground, leaving six, seven or eight above for a stem: thus, these sets, though to large and long, if planted in moist places, will readily strike root, and shoot out at top the following spring and summer, into many erect branches, which, after four or five years' growth, become fit to lop for poles, &c. and the trees will thus continue to afford a lopping every fifth, sixth, or seventh year; or may grow larger, according to the purposes for which the loppings may be wanted.

To form Hedges.—Sometimes Willow hedges are raised in some outward place, along ditch sides, or elsewhere, when designed to form either a fence, blind, or shelter expeditiously; which is easily effected by cuttings, either of strong young shoots, cut into two or three feet lengths, and planted in a row half a foot asunder, and twelve to fifteen or eighteen inches deep; or with larger trunchcons of several years' growth, cut into sets, two, three, four, or five feet long or more; and in either case, that when the sets have made, the first years shoot, the shoots may be plashed together in winter, both to stiffen the hedge and give it a thicker form: afterwards

it may be kept regular by clipping it annually, or may be suffered to take its own natural growth, as occasion shall require.

Observe, however, that to form a Willow hedge, as soon as possible, you may use large straight sets, of five or six feet long, and plant them chequer-ways, placing each set half a yard in the ground, leaving three or four feet above; which, being arranged cross one another in the above-mentioned chequer manner, and ranged all an equal height, they will at once form a good firm fence, immediately fencible against cattle.

Or, where a speedy fence is wanted, by way of blind or shelter, may procure a quantity of loppings, five, six, or seven feet long, well furnished with lateral branches to the bottom, and planted in a deepish trench, pretty close together, they will grow and form a sort of fence directly.

To furnish Twigs for Garden Use.—Osier twigs being useful in many gardens for various tyings, as we before observed, it is eligible to cultivate a few of the best osiers in most gardens, to furnish a supply for the different purposes; choosing some moist situation, or near any watery ditch, or other water in any by place, or where most convenient: and, having procured a quantity of the most pliant kind of Osier sets, cuttings of young shoots, half a yard or two feet long, which plant in the place allotted in rows, planting or thrusting them two parts of three into the ground; they will grow freely, and furnish plenty of twigs every year. managing them as observed for those of the *Osier Ground*.

As to the culture of all the above different plantations of Willows, they require but little; which is principally the keeping down large weeds the first and second year after planting, which is more particularly requisite in the plantations of young low cuttings, till they are a little advanced in growth.

For Nursery Collections.—Collections of the different sorts of Willows should also be kept in all nursery grounds, both public nurseries for sale, and in private nurseries, to supply plantations occasionally, raising them generally from young cuttings, of a year or two old, in half yard or two feet lengths, and planted in rows, two or three feet asunder, to grow till wanted.

SALLAD HERBS.

Various sorts of esculent herbs of different genera are used for sallading, which by different sowings, plantings, &c. are obtained at all times of the year; but the most generally esteemed sorts may be comprised under the following three heads—*Large Principal Sallad*

Sallad Herbs—Small Sallad Herbs.—Occasional Sallad Herbs.

Large Principal Sallad Herbs.—These consist chiefly of three principal sorts, viz. lettuce, all the varieties estimable as the most generally useful of the large sallad plants,—endive, all the different sorts—and celery, all the varieties—which three principal sorts are all raised from seed, by different sowings and transplantings, and are in best perfection for use when arrived to full growth: either of which may be eaten as a Sallad alone, or all of these sorts mixed together, or any, or all of them mixed with a proper quantity of small fallading, or other Sallad Herbs occasionally: but with small fallading in particular is very eligible in winter and spring; as the small fallading, being of a warm nature, renders the Sallad more grateful and wholesome. Lettuce is generally esteemed as the most material Sallad Herb, for general use, at most times of the year, but particularly in summer, when full grown and firmly cabbaged; but by several sowings and transplantations at different times, from January and February, until September or October, in different situations, according to the season, the plants may be obtained in tolerable plenty almost the year round, but always more finely cabbaged in summer than in winter. And as to the endive and celery, they are excellent for autumn and winter Sallads; they being in full perfection in September, October, and November, when they will be full grown and finely blanched, and they often continue in tolerable perfection all winter and spring.—But for other particulars, together with the method of culture of these three, principal Sallad Herbs, see their respective genera, *LACTUCA*, *CICHORIUM*, and *APIUM*.

Small Sallad Herbs.—The principal sorts, denominated Small Sallad Herbs, are cresses, mustard, radish, rape, and turnep, also lap-cabbage-lettuce: in all of which herbs, considered as small fallading, the young leaves are the useful part for that purpose and are always in best perfection when quite young, or only a few days, or a week or two old at most, especially the first five of these sorts, whilst in their first leaves; cutting them up, stalks and top together, close to the ground, as when they are thus quite young they eat exceeding tender, with an agreeably warm relish, for they being mostly of so warm a nature, that if suffered to grow old for fallading, they would eat very hot and disagreeably strong-tasted, but being used when quite young, as above; whilst they remain of a palatably warm relish, they are highly proper

to mix in all winter and spring Sallads in particular, though many people are fond of them, at most times of the year, and many often use them alone, particularly in winter and spring; they, however, are preferable when mixed with lettuce and the other large fallading.

All these small Sallad Herbs are raised from seed, which, for the purpose of fallading, are sown at all times of the year, when they are required, in the open ground in the spring and summer, and in winter under frames and glasses, and occasionally in hot-beds; and where a constant supply is wanted, a repetition of sowings is requisite every week, ten days, or a fortnight, being sown generally in shallow flat drills, each sort separate, very thick, and only just covered with earth. But for the particular culture of these herbs for fallading, see the article *SMALL Sallad Herbs*.

Occasional Sallad Herbs.—This head comprehends several other plants that may come under the denomination of Sallad Herbs, but not being so estimable for general use as the former sorts, are only used occasionally, viz. Corn Sallad, or lamb's lettuce—purslane—spear-mint—water-cress—borage and borage-flowers—nasturtium-flowers and young leaves—chervil—burnet; and sometimes red-cabbage—radishes—red beet-root—finochia, or Azorian fennel—sorrel—tarragon—young onions—cives—and sometimes horse-radish, incorporated with other herbs; most of which sorts are occasionally used both in composition with other Sallad Herbs, and some used alone as a Sallad, such as red-cabbage, water-cress, young borage, &c. they are mostly hardy plants raised in the full ground; and as each of which requires a particular mode of culture, we refer to their respective genera, where their peculiar uses as Sallad Herbs, &c. methods of propagation and culture, are fully explained.

SALSOLA, Glass-wort, and Stone-crop-tree.

This genus is composed of herbaceous annuals and perennials of but little merit as garden plants, and one shrubby ever-green, proper for the shrubbery.

Class and order, *Pentandria Digynia*.

Characters.] *CALYX*, five oval permanent leaves. *COROLLA*, no petals. *STAMINA*, five very short filaments inserted into the divisions of the calyx. *PISTILLUM*, a round germen, a double, or a tripartite style, and recurved stigma. *PERICARPIUM*, an oval unilocular capsule lodged in the calyx, having one large seed.

There are many herbaceous species, and some

some of shrubby growth; one of the latter being the only sort generally cultivated in the English gardens, viz.

SALSOLA fruticosa.

Shrubby Glass-wort, commonly called Stone-crop tree.] Rises with a shrubby erect stem, branching numerous and erectly, four or five feet high, closely garnished with very small obtuse fleshy leaves, like the common Stone-crop on the walls.

This species inhabits the sea-shores in England, France, and Spain, &c. but is retained in many curious gardens, in the ever-green collection, to adorn the shrubbery compartments, allowing it generally a sheltered situation.

The propagation of this ever-green is by suckers, layers, and cuttings; many stems generally rising from the root, which may be divided in autumn or winter, into so many separate plants; and layers or cuttings of the young branches in autumn or spring will be well rooted by autumn following.

SALVIA, Sage, Clary, &c.

It comprehends under-shrubby, herbaceous, and shrubby plants, both for the kitchen garden, pleasure-ground, and green-house, garnished mostly with spear-shaped, oval, and oblong leaves, and small, monopetalous, ringent flowers, generally terminating the branches in whorled spikes.

Class and order, *Diandria Monogynia.*

Characters.] *CALYX* is monophyllous, wide at the mouth, and bilabiate—*COROLLA* is monopetalous, tubulous below and ringent above, having the upper lip concave and indented, and the under one broad and trifid. *STAMINA*, two short filaments, split into two parts, one of which supports the antheræ. *PISTILLUM*, a quadrid germen, a long slender style, and bifid stigma. *PERICARPIUM*, none; four roundish seeds lodged in the calyx.

To this genus *Salvia*, is now joined *Sclarea*, or common Garden Clary, and *Horminum*, or Wild Clary, &c. amounting in the whole to above thirty species, though not half so many that merit culture, as garden plants, consisting of hardy under-shrubby, and herbaceous perennials for the open ground, and shrubby evergreens for the green-house.

Hardy under-shrubby kinds.

Under this head is comprehended the common Sage of the kitchen garden, having many varieties; all under-shrubby perennials, originally exotics from the southern parts of Europe, but are all hardy enough to succeed here in the open air, the year round.

1. *SALVIA officinalis.*

Common officinal Sage.] Rises with short,

under-shrubby, hairy stems, branching numerous from the bottom, two feet high, or more, forming a very bushy head; spear-shaped-oval, entire, slightly crenated, rough leaves, and the branches terminated by spikes of blueish flowers, having acute cups.

Varieties.] Common culinary red Sage, being of a black-red colour—green broad-leaved balsamic Sage—Broad-leaved, hoary, balsamic Sage, having generally the broadest leaves of all the sorts, standing on long foot-stalks—Wormwood Sage.—Narrow-leaved hoary Sage, commonly called Sage of Virtue, having the base of the leaves sometimes auriculated, or indented in form of ears, and sometimes not eared—Lavender-leaved Sage—Variegated green Sage—Variegated red Sage.

They all flower in June and July, and are sometimes succeeded by ripe seed in autumn.

This species and varieties are all very hardy plants, perennial in root, stem, and branches, and retain their leaves the year round. They are plants of sovereign virtue, as the name imports, and the leaves are the only useful part, being proper for various culinary purposes, and for medical uses; are also often used in the manner of tea, by way of medicine, and eaten with bread and butter, and used for making sage-cheese, &c. these plants, therefore, demand culture in every family-garden; and any, or all the sorts may be cultivated for use, they possessing nearly all the same quality; but the red Sage is the most commonly cultivated for general kitchen purposes; and the broad-leaved hoary Sage, and the Sage of Virtue, is often preferred for tea and other medical uses, though it is probable any of the sorts may be equally eligible, as being all varieties of one species.

Hardy herbaceous kinds.

There are many herbaceous species of *Salvia*, some of which formerly composed different genera, such as *Sclarea*, or Garden Clary, and *Horminum*, or Wild Clary, &c. mostly originally of foreign growth, but grow freely in our gardens in the open ground; though they possess no great merit, except one for culinary and medical use; and the others principally as plants of variety, and consist of biennials, perennials, and annuals, garnished mostly with broad rough leaves.

The most noted species are,

2. *SALVIA Sclarea. (Biennial).*

(Sclarea)—or common Garden Clary.] Hath a fibrated biennial root, crowned with broad-oblong, heart-formed, serrated, wrinkled, rough, hairy leaves; upright, thick stems, two or three feet high, branching oppositely, having all the branches terminated by large, loose, whorled

whorled spikes of pale blue flowers, attended by concave, acuminate, bracteal leaves longer than the corolla and calyx.

Varieties.] Broad-leaved—Long-leaved—Most wrinkled-leaved.

This species and varieties are biennials, have all large, thick, woolly leaves, that impart a strong disagreeable odour, and are the useful part of the plants, which are cultivated in kitchen gardens, for some domestic uses, and medicinally by infusion, and decoctions both inwardly and outwardly; the plants being raised from seed annually, and planted out a foot and half asunder, they spread out into large leaves for use, till next summer; when they shoot up into stalk for flower and seed, then totally perish.

3. *SALVIA verbenaca.* (*Perennial.*)

Common Wild Clary.] Hath a fibrated perennial root, oblong, sinuated, serrated, wrinkled leaves, and declinated stems, a foot long, terminated by whorled spikes of small blue flowers, having the corolla narrower than the calyx.

It grows wild in England, &c. its virtues are supposed nearly the same as the garden clary; and the seed being of a viscous nature, is sometimes used for clearing the eye from any moat that happens to fall into it, putting one of the seeds into one corner, and moving it about, the dust sticking thereto, removes it out of the eye.

4. *SALVIA indica.* (*Perennial.*)

Indian Clary with a variegated Flower.] Hath a fibrated perennial root, upright four-cornered stems, three or four feet high, heart-shaped, acutely crenated leaves, the upper ones sessile, and half the upper part of the stalks adorned with blue variegated flowers, in remote whorls.

5. *SALVIA glutinosa.* (*Perennial.*)

Glutinous yellow Clary.] Hath a strong, fibrated, perennial root; heart-shaped, sagittated, acutely serrated, glutinous leaves, upright four-cornered, glutinous stems, three or four feet high, terminated by spikes of yellow flowers, in close whorls.

6. *SALVIA Horminum.* (*Annual.*)

Galeated Horminum—or Purple-topped annual Clary.] Rises with upright stalks, a foot and half high, obtuse crenated leaves, and the stalks terminated by whorled spikes of small purplish flowers, with coloured bracteal leaves at top.

Varieties.] With purple tops—with red tops.

All these herbaceous species flower mostly in June, and the seeds ripen in Autumn.

They are all hardy enough to grow in any common soil, the first of which being for the

kitchen-garden, and the others to increase the variety of the herbaceous collection.

Tender shrubby kinds for the Green-house.

Consists of four or five shrubby ever-green plants of the Sage kinds, natives of different warm countries, and retained here in our green-house collections for variety.

7. *SALVIA mexicana.*

Shrubby Mexican Sage.] Rises with a shrubby branchy stem, eight or ten feet high; having four-cornered, purplish branches; oval leaves, pointed at both ends, and serrated; and close spikes of blue flowers at the ends of the branches.

8. *SALVIA africana.*

Shrubby African Sage.] Rises with a shrubby branching stem, four or five feet high; roundish serrated grey leaves, truncated and indented at the base; and whorled spikes of blue flowers towards the ends of the branches.

9. *SALVIA aurea.*

Golden African Sage.] Rises with a shrubby branching stem, six or seven feet high; roundish entire leaves, truncated and indented at the base; and short spikes of golden-coloured flowers at the ends of the branches.

10. *SALVIA pomifera.*

Pomiferous or Apple-bearing Sage of Crete.] Rises with a shrubby branchy stem, four or five feet high, spear-shaped-oval, entire, slightly crenated, hoary leaves, and spikes of blue flowers, having obtuse cups.

The branches of this sort have sometimes glandular protuberances as big as apples; hence the name Pomiferous Sage.

11. *SALVIA canariensis.*

Canary Sage.] Rises with a shrubby branching downy stem, garnished with hastated-triangular, obtuse, crenated leaves; and whorled spikes of blue flowers at the ends of the branches.

All the above species of *Salvia*, both hardy and tender kinds, are principally of the verticillate tribe, or such as produce their flowers in a verticillus, or whorls round the stalks, some having the whorls standing almost close, others placed remote (see *VERTICILLATUS* and *VERTICILLUS*); and the flowers are all monopetalous and ringent, generally small, but numerous in each spike. See the *Characters*, &c.

All the under-shrubby and shrubby kinds, both hardy and tender sorts, are durable in root, stem, and branches, and remain in leaf the year round.

But the herbaceous kinds are furnished with stems only in summer.

The *Salvia Officinalis*, or common Sage and varieties, considered as culinary and medicinal

dical plants, merit culture in every kitchen-garden, allowing them a moderately dry soil, and sunny situation, to enable them to stand the winter more effectually; for if planted in moist or shady places, they are liable to suffer by severe frosts: they are easily raised from slips, as hereafter directed, and afterwards planted in rows a foot and half asunder; in which they will grow large bushy plants, and remain several years, furnishing leaves plentifully the year round; which are proper for use, both fresh gathered from the plants, and when dried; though for culinary purposes, they are best when fresh gathered, either gathering the leaves distinct, or taking the small young side-shoots or tops and leaves together, slipping or cutting them off: and towards the latter end of summer, about July or August, gather a quantity to dry, both for culinary use in winter, and to use for sage tea in the same season, where required: being careful in all the gatherings not to stump them too close, particularly in autumn and winter.

But the varieties of the common Sage may also be employed to diversify the fronts of small shrubbery clumps, &c. particularly the variegated kinds.

As to the merit of the herbaceous kinds, the *Garden Clary* being a culinary and medical herb, must be stationed in the kitchen garden; and all the others, being considered principally as plants of variety, as aforesaid, may be employed to diversify any of the compartments of the pleasure ground; all of which herbaceous kinds are easily raised from seed; and the seedlings, when two or three inches high, should be planted out. See their *Propagation, &c.*

And as to the tender shrubby kinds, they requiring shelter from frost, must be kept always in pots, in order for moving to a greenhouse in winter; and as being elegant evergreens, they will effect an agreeable variety among the exotics of that conservatory.

Propagation and general Culture of the common Sage kinds.

The propagation of all the varieties of common Sage is effected plentifully by slips or cuttings of the young shoots from the sides of the branches;—also sometimes by bottom, rooted off-sets, &c. and may also be raised from seed.

By slips or cuttings.—The slips both of the former and same year's growth, planted in April or May, will readily grow. Slips of the former year's shoot may be obtained plentifully any time in spring, but should not be planted earlier than April; which however, if planted any time in April or early in May, they will

root freely, and form good plants against winter: but young slips, shoots of the same year, are rarely fit for slipping before the middle of May, or beginning of June: these however are exceedingly eligible, will most readily strike root in a short time, and assume a free growth; in either case, taking opportunity of moist weather, and having recourse to some good bushy plants, slip off a proper quantity of the outward, robust side shoots, about five, six, or seven inches long; trim off all the lower leaves, then in some shady border proceed to plant them with a dibble in rows, half a foot asunder, planting them down almost to their tops; giving water directly, to settle the earth close, as well as to promote an early emission of fibres, repeating the waterings occasionally in dry weather; and the slips will soon emit fibres, and shoot freely at top: observing, if they should spindle up with slender shoots, or run up to flower, it is proper to top them short, in order to force out laterals below, to assume a bushy growth: thus they will form tolerable bushy plants by August or September; when, or in spring following, they may be removed, with balls of earth about their roots, and planted where they are finally to remain, either in four feet beds, or in continued rows, a foot and half asunder, if designed as a close plantation for use: and those designed for the pleasure ground should be disposed accordingly.

By rooted off-sets.—Sometimes Sage, as before observed, having grown into large bushy plants, with numerous branches rising near the ground, which touching the earth, have formed plenty of fibres at bottom; and that being slipped off separately with the fibres thereto, each immediately commences a proper rooted plant; they may either be slipped off as the plants stand in the ground, or the bunches of plants may be taken up and divided into as many separate slips as are furnished with roots: and as they thus directly form rooted plants, they may be planted at once where they are to remain.

However, those raised from young slips generally form the strongest bushy plants in the end.

By Seed.—The raising these plants from seed is hardly worth practising, since they may be propagated so easily by slips or cuttings. However, the season for sowing the seed, is any time in April, in a bed of light rich earth; sow it evenly, and rake it in; the plants will soon come up: and when about two or three inches high, prick out the strongest in nursery rows, half a foot asunder, to gain strength till September or spring following;

lowing; then transplanted with balls, where they are always to stand.

As to the culture of this species of Sage and varieties, all that is required is the keeping them clean from weeds in summer, cutting down the decayed flower-stalks in autumn, and slightly digging between the rows in the same season, to remain clean and decent during the winter, &c. and is also beneficial to the plants, so as if not done in autumn, it should not be omitted in the spring; and generally observing in gathering the Sage for use, it should be done with some care and regularity, not to cut the tops too close, to render the plants naked and stubby, especially late in autumn and winter; in which they would be more liable to suffer from severe frost than when the head is preserved somewhat full and regular; and in this state the plants will continue longer in a prosperous free growth accordingly, of several years' duration.

Likewise observing, that when in any old plantation, naked, stubby, or decayed parts casually occur, cut them out accordingly, and reduce to order any straggling irregular growth; which occasionally pruning being performed in spring or summer, the plants will more readily emit fresh shoots and form full heads.

Also observe, that when the general plants of any old plantation of Sage, of some considerable standing, appear to assume a declined state, not productive of plenty of young leafy shoots, &c. should, in proper time, propagate a fresh supply from slips or cuttings, as above, ready to succeed the said old plantation.

Or in continuing plantations of Sage, if the ground appears much impoverished, a little dry rotten dung pointed in lightly will add vigour to the plants.

Propagation, &c. of the herbaceous kinds.

All the herbaceous kinds of *Salvia* are easily raised from seed, sown in spring in the open ground; and the perennial sorts also by parting the roots.

By Seed.—The Garden Clary, being a biennial, must be raised every year from seed. Sow it in March, in any bed or border of common earth, and rake it in; and when the plants have got leaves of two or three inches growth, plant them out in showery weather, in rows eighteen inches distance, and the same distance in the rows; they will soon get root, and grow large, and furnish large leaves, fit for use in autumn, winter, and the following spring.

The perennial sorts are also raised from seed, sown in a bed of light earth in March, and raked in, and the seedlings planted out in

summer, in nursery-rows till autumn, then transplanted into the borders, &c.

And the annual sorts may be sown in spring, about the borders, in patches to remain.

By Parting the Roots.—The perennial kinds only can be increased by this method, which may be performed in autumn, or early in the spring.

Propagation, &c. of the tender shrubby kinds.

All the five tender shrubby kinds for the green-house are easily propagated by cuttings of the young shoots in spring and summer. If in spring, a quantity of cuttings planted in pots, and plunged in a hot-bed, will very soon emit roots at bottom, and shoots at top, when they should be gradually hardened to the full air. But cuttings planted in summer will often strike without the aid of a hot-bed, planted either in pots, or in a bed of natural earth, under frames and lights, or covered close with hand-glasses, shaded from the mid-day sun, and occasionally watered.

The plants must afterwards be potted off separately, and managed as other shrubby exotics of the green-house. See GREEN-HOUSE PLANTS.

SAMBUCUS, Elder-tree.

This genus consists of hardy deciduous trees and shrubs, and herbaceous perennials, of the berry-bearing tribe, proper for some useful purposes in gardening, and for diversifying hardy plantations; also in their production for some domestic uses: their buds, leaves, and flowers for medicinal occasions, and their berries, in some sorts, valuable for making elder wine; are mostly of strong, but not very lofty growth, producing large, long shoots, full of a fungous pith, and are all garnished with large winged leaves and numerous small rotaceous flowers, mostly in cymose umbels towards the ends of the branches, succeeded by large bunches of black and other coloured berries in autumn.

Class and order, *Pentandria Trigynia*.

Characters.] CALYX is small, monophyllous, five-parted, and permanent. COROLLA is monopetalous, rotated and concave, and cut into five obtuse reflexed segments. STAMINA, five awl-shaped filaments, having roundish antheræ. PISTILLUM, an oval germen under the corolla: no style, but instead thereof, a swelling glandule and three obtuse stigmas. PERICARPIUM, a roundish unilocular berry including three angular seeds.

There are about four species in this genus, retained in our garden plantations, three of which are of the tree and shrub kind, and one is an herbaceous perennial: two of them are common in England, &c. namely, the Com-

mon Black Elder-tree, and the Herbaceous Dwarf Elder; the other two are foreigners, one being from the south of Europe, and the other of America; but are all hardy enough to grow here in any situation.

Tree and shrub kinds.

1. *SAMBUCUS nigra.*

Black-berried, or Common Elder-tree.] Rises with a tree-like stem, branching out numerous into a large spreading head, twenty feet high; pinnated leaves, of two or three pair of oval lobes and an odd one; and large, cymose, five-parted umbels of white flowers towards the ends of the branches, succeeded by large bunches of black, and other different coloured berries, in the varieties.

Varieties.] Common Black-berried Elder-tree.—White-berried Elder.—Green-berried Elder.—Lacinated or Parsley-leaved Elder, having the folioles much lacinated, so as to resemble parsley-leaves.—Gold-striped-leaved Elder.—Silver-striped Elder.—Silver-dusted Elder.

All these being varieties of *Sambucus nigra*, mostly of a tree-like growth, and have, for the general part, five or seven-lobed leaves, and quinquepartite umbels of flowers and fruit; the common Black-berried Elder, however, is the most generally known variety, and the most commonly cultivated: sometimes as standards in plantations of other common hardy trees, but more frequently in forming outward hedges expeditiously, as being a very fast grower; likewise often in detached standards in orchards and in hedge rows, &c. for the sake of their berries for making of Elder-wine; and all the varieties may also be employed for diversifying plantations: all the varieties make very strong shoots, full of a white pithy substance, but becomes woody as they advance in age, and the old wood becomes solid and very hard, fit for many purposes: all of which varieties will grow in any situation, and may be raised very expeditiously by cuttings of the year-old shoots. See the *Propagation*.

The bark, buds, leaves, and flowers are used in medicine, being sovereign in many disorders.

And the ripe berries make an excellent cordial wine.

2. *SAMBUCUS racemosa.*

Racemous-flowering, Red-berried Elder.] Rises with a tree-like stem, branching ten or twelve feet high, having reddish-brown branches and buds; pinnated leaves of six or seven oval deeply-sawed lobes, and compound, oval, racemous clusters of whitish-green flowers, succeeded by oval clusters of red berries.

This is a resident of the mountainous parts

of the south of Europe, and is retained in our gardens as a flowering shrub, having a peculiar singularity in its oval-clustered flowers and berries.

3. *SAMBUCUS canadensis.*

Canada Shrubby Elder.] Rises with a shrubby stem, branching eight or ten feet high, having reddish shoots; somewhat bipinnated leaves, often ternate below, composed of five, seven, or nine oval lobes; and towards the ends of the branches, cymose, quinquepartite umbels of flowers, succeeded by blackish red berries.

Herbaceous kinds.

4. *SAMBUCUS Ebulus.*

Herbaceous Elder, commonly called Dwarf Elder.] Hath a thick, creeping, tough, perennial root, spreading widely around; herbaceous, strong, pithy, green stems three or four feet high; large pinnated leaves, of from three or four to six or seven pair of long, acute-pointed, indented lobes, with leafy stipulæ, and large, cymose, three-parted umbels of white flowers, succeeded by black berries in autumn.

This is a perennial, and grows wild in England in hedges, banks, and fields, but is admitted in some gardens for variety and medical uses.

Variety.] Lacinated-leaved, having the folioles beautifully jagged into segments.

All the sorts of Elder are of the deciduous tribe, very hardy, and grow freely any where; are generally free shooters, but particularly the *Common Elder* and varieties, which make remarkably strong, jointed shoots, of several feet length, in one season; and they flower mostly in summer, except the *Racemose Elder*, which generally begins flowering in April; their modes of flowering being in cymose umbels, and racemose clusters, as in their respective descriptions; rising generally towards the termination of the preceding year's shoot, each bunch consisting of numerous small, wheel-shaped, concave, semi-quinquefid flowers; and the bunches being large, spreading, and very abundant, are exceeding conspicuous; but they emit a most disagreeable odour; are succeeded, in most of the sorts, by large bunches of ripe berries in autumn, which, although very unpalatable to eat, are in high estimation for making that well-known cordial liquor called Elder-wine, particularly the common Black-berried Elder; which ripen for that purpose in September and October, and should be gathered accordingly as soon as fully ripe.

The merit of Elders in gardening may be both for use and ornament, especially in large grounds.

With

With respect to the tree and shrub kinds, the common Elder may be introduced occasionally in forest-tree plantations, and as detached standards, in any by-place, for the sake of their berries, as before hinted; and all the sorts may be employed to diversify large ornamental plantations, disposed, however, but thinly, particularly the Common Elders, as their flowers send forth a strong disagreeable scent, so should be but sparingly introduced near much frequented places; however, the different varieties thereof may be dispersed in out-plantations so as to effect an agreeable diversity; but as to the *Sambucus racemosa* and Canada Elder, they may be disposed in any of the shrubbery compartments, more particularly the former, which will exhibit a conspicuous singularity in its mode of flowering and fruiting.

And the Common Elder, being a very fast grower, is often employed in forming outward hedges along ditch-sides, or the sides or tops of banks, where it is necessary to form a hedge-fence as cheap and expeditiously as possible, which may be raised from cuttings of the strong shoots of from one or two to five or six feet long, planted at once where the hedge is intended, a foot distance in the row; and from one to two feet deep in proportion to their length; but the short and middling cuttings generally form the closest hedge from the bottom: though long cuttings are sometimes used in order to form an immediate fence, which being arranged chequer-ways will render the fence stronger, and more immediately fencible against cattle. The hedges, raised by either method, if designed merely as a fence, should be trained only to a moderate height, and kept close and regular by an annual clipping: but some suffer these Elder hedges to grow up rough, in a natural growth, without any trimming, especially at top, permitting them to branch out on each side upward, in order to produce large crops of berries, either for private use or for sale.

As to the Dwarf Elder, it is sometimes admitted in gardens, by way of variety, in the herbaceous collection, and for medical use; observing, as this perennial multiplies exceedingly by its creeping root, it must be occasionally trimmed at bottom to confine it within moderate limits.

In most of the species of Elder, the leaves and flowers impart a strong, disagreeable, and almost nauseous smell; especially the common and dwarf Elder, in which the leaves and whole plant are so very bitter that few animals will browse upon them; and the dwarf Elder in particular exhales so

strong a disagreeable odour, they on that account are sometimes planted round granaries to drive away rats, and other vermin; and sometimes large spreading branches of Elder, of both these sorts in summer, when full of leaves, are drawn over fields of young turneps just come up, when thought in danger of being attacked by the fly, often so destructive to these crops, the elder leaves diffusing their rank odour on the ground and young turneps, and the bitter effluvia remaining, has sometimes a good effect, in proving noxious to those devouring insects, as in some degree to prevent, or greatly check their general attack and depredations on the above young plants.

The bark, buds, leaves, and flowers of the common Elder are used in medicine; the leaves are applied outwardly in fomentation to the piles, and swellings; the flowers infused in whey are beneficial in disorders of the skin; and from the berries are prepared a spirit, a wine, and an oil, which promote urine, perspiration and sweat; the juice of the dwarf Elder (*Sambucus Ebulus*) is recommended in dropical disorders; and the berries are a gentle purge.

Method of Propagation, &c.

All the tree and shrub Elders are propagated very expeditiously by cuttings of the young yearling shoots, and may also be easily raised from seed.

By Cuttings. — Cuttings of Elder shoots, in lengths of from one or two to five or six feet, very readily grow, and may be planted in autumn, or any time in open weather, from October till spring, though the spring, in February or March, is rather the more proper season for planting them; as when planted in autumn or winter, not having struck root, are liable to be killed by rigorous frost; choosing cuttings of the last year's shoots, not those that are green and succulent, but such as are become a little woody; and for general planting, cut them about fifteen or eighteen inches to two-foot lengths, or observing, that if they are designed for nursery rows to train occasionally for different purposes, cut them into short lengths of about three joints, planting them in rows two feet asunder, each cutting two parts of three in the ground: they will readily emit roots in the spring, and shoot strongly at top in summer, training them for the purposes wanted, some to run up with a single stem for standards, others to form bushy shrub-like plants, &c. and in a year or two they may be transplanted finally, if required.

Or if intended to form an Elder-hedge, cuttings of the Common Elder, of the above length,

mon Black Elder-tree, and the Herbaceous Dwarf Elder; the other two are foreigners, one being from the south of Europe, and the other of America; but are all hardy enough to grow here in any situation.

Tree and shrub kinds.

1. *SAMBUCUS nigra.*

Black-berried, or Common Elder-tree.] Rises with a tree-like stem, branching out numerous into a large spreading head, twenty feet high; pinnated leaves, of two or three pair of oval lobes and an odd one; and large, cymose, five-parted umbels of white flowers towards the ends of the branches, succeeded by large bunches of black, and other different coloured berries, in the varieties.

Varieties.] Common Black-berried Elder-tree.—White-berried Elder.—Green-berried Elder.—Lacinated or Parsley-leaved Elder, having the folioles much lacinated, so as to resemble parsley-leaves.—Gold-striped-leaved Elder.—Silver-striped Elder.—Silver-dusted Elder.

All these being varieties of *Sambucus nigra*, mostly of a tree-like growth, and have, for the general part, five or seven-lobed leaves, and quinquepartite umbels of flowers and fruit; the common Black-berried Elder, however, is the most generally known variety, and the most commonly cultivated: sometimes as standards in plantations of other common hardy trees, but more frequently in forming outward hedges expeditiously, as being a very fast grower; likewise often in detached standards in orchards and in hedge rows, &c. for the sake of their berries for making of Elder-wine; and all the varieties may also be employed for diversifying plantations: all the varieties make very strong shoots, full of a white pithy substance, but becomes woody as they advance in age, and the old wood becomes solid and very hard, fit for many purposes: all of which varieties will grow in any situation, and may be raised very expeditiously by cuttings of the year-old shoots. See the *Propagation*.

The bark, buds, leaves, and flowers are used in medicine, being sovereign in many disorders.

And the ripe berries make an excellent cordial wine.

2. *SAMBUCUS racemosa.*

Racemous flowering, Red-berried Elder.] Rises with a tree-like stem, branching ten or twelve feet high, having reddish-brown branches and buds; pinnated leaves of six or seven oval deeply-sawed lobes, and compound, oval, racemous clusters of whitish-green flowers, succeeded by oval clusters of red berries.

This is a resident of the mountainous parts

of the south of Europe, and is retained in our gardens as a flowering shrub, having a peculiar singularity in its oval-clustered flowers and berries.

3. *SAMBUCUS canadensis.*

Canada Shrubby Elder.] Rises with a shrubby stem, branching eight or ten feet high, having reddish shoots; somewhat bipinnated leaves, often ternate below, composed of five, seven, or nine oval lobes; and towards the ends of the branches, cymose, quinquepartite umbels of flowers, succeeded by blackish red berries.

Herbaceous kinds.

4. *SAMBUCUS Ebulus.*

Herbaceous Elder, commonly called Dwarf Elder.] Hath a thick, creeping, tough, perennial root, spreading widely around; herbaceous, strong, pithy, green stems three or four feet high; large pinnated leaves, of from three or four to six or seven pair of long, acute-pointed, indented lobes, with leafy stipulæ, and large, cymose, three-parted umbels of white flowers, succeeded by black berries in autumn.

This is a perennial, and grows wild in England in hedges, hanks, and fields, but is admitted in some gardens for variety and medical uses.

Variety.] Lacinated-leaved, having the folioles beautifully jagged into segments.

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Method of Propagation, &c.

All the tree and shrub Elders are propagated very expeditiously by cuttings of the young yearling shoots, and may also be easily raised from seed.

By Cuttings. — Cuttings of Elder shoots, in lengths of from one or two to five or six feet, very readily grow, and may be planted in autumn, or any time in open weather, from October till spring, though the spring, in February or March, is rather the more proper season for planting them; as when planted in autumn or winter, not having struck root, are liable to be killed by rigorous frost; choosing cuttings of the last year's shoots, not those that are green and succulent, but such as are become a little woody; and for general planting, cut them about fifteen or eighteen inches to two-foot lengths, or observing, that if they are designed for nursery rows to train occasionally for different purposes, cut them into short lengths of about three joints, planting them in rows two feet asunder, each cutting two parts of three in the ground: they will readily emit roots in the spring, and shoot strongly at top in summer, training them for the purposes wanted, some to run up with a single stem for standards, others to form bushy shrub-like plants, &c. and in a year or two they may be transplanted finally, if required.

Or if intended to form an Elder-hedge, cuttings of the Common Elder, of the above
6 L 2 length,

length, may be planted at once, where the hedge is intended, either in a single or double row, about a foot asunder.

But in some particular cases, large cuttings of from a yard to five or six feet long, or more, particularly of the Common Elder, may be planted in any moist situation, or along ditch-sides, either to form spreading standards, as soon as possible, for producing plenty of berries, or to form a growing hedge immediately fencible, as it were; in either case, planting the cuttings of this length half a yard deep, and ten or fifteen feet asunder, for the standards, and one foot apart for the hedge, arranged either flanking or chequerways, as before observed.

The planting of all these cuttings may be performed either with a long iron-shod dibble, or, for the larger long sets, make holes with an iron crow, or a large stake driven into the ground: or, sometimes, in moist, soft, deep soils, the ends of the cuttings being sharpened, they may be thrust into the ground a proper depth, especially the moderate-sized cuttings.

By Seed.—This mode of propagating Elders is not generally practised, they being much more expeditiously raised from cuttings as above; however, they may also be easily raised in abundance from the seed or berries, sown in autumn, in beds of common earth, half an inch deep, and managed as other nursery seedling trees.

The scattered or self-sown seeds of these trees, falling any where accidentally, either on the ground, in the crevices of old walls, or hollow trees, grow without care or trouble, and produce young plants.

The fourth sort, *Sambucus Ebulus*, is propagated very plenteously by parting the roots in autumn.

SAND, See COMPOSTS, EARTH, LOAM, &c.

SANGUINARIA, Puccoon.

This genus affords, for our purpose, one low, herbaceous, flowering perennial for the flower borders, rising with a low stalk, crowned with octa-petalous flowers.

Class and order, *Polyandria Monogynia*.

Characters.] CALYX, two oval concave leaves that fall away. COROLLA, eight oblong, obtuse, spreading petals. STAMINA, many short filaments, having single antheræ. PISTILLUM, an oblong compressed germen, no style, but a thick, two-furrowed, permanent stigma. PERICARPIUM, an oblong-bellied bivalvular capsule, having many roundish acute seeds.

There is but one species, viz.

SANGUINARIA *canadensis*.

Canada Sanguinaria, or Puccoon.] Hath a tuberous fibrated root, crowned with large, roundish, indented leaves, and low, slender, leafless stalks, terminated each with one large, octa-petalous, pure-white flower.

Varieties.] Single-flowered—Semi-double-flowered—Full-double-flowered.

They are all perennial in root, but annual in stalk and leaves; the stalks rising in the spring, and flower in April, very ornamentally.

All the varieties are hardy, and proper to intermix with other low spring flowers in the fronts of the borders and other compartments; should be planted in autumn, when the stalks and leaves are decayed, any time from August till October, planting them about a foot, or fifteen or eighteen inches from the edge of the border, and about two or three inches deep, and they will all flower in spring following.

They are all easily propagated by parting the roots in autumn, when the leaves and stalks decay.

The roots of all the varieties of these plants, when broken asunder, pour forth a bright-red or orange-coloured juice, with which, it is said, the Canada Indians paint themselves of those colours.

SANTOLINA, Lavender Cotton.

This genus furnishes low, under-shrubby ever-greens, and herbaceous perennials, for ornamenting the pleasure ground, and for medical use, garnished with very small hoary leaves, simple and pinnated, in different species, and compound rayless flowers terminating the branches.

Class and order, *Syngenesia Polygamia Æqualis*.

Characters.] CALYX, a hemispherical, imbricated, general cup. COROLLA, a compound uniform flower, consisting of numerous hermaphrodite, tubulous, funnel-shaped florets. STAMINA, five fine hair-like filaments, and cylindric tubulous antheræ. PISTILLUM, an oblong tetragonous germen, filiform style, and two oblong, depressed, truncated stigmas. PERICARPIUM none; each floret is succeeded by one four-cornered seed, resting on the common receptacle.

There are four species; two of them are shrubby and two are herbaceous; all originally exotics from the south of Europe, but hardy enough to prosper here in the open ground, all the year.

Shrubby Kinds.

Consist of two low, shrubby, bushy perennials,

ennials, comprising some varieties, all durable in root, stem, and branches, and retain their leaves the year round, mostly assuming a hoary-whitish appearance.

1. *SANTOLINA Chamæ Cyparissus*.

Dwarf Cypress, or Common Lavender Cotton.] Rises with a low, shrubby stem, very branchy and bushy, two or three feet high, very closely garnished with minutely small, indented, hoary leaves, quadrifarious or ranged four ways; and the branches terminated by long peduncles, each supporting one compound yellow flower.

2. *SANTOLINA rosmarinifolia*.

Rosemary-leaved Lavender Cotton.] Rises with a shrubby stem, branching numerously from one or two feet to a yard high, in different varieties, closely garnished with small linear hoary leaves; with tuberculated margins, and the branches terminated by long pedunculi, each sustaining one compound pale-yellow flower.

Varieties of this.] Greater Rosemary-leaved Lavender Cotton, growing about a yard high—Minor Rosemary-leaved Lavender Cotton, with blunt leaves growing in clusters—Dark-green-leaved—Villose hoary-leaved, with a large flower.

The above two shrubby Lavender Cottons, and varieties are retained in our gardens both as plants of ornament and for medicinal use, the leaves, flowers, and seeds being proper, particularly the first species.

Herbaceous Kinds.

3. *SANTOLINA anthemoides*.

Anthemis-leaved Lavender Cotton.] Hath fibrous perennial roots, herbaceous, very branchy, hairy stalks, eight or ten inches high; bipinnated, many-parted downy leaves like those of chamomile, and the branches terminated by long pedunculi, each sustaining one compound yellow flower.

4. *SANTOLINA alpina*.

Alpine Lavender Cotton.] Hath fibry perennial roots, herbaceous unbranching stalks eight or ten inches high, bipinnated grey leaves, and pedunculi terminated by one yellow flower.

The two shrubby species and varieties, being hardy, low, bushy evergreens, are proper ornamental plants for adorning borders, and the fronts of small shrubbery compartments, where, with their hoary, and lighter and darker-green leaves, in different varieties, they will exhibit an agreeable variety. Some may also be potted, to move occasionally, to embellish any particular compartment in assemblage.

The herbaceous kinds being also hardy, are

likewise employed occasionally to cause variety in the pleasure ground.

Method of Propagation.

The shrubby kinds are propagated the most expeditiously by slips or cuttings of the young shoots, and may also be raised from seeds.

By Slips or Cuttings.—In spring, or early in summer, slip or cut off a quantity of the last year's shoots, five or six inches long, clear away all the lower leaves, then plant them in any shady border in rows half a foot asunder, water them directly, and repeat it in dry weather, and they will root freely and form tolerable plants by autumn, when, or in the following spring, they may be transplanted with balls, in wider nursery-rows, &c. or some of the largest where they are finally to remain.

By Seed.—Sow it in the spring, in a bed of light earth, either in shallow drills or all over the surface, covering it a moderate depth; they will grow the same year, and towards autumn, or in the next spring, prick them out half a foot asunder, and after having a year's growth they must be transplanted to wider distances.

The two herbaceous kinds are propagated by parting the roots in autumn, and by seed in the spring, sown in any common earth, and raked in; and when the seedlings are a little advanced in growth plant them out.

SAPINDUS, Soap-berry Tree.

It consists of tree-like, shrubby, and other tender exotics of the East and West Indies, retained here in our stove collections, adorned with winged and trifoliate leaves, and spikes of small, quadripetalous flowers.

Class and order, Octandria Trigynia.

Characters.] *CALYX*, a four-leaved spreading cup, each leaf is ovate, plane, spreading, and coloured. *COROLLA*, four ovate unguiculate petals, with four oblong, concave, erect leaves for the nectarium, inserted in the base of the petals. *STAMINA*, eight filaments with cordate, erect antheræ. *PISTILLUM*, a trilobate germen, with three short styles, and blunt, simple stigmas. *PERICARPIUM*, three fleshy, ventricose, variated capsules, joined together, containing one, two, or three nuts.

The species are,

1. *SAPINDUS Saponaria*.

Common Indian Soap-berry tree.] Rises with a woody stem, where it is a native, to the height of twenty or thirty feet, sending out many branches, garnished with winged lanceolate leaves: the flowers which are small and white, come out in loose spikes at the ends of the branches, and are succeeded by round saponaceous berries.

2. *SAPINDUS rigidus*.

Rigid

Rigid Ash-leaved Soap-berry Tree.] Rises about twenty feet high with strong woody branches, garnished with ovate-oblong winged leaves; the flowers come out in spikes from the ends of the branches, and are succeeded by smooth berries.

3. *SAPINDUS trifolius*.

Trifoliate Malabar Sapindus.] With leaves composed of three folioles.

4. *SAPINDUS chinense*.

Chinese jagged-leaved Sapindus.] With pinnated leaves, having the folioles jagged.

The propagation of these plants is by seeds sown in pots, and plunged in a hot-bed early in the spring; the young plants soon arise, and may be transplanted into single pots, and replunged into the hot-bed, and by degrees inured to the open air; and towards autumn, plunged in the bark-bed in the stove, and managed as other plants of the woody kind.

SAPONARIA, Soap-wort.

The plants are herbaceous perennials and annuals, of hardy temperature, some of the former being cultivated as flowering plants for variety, &c. producing annual stalks two or three feet high, terminated by bunches of pentapetalous flowers.

Class and order, *Decandria Digynia*.

Characters.] *CALYX* is monophyllous, tubular, quinque-dentate and permanent. *COROLLA*, five petals, narrow and angular below, and broad, obtuse, and plane above. *STAMINA*, ten awl-shaped filaments, inserted alternately into the ungues or tails of the petals, having long incumbent antheræ. *PISTILLUM*, a cylindric germen, two parallel styles crowned with acute stigmas. *PERICARPIUM*, a cylindric, covered, unilocular capsule, having many small seeds.

There are several species, one of which only is common to the English gardens, viz.

SAPONARIA officinalis.

Common Soap-wort.] Hath a creeping, very spreading, perennial root, upright jointed stalks, two feet high or more, garnished with oval-lanceolate opposite leaves, and the stalks terminated by umbel-like bunches of purplish flowers.

Varieties.] Common single-flowered Soap-wort—Double-flowered—Hybrid Soap-wort with concave leaves.

This species grows wild in England, but is sometimes retained in gardens for variety, particularly the Double-flowered and Hybrid concave-leaved sort; they all succeed in any common soil, are durable in root, which send up stalks annually in the spring, and flower in July, continuing in succession till September.

The root and leaves are used in medicine; and the leaves were formerly used instead of Soap, and by being boiled in water afford a soap-like froth, proper for washing cloaths; hence the name Soap-wort.

These plants are easily propagated by parting the roots, any time in open weather, from autumn till spring.

SARRACENA, Side-saddle Flower.

A genus consisting principally of herbaceous perennials, admired for the singularity of their leaves and flowers; they rising with numerous large leaves of a singular construction, pitcher-shaped, and hollow, and upright stalks, decorated at top with large pentapetalous, inflexed, purple and yellow flowers, placed singly.

Class and order, *Polyandria Monogynia*.

Characters.] *CALYX*, a double perianthium, the lower one composed of three small oval deciduous leaves, and the upper one of five large coloured leaves, which also fade away and fall off. *COROLLA*, five oval inflexed petals, having oval-oblong claws. *STAMINA*, numerous small filaments, topped with simple antheræ. *PISTILLUM*, a roundish germen, very short cylindric style, crowned with a clavated, peltated, pentangular stigma, covering the stamina. *PERICARPIUM*, a roundish quincloocular capsule containing many roundish, pointed seeds.

The species for our purpose are,

1. *SARRACENA purpurea*.

Purple Sarracena.] Hath a fibrous, deep-striking root, sending up many pitcher-shaped, firm leaves, rising from a small base, widening gradually in an erect position, so as to contain a quantity of water; and from the root an upright, round, naked flower-stem, half a yard high, adorned at top with singly-placed, large fine purple flowers, hanging in a drooping posture; appearing in June, and sometimes succeeded by ripe seeds in autumn.

2. *SARRACENA flava*.

Yellow Sarracena.] Hath a fibrous root as the former, sending up numerous hollow leaves, standing on a slender base widening to the top, a yard high, and upright naked stalks, terminated by singly-placed, yellow flowers, appearing in June or July.

Variety.] With greenish flowers.

Both these species of *Sarracena* are natives of North America, residents of moist boggy places; and in this country should have a somewhat similar situation, either in a bed, border, or pots; but should be guarded against severe frost for their protection.

They are propagated by seed, and by offsets of the roots, though with no great certainty

tainty of success in this country, so that the plants are occasionally procured from America; and are kept in most of the principal nursery grounds.

SATUREIA, Savory.

This genus is composed of low, under-shrubby, and herbaceous aromatic perennials and annuals, for the kitchen-garden, pleasure ground, and green-house, ornamented with small narrow leaves, and small monopetalous ringent flowers at the sides and termination of the branches.

Class and order, *Didynamia Gymnospermia*.

Characters.] CALYX is monophyllous, erect, tubulous, striated, five-parted at top, and permanent. COROLLA is monopetalous and ringent, with a cylindric tube, and labiated, having the upper lip acutely emarginated, and the under lip three-parted. STAMINA, two long and two short filaments, crowned with connivent antheræ. PISTILLUM, a quadrifid germen, a bristly style, having two bristly stigmas. PERICARPIUM, none: four roundish naked seeds lodged in the permanent calyx.

There are eight or nine species; the following six of which are the sorts principally known in our gardens, being all exotics from different countries; three of which are hardy, and the others tender, requiring shelter of a green-house in winter.

Hardy Kinds.

Consist of three species; two low, under-shrubby, and herbaceous perennials, and one annual; all of the aromatic tribe; two of which, Winter Savory and Summer Savory, are eminent pot herbs for the kitchen-garden, and for medical use.

1. SATUREIA montana. (Perennial.)

Mountain, or common Winter Savory.] Rises with a low, under-shrubby stem, branching numerously about a foot high; closely garnished with small linear-lanceolate leaves, many together at the joints; and at the sides of the branches, short, forked peduncles, supporting small whitish-red flowers.

This is a fine aromatic perennial, durable in root, stem, and branches, and continues in leaf the year round.

2. SATUREIA virginiana. (Perennial.)

Virginian Savory.] Rises with upright, stiff, angular stalks, branching a foot and half high; small spear-shaped, pointed, stiff leaves, scented like penny-royal; and the branches terminated by white flowers in round heads.

3. SATUREIA hortenfsis. (Annual.)

Garden, or Summer Savory.] Rises with upright slender stalks, branching by pairs a foot or more high; narrow, spear-shaped, stiff, odori-

ferous leaves, and from the sides of the branches pale-red flowers, two on each peduncle.

This is a choice aromatic annual pot-herb for the kitchen-garden.

Green-house Kinds.

They consist of three low, under-shrubby, ever-green, aromatic perennials, exotics from warm countries, and require shelter in winter.

4. SATUREIA Juliana.

St. Julian's whorled Savory.] Rises with erect, slender, ligneous stalks, branching moderately nine or ten inches high; narrow, spear-shaped, finely-scented leaves, and small white flowers, in whorled bunches, round the branches.

5. SATUREIA Thymbra.

(Legitimate Thymbra)—or Hispid-whorled Savory.] Rises with shrubby stems, branching about two feet high; oblong, acute, odoriferous leaves, and reddish flowers, in thick hispid whorls round the branches.

6. SATUREIA capitata.

Capitated Savory.] Rises with shrubby, slender stalks, branching eight or nine inches high; narrow, carinated, punctated, ciliated leaves; and the branches terminated by capitated spikes of white flowers.

All these six species of Savory are of low, bushy growth; mostly evergreen except the hortenfsis; and flower in June and July; the flowers are small, and each formed of one ringent petal, and in some sorts are succeeded by seeds in our gardens, particularly the Winter and Summer Savory.

With respect to the three hardy species, the two first are perennial, and the third is annual; are all hardy enough to succeed in the open ground; the first and third sort merit culture in every kitchen-garden, as aromatic pot-herbs and as medical plants; and all the three sorts may also be employed to diversify the compartments of the pleasure garden, &c. allowing them generally a dry soil.

And the tender kinds, requiring shelter from frost, must be kept in pots, and placed among the green-house exotics, where they will increase the variety, managing them as other shrubby exotics of that collection.

Method of Propagation for all the Sorts.

The three hardy sorts are propagated, some by seed, and the two perennials also by slips or cuttings of the branches, and by parting the roots.

By Seed.—The Winter and Summer Savory furnish plenty of seed annually in autumn, by which they may be raised in abundance, sown in the open ground in spring; for which, in the latter end of March, or in April, dig a bed or border of light rich earth, and sow the seed

seed thereon moderately thick, and rake them in evenly, they will soon come up; being then careful to give occasional weeding, and if the plants are any where too much crowded, thin them moderately, and they may either remain where sown, thinning them to small distances, or may be transplanted.

Observe, however, of the Winter Savory, that when the seedlings are about two or three inches high, it is eligible to plant out a quantity of the strongest, in moist weather, in nursery-rows six inches asunder, to remain till September or spring following, then to be transplanted with balls where they are finally to remain, in rows a foot asunder.

But the annual or Summer Savory may either be sown in small drills, six inches asunder to remain, or broad-cast and raked in lightly, and thinning the plants six inches distance; or when two inches high, a quantity may be pricked out in beds, in rows the above distance; in either case the plants will become useful in June or July until winter, when they will totally perish.

Or, when designed to have the Winter or Summer Savory remain where sown, the seeds may be sown in shallow drills, either in beds or along the edge of any bed or border by way of an edging.

By Slips, &c.—In the spring or early part of summer, the common Winter Savory may be increased plentifully by slips or cuttings of the young shoots or branches, which very freely take root; therefore, slip or cut off a quantity of young shoots five or six inches long, plant them with a dibble in any shady border in rows six inches asunder, giving occasional waterings, and they will be well rooted by September, when they may be transplanted with balls where wanted; those for the kitchen-garden plant in rows a foot asunder, or may be planted in rows along the edge of any border, or other compartment, by way of an edging, as before observed of the seedlings.

By parting the Roots.—The above, and the Virginian Savory, in particular, may be propagated in plenty by parting the roots in autumn or spring.

The three tender kinds are very easily propagated by slips or cuttings in May, June, or July, choosing some of the most robust young side-shoots, slipping or cutting them off, and plant them in pots, several in each, which, if plunged in a hot-bed, will greatly facilitate their rooting, or, in default thereof, place them under a frame and lights, or hand-glasses, shading them from the sun, and give water, they will soon show signs of growth, when let them enjoy the free air, and, when well rooted, to-

wards autumn, transplant them in separate pots.

As these kinds are apt to dwindle off in three or four years, it is therefore proper to continue raising a fresh supply of new plants accordingly.

SATYRIUM, Satyrion, or Lizard Flower.

A genus of bulbous-rooted, hardy flowering perennials, sending up annually leaves and flower-stems, which are terminated by spikes of pentapetalous, nectariferous flowers.

Class and order, *Gynandria Diandria*.

Characters.] **CALYX**, a vague spatha, protruding a simple spadix of flowers, without perianthiums. **COROLLA**, five ovate-oblong petals, three of them exterior, and two interior, rise upward and meet, and a monophyllous nectarium, between the divisions of the petals, having a short upper lip, the under plane, pendulous, and scrotiform. **STAMINA**, two short gynandrous filaments, and obovate antheræ. **PISTILLUM**, an oblong contorted germen below the flower, the style is connected with the upper lip of the nectarium, and compressed obtuse stigmata. **PERICARPIUM**, an oblong, three-keeled, trivalvate, one-celled capsule, containing many small scobiform seeds.

This genus hath a great affinity to the *Orchis*. See *ORCHIS*.

The species for our purpose are,

1. **SATYRIUM hircinum**.

Stinking Lizard Satyrion.] Hath a solid undivided root, the stem rises eighteen inches high, garnished with lanceolate leaves, five inches long; the flowers which come out in a spike on the upper part of the stalk, are of a dirty white, with linear streaks, and spots of a brown colour, with the lip of the nectarium trifid, and the middle segment linear and end-bitten.

2. **SATYRIUM viride**.

Green, Frog Satyrion, or Orchis.] Hath a palmate, bulbous root, the stem rises about a foot high, the lower part of which is garnished with oblong obtuse leaves, about three inches long; the flowers which terminate the stems come out in a long slender spike, and are large yellowish-green, with some purple, and the lip of the nectarium divided into three linear parts, the middle one being obsolete.

This species grows on dry pastures and chalk hills in several parts of England.

3. **SATYRIUM albidum**.

White Satyrion.] Hath numerous cylindric roots joined together, with a stalk rising eight inches high, with the lower part garnished with spear-shaped leaves, three inches long; the stalk is terminated by a thick spike of a whitish colour, with the lip of the nectarium trifid-acute, the middle segment being the largest.

All

All the Satyrions are hardy, perennial, durable roots, but annual in leaves and flowers; they grow spontaneously in many parts of this kingdom, and are kept in curious gardens for variety.

They are propagated by seeds and off-sets from their roots, in like manner to the Orchis. See ORCHIS.

SAXIFRAGA, *Saxifrage*.

This genus comprehends many low, and moderate-growing, hardy, herbaceous perennials, principally for ornament and variety; several of which producing ornamental flowers, are proper for the decoration of the pleasure-ground, rising mostly with annual stalks, some a foot high or more, others not so much, adorned with small lobated and entire leaves, and terminated with small pentapetalous flowers.

Class and order, *Decandria Digynia*.

Characters.] CALYX is short, monophyllous, five-parted, and permanent. COROLLA, five patent petals. STAMINA, ten awl-shaped filaments, with roundish antheræ. PISTILLUM, a roundish acuminate germen, two short styles, and obtuse stigmas. PERICARPIUM, an oval, birostrated, or two-beaked, unilocular capsule, containing numerous small seeds.

There are upwards of thirty species of this genus, but not more than seven or eight that are esteemed for general culture, which are considered generally as flowery plants, for variety in the pleasure-ground, as aforesaid.

The principal species are,

1. SAXIFRAGA *granulata*.

Granulous-rooted, or Common White Saxifrage.] Hath a granulous perennial root, being composed of numerous small tuberos parts like grains of corn, crowned with many small, kidney-shaped, lobated leaves, upright branchy stalks, a foot high; garnished also with kidney-shaped leaves, and terminated by tufted bunches of numerous white flowers.

Varieties.] Common Single-flowered of the meadows—Double-flowered of the gardens, being very ornamental.

They flower in April and May, which, when in large tufts, as many stalks rise close together, they make a very ornamental appearance, particularly the Double-flowered variety, and may be disposed both in patches towards the fronts of borders, and in pots.

2. SAXIFRAGA *Cotyledon*.

Cotyledon Saxifrage, with a paniculated and pyramidally branching stalk.] Hath a thick, fibrated, perennial root, crowned with tongue-shaped, cartilaginous-sawed leaves, in an aggregate cluster like house-leek, an upright pa-

niculated branching stalk; a foot or more high, having all the branches terminated by panicles of white flowers.

Varieties.] Common Paniculated Cotyledon Saxifrage—Pyramidal Saxifrage, branching almost from the bottom a foot and half high, with the branches diminishing gradually in length upward, and all of them terminated by spreading white flowers; the whole forming a beautiful pyramid.

3. SAXIFRAGA *crassifolia*.

Thick large-leaved, Purple Saxifrage.] Hath a fibrated perennial root, crowned with a tuft of large, oblong-oval leaves, slightly crenated, and upright stalks, rising a foot high; terminated by a large panicle of purple flowers, very ornamental in April and May.

4. SAXIFRAGA *umbrosa*.

Umbrose Saxifrage, commonly called London Pride, or None-so-pretty.] Hath a fibrated perennial root, crowned with ob-oval nearly retused leaves in circular heads, having cartilaginous crenated margins; and upright, slender, naked, paniculated stalks a foot or more high, terminated by panicles of whitish flowers spotted with red, having also red pistils.

This is an old inhabitant of our gardens, and was formerly planted for edgings, though it is rather improper for that purpose; but being disposed in tufts about the borders, it will effect a proper variety.

5. SAXIFRAGA *hypnoides*.

Cushion Saxifrage, commonly called Lady's Cushion.] Hath a fibrated perennial root, crowned with narrow trifid leaves, many trailing spreading shoots, garnished with entire and trifid leaves, and upright, almost naked stalks, but a few inches high, terminated by small bunches of whitish flowers.

The trailing shoots and leaves of this plant forming a close roundish bunch like the shape of a cushion or pillow, hence it is commonly called Lady's Cushion.

6. SAXIFRAGA *punctata*.

Spotted Saxifrage.] Hath a fibrous perennial root, crowned with roundish indented leaves, in a circular cluster, on long foot-stalks, and upright, slender, naked stalks, a foot high, terminated by panicles of white flowers spotted with red punctures.

7. SAXIFRAGA *hirsuta*.

Hairy Saxifrage.] Hath a fibrous perennial root, crowned with heart-shaped-oval retuse leaves, with cartilaginous crenated edges, and hairy leafless stalks, near a foot high, terminated by panicles of white flowers, having a few red spots.

8. SAXIFRAGA *sarmentosa*.

Sarmentous, or Shoot-bearing, Strawberry Saxifrage.] Hath a fibrous, perennial root, sending forth runners, as the strawberry; the leaves arise from the root upon red foot-stalks, they are roundish, slightly crenated, and pleasantly variegated, the stalk rises about a foot high, furnished with distant pedicles, sustaining each a nectarious flower with five petals; the three upper ones are small and spotted with red, the two lower ones are very long, spear-shaped, and of a pale flesh colour.

This species being a native of China, requires some protection in winter.

The first seven species are all hardy perennials, generally considered as flowery plants; but the first three or four sorts are the most commonly cultivated; and have the greatest merit as plants of ornament; however, all the sorts may be employed for variety, and disposed in patches towards the fronts of flower-borders, &c. and the first and second sort are also often planted in pots to move to any place occasionally, more particularly the Granulous Double White Saxifrage, and the Cotyledon Pyramidal Saxifrage, both of which demand singular attention for their ornamental flowers.

They are all durable in root, and some sorts also retain their leaves all the year; the Granulous Saxifrage, however, is deciduous, and all the sorts produce flower-stalks annually in the spring, flowering, in the different sorts, from April till June; the first species and variety generally flower in April and May, and the others in May and June.

All the sorts are very easily propagated by off-sets of the roots and heads, which they furnish abundantly.

The first sort multiplies exceedingly by its granulous roots, which, towards autumn, when their stalks and leaves decay, may be divided, not too small, but in little bunches, and let them be planted again directly, some in the open borders, &c. and some in pots, forming a small hollow in the earth an inch deep, in which deposit the bunch of roots, covering them the same depth with earth; and being thus planted in bunches, they will send up several stalks in a cluster together, and exhibit a large tuft of flowers.

The second, third, and fourth species multiply very fast by side off-sets from the root and head, or crown of the plant, each furnished with roots, which may be parted or separated in autumn, or early in the spring, and planted where they are finally to remain, observing to plant some of the Cotyledon pyramidal sort in pots, and the others in patches towards the middle and front of the borders.

The other hardy sorts are also propagated by off-sets, and parting the roots, in autumn or spring, and the eighth is easily propagated by its runners.

SCABIOSA, Scabious.

This genus of plants consists of herbaceous annuals, biennials, and perennials, for ornament and variety in the pleasure-ground, and shrubby perennials for the green-house, garnished with leaves of different forms in the different species, and terminated with numerous round aggregate heads of flowers, each head composed of many small florets contained in one general calyx.

Class and order, *Tetrandria Monogynia*.

Characters.] CALYX, a spreading, many-leaved, general cup, containing many florets, each floret having a double calyx. COROLLA, the general flower a round aggregate of many florets; each floret of the aggregate is monopetalous, tubulous, and cut into four or five parts at top. STAMINA, four awl-shaped filaments in each floret, having oblong incumbent antheræ. PISTILLUM, a germen under each floret, and a slender style, crowned with an obtuse, obliquely emarginated stigma. PERICARPIMUM, none; a single, oblong-oval seed to each floret, crowned with its partial calyx, and resting on the elevated general receptacle.

There are many different species of Scabiosa; a few only are in esteem for general culture, principally as plants of ornament and variety, consisting of ten hardy herbaceous annuals, biennials, and perennials; and four shrubby exotics for the green-house.

Hardy herbaceous Kinds.

This head comprehends some remarkably flowery annuals and biennials, and several perennials, rising with upright branchy stems, two or three feet high or more, garnished with leaves below; and numerous flowers at top; observing, the first two are annuals, the rest perennial; but the annual kinds are the most generally known, and cultivated as ornamental plants.

I. SCABIOSA *atropurpurea*. (*Annual-Biennial*.)

Dark-Purple Indian Scabious.] Hath a fibrous annual-biennial root, crowned with a large tuft of oblong leaves, variously jagged and cut on the edges, and often into segments, and upright stems, branching numerously on every side, three feet high or more; and from the sides and ends of the branches, numerous dark-purple, and other coloured flowers, in the varieties, having all quinqued florets and awl-shaped receptacles.

Varieties.] Common Dark-purple Scabious — Pale

— Pale - purple - flowered — Red-flowered — White-flowered — Black-flowered — Hen and Chicken-flowered, having several small flowers arising from the sides of the main one — Striped flowered, &c.

They all flower in June, continuing in plentiful succession till September, forming a very ornamental appearance, and are succeeded by abundance of ripe seeds in autumn.

All the varieties of this species are very hardy, and may be considered both as annuals and biennials; for, being raised from seed forward in the spring, they will run up to stalk and flower the same year, and generally perish the following winter; but if not sown till summer, they produce only leaves that year, increase in strength, and remain vigorous till spring following, when they will shoot up vigorously into very strong branchy stems, and produce an amazing quantity of flowers from June till autumn, and furnish plenty of seeds, then totally perish root and stem towards winter, so that a fresh supply must be annually raised from seed both as annuals and biennials.

2. *SCABIOSA stellata.* (Annual-Biennial.) *Starry Spanish Scabious.*] Hath a fibrous annual-biennial root, crowned with oblong leaves, variously cut on the edges, and upright stems branching numerously about a yard high, garnished with oblong, finely cut leaves, and the upper part supporting numerous purple flowers composed of quinquefid star-shaped florets with roundish receptacles, flowering in July.

Varieties.] Greater jagged-leaved—Minor jagged-leaved—Red-purple-flowered—White flowered.

This species and varieties may also be treated both as annuals and biennials, as observed of the former sort.

3. *SCABIOSA integrifolia.* (Annual-Biennial.)

Entire-leaved Montpellier Scabious.] Having the radical leaves ovate, sawed, the branch ones spear-shaped; branches spreading; and all the florets quadrid:—purple.

4. *SCABIOSA arvensis.* (Perennial.)

Common Field Scabious.] Hath fibrous perennial roots, upright hispid stems, branching three feet high, garnished with pinnatifid leaves, with the lobes at a distance, and blue flowers, having radiated florets.

Varieties.] With reddish flowers,—Purple-flowered, &c.

It grows wild in the fields and meadows in England, but is sometimes cultivated for variety.

5. *SCABIOSA succisa.* (Perennial.)

Devil's Bit (Morsus Diaboli), or Root-bitten Scabious.] Hath a thick, short, downright root, terminated abruptly as if bit off, crowned with oval-spear-shaped, entire leaves; upright single stalks two feet high, with the branches growing near, and terminated by blue flowers with equal quadrid florets.

This grows naturally in England, &c. in pastures and woods.

6. *SCABIOSA alpina.* (Perennial.)

Alpine Blue Scabious.] Hath a strong, fibrous, perennial root, sending up several strong stems, branching four or five feet high, garnished with pinnated leaves of four or five pair of spear-shaped sawed lobes; and from the upper parts, whitish-yellow drooping flowers, having quadrid-equal florets.

7. *SCABIOSA argentea.* (Perennial.)

Silvery Oriental Scabious.] Rises with low slender stems, dividing into spreading branches, pinnated silvery-white leaves, with spear-shaped lobes, and the branches terminated by long, naked, smooth peduncles, sustaining small pale flowers with quinquefid florets.

8. *SCABIOSA graminifolia.* (Perennial.)

Grass-leaved Silvery Scabious of the Helvetic Mountains.] Hath a fibrous perennial root, sending up herbaceous stalks half a yard high, garnished below with very narrow, lanceolate, entire, silvery leaves; and the upper part supporting pale-blue flowers, having quadrid florets.

9. *SCABIOSA gramontia.* (Perennial.)

Gramontian Cut-leaved Scabious.] Having the stem leaves bipinnated, cut thread form, short calyx, and the florets five-cleft.

10. *SCABIOSA leucantha.* (Perennial.)

White-flowered Narbonne Scabious.] Having pinnatifid leaves; calyx scales ovate-obtuse, imbricated; and the florets four-cleft equal.

All these herbaceous kinds are very hardy plants, that succeed in any common soil of a garden, and in almost any situation.

But the two annual sorts are the most generally known and cultivated, and have the greatest merit as ornamental flowery plants.

Tender Shrubby kinds for the Green-house.

Comprises four shrubby species, exotics from warm countries, as mentioned in their titles, and require shelter here in winter, so must be kept in pots and placed among the green-house plants.

11. *SCABIOSA cretica.*

Cretan Shrubby Scabious.] Rises with a shrubby stem, branching two or three feet high; long, spear-shaped, whitish, entire leaves, numerously in clusters, and the

branches terminated by fine blue flowers, having quinquefid florets.

Variety.] Auricula-leaved.

12. *SCABIOSA africana*.

African Shrubby Scabious.] Rises with a shrubby stem, branching four or five feet high; oval-spear-shaped cut leaves, and the branches terminated by flesh-coloured flowers, leaving quinquefid florets.

Varieties.] Rough crenated-leaved—Finely cut-leaved—Woolly-leaved.

13. *SCABIOSA rigida*.

Stiff-leaved Shrubby Ethiopian Scabious.] Rises with a shrubby stem, branching two or three feet high; spear-shaped, serrated, stiff, shining leaves, and the branches terminated by whitish flowers, having quadrifid, nearly-radiated florets, and obtuse calycinal scales.

14. *SCABIOSA attenuata*.

Narrow-leaved Scabious.] Rises with a shrubby stem, branching three or four feet high; linear, smooth, entire leaves, winged at their base, and the branches terminated by flowers, having equal quadrifid florets.

All the above fourteen species of *Scabiosa* flower commonly in June, July, and August, and some continue in succession till autumn, generally producing the flowers upon long foot-stalks singly, each flower being an aggregate of several small quadrifid or quinquefid florets, placed all within one common calyx, forming together a moderately large flower, which, in some species, are exceedingly numerous, and very ornamental, and which in most of the sorts are succeeded by plenty of seeds in autumn.

The merit of these plants is, some for ornament, others for variety.

The three annual-biennial kinds, in particular, producing abundance of ornamental flowers, very conspicuously, two or three months in summer, are choice furniture for all the common flower compartments, and merit culture in every garden; being raised annually from seed in spring and summer, in the open ground, and thence planted out to remain to flower, which, in those of the spring sowing, will be effected the same year; but those raised in summer do not flower till the summer following.

The herbaceous perennial kinds may be introduced as flowering plants, in any large borders and other compartments of the pleasure ground, in which they will effect a very distinguished variety.

And the shrubby kinds being potted and placed among the green-house exotics, they will effect a good variety, and flower ornamentally in summer.

Propagation and Culture of all the Sorts.

First, the Annual and Biennial Sorts.—

The first three species, being hardy annuals and biennials, may be raised plentifully from seed annually, in a bed or border of common earth, and, as formerly noticed, may be considered both as annuals and biennials, and may be treated accordingly, more particularly the *Scabiosa atropurpurea* and varieties; observing, that if intended to raise any of the sorts as annuals, for flowering the same year, they should be sown in the spring, about February or March or beginning of April, on a warm border, or, to bring them as forward as possible, may sow them in a hot-bed; and being planted out about the borders, in May or beginning of June, they flower the same year in July or August, though not near so strong as plants raised the year before as biennials: therefore, in order to have strong flowering plants, it is most eligible to sow a principal share in June, July, or beginning of August; to increase in growth all the latter part of summer till the end of autumn, without running up to stalks, and stand the winter, for flowering early next summer, in which they will produce much stronger stems, branching more numerous and strong, and produce a greater number of flowers: however, it may be proper to sow both in spring for flowering the same year, and in June or July, &c. for next year's flowering; but it is more particularly proper to sow some of the Starry Scabious in spring as annuals.

Observe, in sowing these sorts, the first in particular should be sown for transplantation; also both the other annual-biennial kinds: choosing a bed or border of light earth, and either sow them in small shallow drills, five or six inches asunder, or sown on the surface and raked in evenly: and when the plants are two or three inches high, prick out some of the strongest, in moist weather, where they are to remain to flower, especially the spring-sown plants; but those designed for next year's flowering should be planted in nursery-beds, in rows six or eight inches asunder, giving necessary waterings and weeding, and they will grow fine large plants by autumn, when, or in the following spring, transplant them with balls of earth to the places where they are to flower.

But the Starry Scabious may also either be sown in spring for transplantation, or in patches about the borders, to remain where sown, to flower.

Perennial Sorts.—The hardy, herbaceous, perennial Scabiousses, are all very easily propagated, both by seeds sown in any bed or border

border of common earth in the spring, and the seedlings planted out where they are to remain, and by parting the roots in autumn.

Shrubby kinds.—All the shrubby sorts are expeditiously propagated by planting slips or cuttings of the branches in spring or summer; if in spring, plant them in pots, and place them either in a hot-bed or under shelter of glasses; but in summer they may be planted in the full ground, shaded and watered; and in either method they will root tolerably well the same year, and towards autumn may be potted off separately, and managed as other shrubby exotics of the green-house.

SCANDIX, Shepherd's Needle, Garden Chervil, &c.

This genus furnishes a hardy, herbaceous, aromatic annual for the kitchen-garden, and a perennial for variety, rising with finely divided leaves, and erect stalks from one to four or five feet, in the different species, terminated by umbels of small pentapetalous flowers.

Class and order, *Pentandria Digynia*.

Characters.] **CALYX**, umbellate flower; the general umbel long, and composed of a few rays, and the partial umbels of many, and the smaller umbellæ only have a five-leaved involucre. **COROLLA**, a deformed, radiated, general umbel, having both hermaphrodite and female florets, composed of five heart-shaped petals. **STAMINA**, five slender filaments with roundish antheræ. **PISTILLUM**, an oblong germen, two permanent styles and obtuse stigmas. **PERICARPIUM**, none; a long two-parted fruit, having two awl-shaped furrowed seeds.

There are seven, eight, or more species, one of which only is common to the English gardens, known by the name of the Garden Chervil, a fine aromatic, esteemed as a salad and soup herb. There is also a perennial sort sometimes cultivated for variety.

1. SCANDIX Cerefolium. (Annual.)

Garden Chervil.] Hath a fibrated annual root, crowned with many finely divided leaves, of an aromatic flavour, and upright stalks, one or two feet high, terminated by umbels of white flowers, with lateral umbels sitting close, succeeded by oval-awl-shaped, shining seeds.

This is an annual plant, but remains in leaf all winter, and is cultivated as a culinary herb for winter and spring service; it may also be continued for use the year round, by sowing several times from February till September, because the spring and summer sown plants run up to seed the same year, but the autumn sowing will remain green until spring before it runs.

2. SCANDIX odorata. (Perennial.)

Odoriferous, Great Perennial Chervil, or Sweet-fern.] Hath a thick, fibrated, perennial root, of a sweet aromatic taste, crowned with large divided leaves resembling fern, and upright hollow stalks, four or five feet high, terminated by large umbels of white, very fragrant flowers, succeeded by long, angular, furrowed seeds.

These plants are both very hardy; the first is an annual, and the other a perennial. The annual sort is in estimation both for salads and soups, as before observed, and the leaves are the useful part; the young leaves of the second were also sometimes used formerly, but rarely now, so is only retained in some gardens to increase the variety in the pleasure-ground, and the annual sort for the kitchen-garden only, which will grow in any soil and situation.

They run up to stalk in spring, flower in May or June, and the seeds ripen in July.

As to the culture of the Garden Chervil, it is by seed annually, observing, if it is required most part of the year, the sowing should be continued every month from February or March till August or September, as before hinted; but if required only for winter and early spring use, an autumn sowing in August, or beginning of September, will be sufficient, and the plants coming up soon after, remain useful from October till March or April. The seed may be sown any where, either broad-cast and raked in, or in shallow drills six or eight inches asunder; and in either case the plants are to remain where sown; being careful to give occasional weeding, which is all the culture they require, and they will soon be fit to cut for use.

The second may also be raised from seed; and plant out some of the plants about the large compartments; and when once thus raised, they will remain several years, and from its scattered seeds many young plants will rise in the adjacent ground.

SCHINUS, Indian Mastic-tree.

It consists of two shrubby evergreen exotics for the green-house and stove, rising eight or ten feet high, adorned with pinnated many-lobed leaves, and the branches terminated by bunches of pentapetalous flowers.

Class and order, *Diaecia Decandria*.

Characters.] **CALYX**, dioecious flowers, having monophyllous, acutely five-parted cups, that of the females being permanent. **COROLLA**, five oval petals in the males, and five oblong ones in the female flowers; those in both sexes being petiolated. **STAMINA**, ten oblong spreading segments, having roundish antheræ. **PISTILLUM**, a roundish germen,

no style, but three oval stigmas. PERICARP-
TIUM, a globular trilocular capsule, having
three seeds.

There are only two species, which being
natives of Peru, and other parts of America,
require shelter of a good green-house here in
winter, so must always be kept in pots.

1. SCHINUS *Molle*.

(*Molle*)—or *Peruvian Mastic-tree*.] Rises
with a woody stem, branching numerously
eight or ten feet high, with pinnated leaves of
ten or twelve pair of sawed lobes and an odd
one, which is much the longest; and the
branches terminated by loose bunches of whit-
ish flowers.

2. SCHINUS *Arceira*.

Brazilian Mastic-tree.] Hath a woody stem,
branching eight or ten feet high, with pin-
nated leaves of ten or twelve pair of entire
lobes, and an odd one, all of equal length;
and at the sides and ends of the branches
small clusters of whitish flowers.

Both these species are shrubby, durable in
root, and top, and retain their leaves the year
round; and being natives of hot countries, re-
quire shelter here of a good green-house in
winter; or, if sheltered in a stove, two or
three winters whilst young, it will be an ad-
vantage to the plants; however, they both suc-
ceed tolerably with the culture of common
green-house exotics. They being pretty ever-
greens, with finely pinnated leaves, merit a
place in the collection of our tender exotics,
in which they will effect a good variety; let
them, therefore, be cultivated in pots of rich
earth, and placed among the plants of the a-
bove department.

They are propagated by seed obtained from
abroad, also by layers and cuttings.

Sow the seeds, as soon as obtained, in
spring or summer, in pots of rich earth, and
plunge them in a hot-bed, managing them as
other tender seedling exotics.

Layers of the young branches in the spring
will be well rooted in one year.

And cuttings of the young shoots, planted
in the spring or summer, in pots, and plunged
in a hot-bed, will readily emit roots in six or
eight weeks.

SCHOTIA.

This genus furnishes the green-house with
an evergreen shrub, garnished with blunt-
pointed leaves, and quinquepetalous flowers.

Class and order, *Decandria Monogynia*.

Characters.] CALYX, a monophyllous co-
loured cup, the tube turbinate, and border
cut in five parts. COROLLA, five obtuse, e-
rect, concave petals, inserted in the tube of the
cup. STAMINA, ten awl-shaped, erect fla-

ments, with oblong incumbent antheræ. PIS-
TILLUM, an oblong compressed germen, style
slender and simple, obtuse stigma. PERICAR-
PIUM, a pedicillated legumen, containing two
seeds.

There is but one species, viz.

SCHOTIA *speciosa*.

Lentiscus-leaved Schotia.] Rises with a
branchy stem, furnished with pinnated leaves,
composed of three or four pair of spear-shaped,
blunt lobes, and flowers with blunt concave
petals.

This plant is an evergreen, and must be
kept in the winter in the green-house.

It is propagated by laying down the young
branches in summer.

SCILLA, Squill, or Sea-Onion, Starry
Hyacinth, &c.

This genus comprehends a fine collection of
hardy, bulbous-rooted, flowery perennials,
for adorning the flower borders, having most-
ly very large tunicated and solid bulbous roots,
crowned with long narrow leaves, and erect
flower-stalks, annually; in some sorts two or
three feet high, in others but a foot, and some
but six or eight inches, ornamented at top with
pyramidal and conic clusters of hexapetalous
starry flowers.

Class and order, *Hexandria Monogynia*.

Characters.] CALYX, no cup. COROLLA,
six oval petals, spreading out like the figure of
a star. STAMINA, six awl-shaped filaments,
crowned with oblong, incumbent antheræ.
PISTILLUM, a roundish germen, simple style,
and single stigma. PERICARPIMUM, a nearly
oval, three furrowed, trilocular, trivalved cap-
sule, containing many roundish seeds.

There are about eight species in our garden
collections, all of the bulbous-rooted tribe,
most of which are originally from distant coun-
tries, as Spain, Portugal, France, &c. except
one or two, which grow wild in some parts
of England, and all the sorts are hardy enough
to succeed in our gardens in the full ground.

1. SCILLA *maritima*.

Maritime Squill, or Common Sea Onion.] Hath a large, oval, tunicated, onion-like, bul-
bous root, sending up long narrow leaves,
near half a yard in length, and an upright
naked stalk, two or three feet high, having
the upper half adorned with a pyramidal thyrtle
of white starry flowers appearing early in
summer.

Varieties.] Red-rooted—White-rooted.

This species is a maritime plant, inhabit-
ing the sandy sea shores of Spain and other
warm countries, but the bulbs are sent here
annually for medical use, and are planted in
many gardens as flowery plants for curiosity.

2. SCIL-

2. *SCILLA Lilio-hyacinthus*.

Lily Hyacinth.] Hath a squamous, or scaly, bulbous, lily-like, yellow root, crowned with oblong lily-like leaves, half a foot long or more, and an upright slender stalk, about a foot high, terminated by many star-shaped blue flowers, appearing in June.

3. *SCILLA peruviana*.

Peruvian Starry Hyacinth, or Hyacinth of Peru.] Hath a large, oblongish, bulbous, brown root, sending up several carinated spreading leaves, six or eight inches long, broad at the base, decreasing to a point at top, and upright, thick, succulent stalks, six or eight inches high, terminated by a conical corymbose cluster of deep-blue starry flowers, appearing in May.

Variety.] With white flowers.

4. *SCILLA italica*.

Italian, Starry Hyacinth.] Hath a roundish, white, bulbous root; longish leaves with obtuse points, and erect stalks, eight or ten inches high, terminated by a hemispherical corymbus of pale-blue flowers, appearing in April.

5. *SCILLA amœna*.

Bright, Starry Hyacinth of Byzantium.] Hath a large, roundish, bulbous, purplish root, sending up several narrow, carinated, spreading leaves a foot long, and upright purplish stalks eight or ten inches high, ornamented upward with fine sky-blue, somewhat drooping flowers, rising laterally in alternate order, appearing in March or April.

6. *SCILLA bifolia*.

Two-leaved Early Star Hyacinth.] Hath a small, roundish, solid, bulbous root, sending up only two narrow leaves, about six inches long, and a slender stalk half a foot high, terminated by a few, nearly-erect, blue, starry flowers, appearing early in March.

Variety.] With white flowers.

7. *SCILLA autumnalis*.

Autumnal Squill, or English Starry Hyacinth.] Hath a round, white, bulbous root, very slender linear leaves, six inches long, and upright slender stalks, half a foot high, adorned at top with a corymbus of small, blue, starry flowers, having naked peduncles, rising over one another, the length of the flower, appearing early in September. This grows naturally in many parts of England, &c.

8. *SCILLA campanulata*.

Campanulate, or Bell-flowered, Starry Hyacinth.] Hath a roundish, solid, bulbous root, sending up slender, spear-shaped leaves, six or seven inches long, and a slender stalk, terminated by several erect, bell-shaped, spread-

ing, whitish flowers, with purple bottoms; appearing in May and June.

All these species of *Scilla* are bulbous perennials, durable in root, but annual in leaves and stalks, which rise immediately from the root: in some sorts the leaves spring up in autumn, and remain green all winter, and decay in spring, particularly the first, third, and last sort, and some others: and in some the leaves and flower-stalks appear at the same time. The stalks are generally naked or leafless, and terminated by the flowers, which consist each of six oval petals, spreading open, in a star-like manner, with great uniformity and beauty, exhibiting a good ornamental appearance; and in most of the sorts are succeeded by ripe seeds in autumn, by which all the sorts may be raised; but more expeditiously by off-sets of the roots annually, when the leaves and stalks decay.

They being all of hardy temperature, may be employed as flowery plants to adorn the pleasure ground, disposed either in patches about the borders, &c. or deposited in beds by themselves.

Observe, they should generally be removed for transplantation when their leaves and flower-stalks are decayed, when the roots may be taken up, and either planted again directly where wanted, or kept till autumn, &c. though the autumnal sort should be planted early, in order that it may blow the same year in autumn; planting all the sorts about three or four inches deep, or in proportion to the size of the bulb. See BULBUS.

The bulbs of all the sorts may be had, moderately cheap, at most of the nursery-grounds and seed-shops.

Method of Propagation, &c.

The propagation of all the sorts is by off-sets of the roots; the first species, however, being a native of sandy sea-shores, it increases but sparingly in gardens, but is obtained plentifully from abroad. All the others furnish plenty of off-sets, which may be separated every other year, if required, when their leaves, &c. decay, as practised for other bulbous roots.

They may all be propagated also by seed, though this is a tedious method, as the seedlings are several years before they blow: they should be sown in autumn, in light earth, an inch deep, observing the same method of sowing and culture practised for the Common Hyacinths. &c. See HYACINTHUS.

SCORPIURUS, Caterpillar.

The plants of this genus are hardy, herbaceous, trailing annuals, cultivated in the pleasure ground, more as plants of singularity than

than beauty, for the oddity of their caterpillar-like seed-pods; they rising with procumbent stalks, garnished with oblong simple leaves, and papilionaceous flowers, succeeded by contorted pods resembling green caterpillars.

Class and order, *Diadelphia Decandria*.

Characters.] CALYX is monophyllous, inflated, and cut into five acute segments.—COROLLA is papilionaceous; the standard roundish, emarginated, spreading, and reflexed; the wings are loose and nearly oval, and a semi-lunulated, pointed, erect keel, two-parted below. STAMINA, ten diadelphous filaments, with small antheræ. PISTILLUM, an oblong taper germen, a rising inflexed style, terminated by a punctura or point. PERICARPIUM, an oblong, coriaceous, revolute, rough pod, of many transverse cells, each containing one seed.

There are four species, natives mostly of the south of Europe, but grow freely here, in our gardens, in the open borders.

The species are,

1. *SCORPIURUS vermiculatus*.

Vermiculated, or Common Uniflorous Caterpillar.] Rises with trailing herbaceous stalks, a foot or more long, garnished with oblong spatula-shaped leaves; and at the axillas long pedunculi, each supporting one papilionaceous yellow flower, succeeded by oblong twisted pods, covered on every side with obtuse scales.

2. *SCORPIURUS muricatus*.

Muricated Biflorous Caterpillar.] Rises with thick-trailing, herbaceous stalks, a foot and half long, garnished with oblong, broad, obtuse leaves, and at their axillas long pedunculi, each sustaining two papilionaceous yellow flowers, succeeded by oblong, very twisted, rough murexed pods, having the outside armed with obtuse aculei.

3. *SCORPIURUS sulcatus*.

Sulcated Triflorous Caterpillar.] Rises with slender, trailing, herbaceous stalks, a foot long, oblong obtuse leaves, and each peduncle supporting three yellow flowers, succeeded by slender moderately-twisted pods, armed on the outside with acute distinct spines.

4. *SCORPIURUS subvillosus*.

Subvillous Quadriflorous Caterpillar.] Rises with trailing herbaceous stalks, a foot and half long, oblong, obtuse leaves, and long pedunculi, each sustaining four yellow flowers, succeeded by oblong, slender, very contorted pods, armed on the outside with sharp spines in clusters.

All these four species of *Scorpiurus* are hardy herbaceous annuals, that rise from seed annually in the spring; are all of trailing

growth, extending their stalks along upon the ground, having one leaf at each joint; and at the wings of the leaves arise the flowers, being universally papilionaceous, appearing in June and July, and are succeeded by oblong pods, variously contorted and stained, so as to bear a very great resemblance to large caterpillars, apparently feeding on the plants, effecting a curious singularity, those of the first sort in particular, which are the largest, most conspicuous, and caterpillar-like; however, all the sorts form an agreeable variety, and they all furnish plenty of ripe seeds in autumn.

These plants, therefore, merit a place in the collection of hardy annuals, principally for the singularity of their caterpillar-like seed-pods; and being disposed in patches about the borders, they will exhibit an eligible variety.

They are propagated by seed in the spring, which succeeds in the full ground, and should generally be sown in patches about the borders, where the plants are designed to remain, as they do not succeed so well by transplantation; therefore form small patches in the different compartments, sowing several seeds in each patch, half an inch deep; and when the plants are come up an inch or two high, thin them to two or three in each place, and clear out weeds, which is all the culture they require, and they will flower in June, and exhibit their pods abundantly all the latter part of summer.

SCORZONERA, Viper's Grass, but commonly called *Scorzonera*.

The plants are herbaceous perennials, biennials, and annuals, mostly of the carrot-rooted kind, one of which, in particular, producing large eatable roots, is cultivated as a kitchen-garden esculent: they rise mostly with long, narrow, grassy leaves from the root, and erect tall stalks, surmounted by large compound flowers.

Class and order, *Syngenesia Polygamia Æqualis*.

Characters.] CALYX, a long, imbricated, nearly-cylindric, general cup, containing many florets. COROLLA, a compound flower, having many tongue-shaped, quinque-dentate, imbricated, hermaphrodite florets, the outer ones being the longest. STAMINA, five short filaments, having cylindric antheræ. PISTILLUM, an oblong germen, filiform style, and two reflexed stigmas. PERICARPIUM, none, a single oblong seed in each floret, sitting on the receptacle within the connivent calyx.

There are several species, but of which there is only one cultivated for use, as an esculent and

and medical plant; the others having but little merit, their culture is not attended to, except in some botanic gardens merely for variety.

The cultivated sort therefore is,

SCORZONERA hispanica.

*Spanish Viper's Grass, or Common Scorzone-
ra.*] Hath a long, downright, carrot-shaped, eatable root, covered with a brown skin, but white and milky within, crowned with several long, narrow, entire, slightly-sawed leaves, terminating in a long acute point; and when it shoots for seed, runs up with an erect, robust, branchy stem, a yard or more high, garnished with amplexicaulous leaves, like the lower ones, and all the branches terminated by large, compound, bright-yellow flowers.

The root is the useful part, being in perfection in autumn and winter, and is boiled and eaten like carrots, &c. and is by many greatly esteemed.

This species, though of a perennial nature in the root, yet, for general use, it should be commonly treated as an annual or biennial; for, being raised from seed in the spring, the roots will be fit for use in the following autumn, and remain in perfection till next spring, when they will shoot up stalks for flower and seed, and become hard, sticky, and unfit for use, so should be thrown away, and a fresh supply raised from seed.

The general propagation of this plant is by seed annually, in any open light spot of ground, sown the latter end of March or beginning of April, not earlier, lest the plants fly up to seed the same year, before the roots acquire perfection: having, therefore, made choice of an open spot of ground in the kitchen-garden, and at the proper season digged it one good spade deep at least, then let the seed be sown, either broad-cast, all over the surface, thinly, and raked in, or may draw shallow drills, ten or twelve inches asunder, and sow the seeds therein, and rake the mould evenly over them half an inch thick; in either method the plants will rise in two or three weeks; observing, when they are a little advanced in growth, let them be thinned and cleaned from weeds, by small-hoeing them in dry weather, cutting out the plants to eight or ten inches distance, and cut down all weeds between them; thus they will grow freely, and their roots continue increasing in size till September, when they will have acquired their full size, discoverable by their leaves beginning to decay; at which token of maturity, may begin to draw them for use.

The roots may either remain in the ground, and drawn as they are wanted, or may be taken wholly up in autumn, when their leaves decay, and preserved in sand all winter, that

they may be ready at all times, especially in frosty weather, when they cannot be dug out of the ground.

To save seed of this species, let some of the plants remain where sown, when they will shoot up in the spring, and produce plenty of seed in autumn.

SCROPHULARIA, Fig-wort.

This genus comprehends perennial, fibrous-rooted, herbaceous, and shrubby plants, some of which are retained in our gardens for ornamental flowering, and variety, in the pleasure-ground and green-house; growing three or four to five or six feet high, garnished with trifoliate, pinnated, and spear-shaped leaves, in different species; and monopetalous, tubular, inflated, red flowers, axillary and terminal.

Class and order, *Didynamia Angiospermia.*

Characters.] **CALYX**, a monophyllous, quinquefid, permanent cup. **COROLLA**, monopetalous, and unequal; the tube round, large, and inflated; the border is five-parted and small, the two superior segments, erect, and larger, the two lateral spreading, and the lower reflexed. **STAMINA**, two longer, and two short, linear, declining filaments, topped with twin antheræ. **PISTILLUM**, an oval germen, with a simple style and stigma. **PERICARPIUM**, a roundish-pointed, two-celled capsule, containing many small seeds.

There are many species: those for our purpose are,

1. *SCROPHULARIA trifoliata.*

Trifoliate African Figwort.] Hath a perennial root, smooth leaves, the lower ones irregularly cut, trifoliate-pinnated, upright stalks, four feet high; garnished with simple, oval, or trilobate leaves, and axillary peduncles, sustaining bright red flowers with greenish bottoms.

2. *SCROPHULARIA sambucifolia.*

Sambucus-leaved Spanish Figwort.] Hath a perennial root, upright stalks, five or six feet high, garnished with interruptedly pinnated leaves, of five or seven cordate, unequal folioles, and axillary and terminal red and greenish flowers.

3. *SCROPHULARIA frutescens.*

Undershrubby Lusitanian Figwort.] Hath ligneous, undershrubby stalks and branches, lanceolate, obtusely-dentated, serrated leaves, and bifid peduncles, with greenish flowers.

4. *SCROPHULARIA lucida.*

Lucid, or Shining-leaved Figwort.

5. *SCROPHULARIA aquatica.*

Aquatic, Striped-leaved Figwort.

The above five are the principal species of *Scrophularia* retained in our gardens, introduced for ornament and variety; are mostly exotics, originally from warm countries, A-

frica, Spain, and Portugal, &c. they, however, being tolerably hardy, to stand our ordinary or moderate winters, are cultivated in the borders of the pleasure-garden; and some also in pots, in order for removing under the protection of a green-house in winter, to defend them from severe frost, by which they are liable to suffer in the full ground.

They are propagated by seeds sown in the spring, and also by parting their roots in the same season, or in autumn; the shrubby sorts likewise by cuttings or slips in the spring or summer months.

SCUTELLARIA, Skull-cap.

A genus of hardy, perennial, herbaceous plants, garnished for the most part with cordate leaves and ringent flowers.

Class and order, *Didynamia Gymnospermia*.

Characters.] CALYX, a very short, tubulated, one-leaved cup, with the mouth entire. COROLLA, monopetalous, and ringent; the tube is very short and bent backward, the throat is long, and compressed, the upper lip concave, and trifid, and the lower broad and emarginated. STAMINA, four filaments, two of which are longer, with small antheræ. PISTILLUM, a four-parted germen, style slender, and crowned with a pointed incurved stigma. PERICARPIUM, none; but the cup becomes a helmet-shaped fruit, containing four roundish seeds.

There are several species of this genus, but not more than three are commonly cultivated for variety and ornament.

1. SCUTELLARIA *altissima*.

Tall Skull-cap.] Hath a perennial root, the stalks rise three or four feet high, with a few slender branches, garnished with oblong, heart-shaped, serrated, pointed leaves. The flowers are purple, and come out at the top of the stalks, in naked spikes.

2. SCUTELLARIA *peregrina*.

Florentine Skull-cap.] Hath a perennial root, the stalk is four-cornered, hairy, rising two feet high, and garnished with heart-shaped, serrated leaves; the flowers come out in a long spike at the top of the stalks, and are either of a purple or white colour.

3. SCUTELLARIA *integrifolia*.

Entire-leaved Skull-cap.] Hath a perennial root, from which rises several four-cornered stalks, two feet high, with side branches; the lower leaves are heart-shaped, sawed on their edges, and the upper ones are oval and entire; the flowers are of a blue colour, and come out from the ends of the branches in long loose spikes.

The propagation of these plants is by seeds, sown either in autumn or spring, in the com-

mon ground where they are to remain, or may afterwards be transplanted into the borders of the pleasure-garden.

SEDUM, Lesser House-leek, Orpine, and Stone-crop.

This genus is composed principally of hardy herbaceous succulents for variety, rising with annual flower-stalks, some erect, a foot or two high, some but a few inches, and some are of trailing growth; adorned with fleshy leaves, and terminated with bunches of pentapetalous flowers.

Class and order, *Decandria Pentagynia*.

Characters.] CALYX is erect, acute, five-parted, and permanent. COROLLA, five spear-shaped, plane, spreading petals, and five nectariums, formed each of one emarginated scale, inserted in the outside of the germen. STAMINA, ten awl-shaped filaments, having roundish antheræ. PISTILLUM, five oblong germens, terminating in slender styles, crowned by obtuse stigmas. PERICARPIUM, five acuminate spreading capsules, opening longitudinally, and are filled with many small seeds.

There are many species of *Sedum*, consisting of herbaceous perennials and annuals, inhabitants mostly of dry sterile places, as hills, rocks, and tops of walls and buildings; and of which several of the perennials are retained in gardens for variety, and some as medical plants, most of which are succulent both in stalks and leaves, some rising with erect stalks half a yard high, others not six inches, and some trail along the ground, as above hinted, and consists both of deciduous and evergreen plants.

The most noted species are,

1. SEDUM *Telephium*.

Common Greater Orpine, or Livelong.]

Hath a perennial root, composed of many knobbed tubercles, sending up erect, round, succulent stalks, branching half a yard or two feet high, garnished with oblong, plane, serrated, succulent leaves, and the stalks terminated by a leafy corymbus of flowers, of different colours in the varieties.

Varieties.] Purple-flowered Orpine — White-flowered — Broad-leaved — Greater Sedum Orpine.

This species is an inhabitant of woods and dry places in England, &c. but has been long a resident of gardens for variety and medical use: considered as a medicinal plant, it has great virtue in easing pains both of green wounds and old sores, the leaves being peeled or bruised, and applied to the part affected; and it is said they will also cure corns.

There is a singularity in this plant, that the stalks being cut in summer, and fastened upright

right in a room, they, by their succulency, will continue shooting a long time, only by sprinkling them with water once a week.

2. *SEDUM Anacampseros*.

(*Anacampseros minor*)—*Lesser Orpine*, or *Ever-green Lesser House-leek*.] Hath a fibrous perennial root, decumbent or trailing stalks, roundish-wedge-shaped entire leaves, and the stalks terminated by a corymbus of purple flowers.

3. *SEDUM rupestre*.

Rock Sedum, or *Stone-crop of St. Vincent's Rock*.] Hath slender, trailing, purple stalks; short, thick, awl-shaped, succulent, glaucous leaves in clusters, quinquenariouly imbricated round the stalks, and the stalks terminated by roundish, cymose bunches of bright-yellow flowers.

It grows naturally on St. Vincent's Rock near Bristol, and other rocky places in Europe.

4. *SEDUM Aizoon*.

Aizoon, or *Siberian Yellow Orpine*.] Hath a tuberculated, fibrous, perennial root; many upright, round, succulent stalks, a foot high; lanceolate, plane, serrated, thickish leaves; and the stalks terminated by a close-fitting, cymose cluster of bright-yellow flowers.

5. *SEDUM reflexum*.

Reflexed, Small Yellow Sedum, or *Wall Orpine*.] Hath a slender, fibrous, perennial root; small, trailing, succulent stalks, garnished with thick, awl-shaped, succulent leaves sparsely, the lower ones recurved, and the stalks terminated by reflexed spikes of bright-yellow flowers.

It grows naturally on old walls and buildings in England, &c.

6. *SEDUM acre*.

Acrid, Minute Sedum, *Common Stone-crop of the Wall*, or *Wall Pepper*.] Hath a small fibry root, very slender succulent shoots, of very low spreading tufty growth, very small, sub-oval, gibbous, erect, alternate leaves, close together; and the stalks terminated by trifid cymose bunches of small yellow flowers.

This sort grows abundantly on rocks, old walls, and tops of low buildings, almost everywhere, which often appear covered with the flowers in summer: it merits culture in pots of rubbishy earth, and in patches in dry borders, stony banks, and in rock-work, or on tops of walls, sheds, &c. where it will increase into large tufts, and exhibit a pretty variety both in its green tufty growth, and when in flower.

Its leaves, &c. are of an acrid biting quality.

7. *SEDUM sexangulare*.

Sexangular Stone-crop.] Hath a fibry per-

ennial root; thick, short, succulent stalks; small, sub-oval, gibbous, erect leaves, close together, arranged six ways imbricatum, and the stalks terminated by bunches of yellow flowers.

It grows on rocky and other dry places in England, &c.

8. *SEDUM album*.

White Stone-crop.] Hath fibry perennial roots; trailing slender stalks, six or eight inches long; oblong, obtuse, sessile, spreading leaves; and the stalks terminated by branchy cymose bunches of white flowers.

This grows on old walls, rocks, and buildings in England, &c.

9. *SEDUM hispanicum*.

Spanish Sedum.] Hath fibrous perennial roots, crowned with clusters of cylindric, acute, succulent leaves; slender succulent stalks, four or five inches high, garnished also with cylindric leaves, and terminated by downy cymose clusters of white flowers.

10. *SEDUM stellatum*.

Starry Italian White Sedum.] Hath succulent leaves, planish-angled, and lateral sessile, white flowers, placed solitary.

11. *SEDUM libanoticum*.

Libanotic Sedum of Palestine.] Grows with bundled radical leaves, which are spatulate-lance-shaped; and with a naked stem, terminated at top by the flowers.

12. *SEDUM populifolium*.

Poplar-leaved Siberian Stone-crop.] Hath a shrubby stalk rising a foot high, garnished with plane, heart-shaped, dentated leaves on petioles, changing with the stalks to a reddish colour, placed alternately, and deciduous; the flowers are of a pale red, and come out at the ends of the branches in a corymbus. This is a native of Siberia and hardy.

Of the above twelve species of *Sedum*, the first eight or ten sorts are the most noted and generally known in our gardens; though all the sorts are occasionally cultivated in general collections to increase the variety: there are also some annual species occasionally cultivated; the most material of which are known by the following names.

13. *SEDUM annuum*. — Annual, Northern White Sedum.

14. *SEDUM dasphyllum*. — Dense-leaved Sedum.

15. *SEDUM rubens*. — Reddish or Blushing Sedum.

16. *SEDUM Cypæa*. — Purslane-leaved, White Sedum.

Of the above collection of *Sedums*, all the perennial kinds particularly have the greatest claim to admittance in our garden compart-

ments for variety and diversity, in their various different modes and sizes of growth, and various foliage, and different orders of flowering; and are eligible to introduce as flowering perennials for ornament in assemblage, in borders, beds, pots, &c. and some also as medicinal plants, such as the orpines, &c.

The first twelve species, being the principal sorts for our garden collections, are all herbaceous succulent perennials, mostly of hardy growth; all durable in root, but mostly annual in stalk, &c. which rising in spring and summer, advance to flowering in June, July, and August, in the different sorts; the flowers, consisting each of five small petals, crown the stalks numerously in corymbose and cymose bunches and spikes, very conspicuously; and are succeeded by plenty of seeds in autumn, by which they may be propagated; also abundantly by parting the roots, and by slips or cuttings of the shoots in spring and summer; in all of which methods they readily grow, and spread into tufted bunches.

They being all of succulent growth, are consequently most inclinable to affect a more prosperous durable growth on dry soils.

For most of these plants, in their native state, are residents of dry barren situations, sides and bottoms of mountains, rocks, &c. in different parts of Europe and Asia; and some grow spontaneously and abundant upon old walls, and the roofs of low old buildings in England, &c. particularly the common Stone-crops; so that all the sorts of these plants, in their culture in gardens, should generally have a dry light soil; in which they are always the most durable, both in the full ground, in borders, sides of banks, and in pots; and will also grow durably in any dry rubbishy earth; and some sorts also upon walls, and rock-work, and other similar situations.

Considered as garden plants, they merit estimation principally for variety and ornamental flowering, in which they will have an agreeable effect, in their different dimensions and orders of growth, some upright a foot or two high in their flower-stems, some procumbent, and trailing, and others curiously diminutive, spreading in a tufted growth; and with larger, smaller, and minute foliage in the different species; and their flowers, although separately small, some very minute, being produced numerously in their different modes of inflorescence, before observed, they appear conspicuous and very pretty in the summer from May or June till August or September, in the different species, purple, white, yellow, &c.

Most of the perennial sorts may be obtained at the nurseries in full plants, for planting as

required, in borders, pots, &c. either in the spring, for flowering the same year, or in autumn to flower the year following.

They may be planted in any of the spring and early summer months, March, April, May, and in autumn, August, September, October.

They may be planted in any dryish, light soil, in borders, beds, and other compartments, and in the sides of dry banks, or in any elevated rubbishy soil; and some in pots to move to different parts occasionally, or also some of the evergreen kinds, to introduce in their said pots among winter plants under shelter in that season, to increase the variety: and in all of which they may be planted either in full plants, or tolerably full off-set slips of the root and head together, in spring or autumn aforesaid, or most of them by cuttings of the young shoots in spring or summer, they will all readily grow, and increase plentifully according to their respective growths.

They, in most sorts, may also be introduced as rock plants, to embellish artificial rock-work, ruins, and other similar places in pleasure-grounds; planting either the rooted plants, slips thereof, or cuttings of the shoots, in any stiff, moist soil, a little to each plant or set, at first, and thus placed in the crevices, &c. in different parts; the plants will soon root therein, fix themselves, and advance in a spreading growth very agreeably; and the Stone-crops and other low trailing kinds may also be made to occupy the tops of any low walls, pent-house, shed, or other low building, planting them as above, in a little moist soil, or clumps of stiff mud, previously placed on the wall, &c. they will most readily root, establish themselves, and branch out thickly-spreading in their peculiar close, low, tufty growth, without further trouble.

Likewise the Stone-crops, *Sedum acre*, and *Sedum sexangulare*, being diminutive tufty plants, may be disposed in patches towards the fronts of borders, &c. they will spread thick and tufty close to the ground, and flower abundantly; and these sorts being planted in pots, as is much practised about London, are proper to place in the outside of windows, copings of low walls, and in balconies, and court yards, in assemblage with other low fancy plants; they will closely overspread the surface, and flower profusely as far as they extend.

Method of Propagation for all the Sorts.

All the sorts are easily propagated by slipping the roots, at almost any time of the year; likewise by slips or cuttings of their shoots in spring and summer, particularly the stalky and running kinds; but slips and cuttings of all the sorts

sorts will very readily grow; and as to the Stone-crop kinds, shoots of them may be easily slipped in spring and summer with roots to their bottom; the same may also be often practised to most of the other species: observing, in all the methods of propagation, the slips and cuttings may either be planted in the nursery way till well rooted, or planted at once where they are to remain, in the places and manner before mentioned.

They may also be propagated by seeds sown in any dry soil, or in the crevices of buildings, &c.

The annual sorts are also propagated by seeds in the spring, March or April, in beds or borders of dry light earth.

SELAGO. (*Selago*.)

For the green-house, this genus furnishes three species of ligneous, under-shrubby and shrubby, African exotics; rising with slender stems and branches, three or four to six or seven feet high; garnished with slender, thread-form, and narrow linear leaves in radiated bunches, and verticillate circles; and quinquefid spreading flowers, in terminal corymbose clusters and spikes: having quadrifid permanent calyxes, monopetalous corolla, five-parted above, and spreading; two long and two shorter stamina; a roundish germen, and single stigma, succeeded by a single seed involved in the corolla.

Class and order, *Didynamia Angiospermia*.

The species are,

1. SELAGO *corymbosa*.

Corymbous-flowering Selago.] Rises with ligneous under-shrubby stalks, and spreading branches; filiform or thread-shaped leaves in radiated bunches from the same point; and multipart corymbose clusters of pure-white flowers.

2. SELAGO *pinastra*.

Pinaster-leaved Selago.] Rises with shrubby stalks, and alternate erect branches, garnished with long linear leaves in whorls, and hairy corymbose spikes of flowers.

3. SELAGO *spuria*.

Spurious Selago.] Rises with shrubby stalks, garnished with linear denticulated leaves; and corymbose spikes of flowers.

These three species of *Selago* are the principal sorts known in our gardens, but more generally the first and second: though all the sorts effect a curious variety in assemblage among the other green-house exotics, in which they must be admitted, and have the same general culture summer and winter.

They are propagated by layers of the young wood in spring or summer; also by cuttings of the young shoots in the same seasons, in a hot-bed, or covered down close with a hand-glass.

SEMEN, the Seed, being the essence of the fruit of every vegetable, containing the future plant in miniature, and consists of the following essential parts.

Corculum, or Punctum Vitæ. The little heart, the point of life, or embryo of the future vegetable, being the small point or speck, placed in the centre of the Seed, between the cotyledons or lobes, and attached thereto, and is distinctly visible in the bean and most other leguminous seeds: consists of two parts, the *rostellum* and *plumula*, the former being the radical or descending part that strikes downwards, and becomes the root; the other is the ascending part, that shoots upward, and become the stem and branches, &c.

Cotyledon or Side Lobes. Being the side perishable lobes of the seed, which involve, and for some time nourish the *corculum* or embryo plant: these lobes are generally two in number, very conspicuous in the bean and other seeds of the leguminous tribe, particularly if they have been previously laid in earth or water.

After the seeds have been committed to the earth, the *corculum* or *punctum vitæ* begins to germinate, and the cotyledons expand, burst open the outer cover, and rise gradually out of the earth in form of leaves, commonly called the Seed-leaves, exhibiting the first visible formation of the infant plant, accompanying it for some time after its eruption from the earth, till the first proper leaves are formed in the centre of the vegetable, and advanced a little in growth; then the lobes or seminal leaves becoming useless, wither and decay.

Most plants have two cotyledons or Seed-leaves (*Dicotyledones*), particularly almost all the tribe of fibrous-rooted herbaceous plants, and all trees and shrubs; but some have only one cotyledon (*Monocotyledones*), as in most of the bulbous plants of the liliaceous tribe, rising out of the ground like a sheath; and some seeds have no cotyledon at all (*Acotyledones*), such as the ferns, mosses, flags, and fungi.

Other parts of the Seed are,

Ala or Wing. Many Seeds are winged, or furnished with a thin membrane or film, and, by its flying, helps to disperse them, as in fir, birch, maple, ash, elm, hops, and numerous other sorts.

Coronilla or Little Crown. Many Seeds are crowned, and some surrounded with a pappus, i. e. a feathery or hairy down, particularly many of the compound tribe and others, for the purpose of dissemination; being framed for flying like a shuttlecock, so as to be easily transported by the wind to very considerable distances.

distances from the parent plant ; hawk-weed, groundsel, and dandelion, furnish examples.

But numerous sorts of Seeds are simple, i. e. have neither wing nor pappus.

The number, form, size, and substance of Seeds are extremely various in different plants.

In point of number, it consists of from one to several hundred, or even thousands, in each seed vessel ; for some plants have only one, some two, three, four, or many Seeds, and some are of amazing fertility, amounting to many hundreds ; as for instance, a single Seed-vessel of tobacco often contains about one thousand Seeds ; that of white poppy, eight thousand : and the whole produce of one tobacco plant is upwards of forty thousand, though some have computed the number above three hundred thousand ; and the produce of a single stalk of spleen-wort is estimated at upwards of a million of Seeds.

As to form, Seeds are either round, oval, kidney-shaped, heart-shaped, angular, &c.

With respect to size, Seeds are of numerous sizes in different plants, from the large size of cocoa nuts down to the minute seeds of cresses, mosses, and others much smaller.

And as to substance, some Seeds are soft or fleshy, some membranous, and some are of a hard bony nature, as in all the nuciferous tribe, and the stones of many sorts of berries, and other stone fruit.

Seeds are covered or naked. Covered Seeds (*Angiospermia*) are such as are contained in some vessel, either of the capsule, pod, berry, apple, or cherry kind : and naked Seeds (*Gymnospermia*) are those that are not contained in any vessel, but lodged in the receptacle, or in the bottom of the calyx.

The vast variety of ways nature has provided for the dissemination of seeds is truly wonderful ; in most plants, the fruit or vessels containing the seed are raised above the ground either by erect firm stems, or often by climbing stalks, so that the fruit being elevated from the ground, it may be more easily shaken by the wind, which often blows Seeds to a great distance ; for the same reason that species of seed-vessel called a capsule opens at the top, that the Seeds may be more easily disseminated. Many Seeds being winged, as before observed, are by that means spread far and near by the winds ; these wings consisting either of a thin membrane or film, as in the fir, birch, maple, elm, ash, hops, &c. as formerly hinted ; or of a fine feather-like or hairy down, beard, or tail, as in most of the compound plants, also in the scabious, valerian, and many others, whereby they are easily waisted to a great distance to different

soils and territories. Some seed-vessels are endued with a remarkable elasticity, by which means they dart their Seed, with an elastic force, to some considerable distance, such as touch-me-not, and spiriting cucumber, &c. Many Seeds and seed-vessels being armed with hooks, hairs, &c. by which they attach themselves to animals, and are thereby dispersed, such as in carrot, hemp agrimony, burdock, &c. Likewise Seeds of many sorts being devoured by birds, they void them entire, often in different parts at a distance, and they grow. Berries, and other pulpy fruit, being eaten as food, the Seeds or kernels of many sorts often pass through unhurt, and falling to the ground often grow. Seeds are also often disseminated by rivers, torrents and all running waters and tides, hence often conveyed many hundred leagues from their native soil, and cast upon a very different climate, to which, however, they sometimes, by degrees, render themselves familiar.

The duration of Seeds, in respect to the retention of their germinative property, is very considerable ; for instance, the cucumber, melon, and gourd, often retain their vegetative power eight, ten, or twelve years ; and it is said, the *mimosa* or sensitive plant will retain the principle of life thirty or forty years ; on the other hand, the greater number of seeds will not keep good above one or two years, and many, or the greater part will not grow well if more than one year old ; and some Seeds require to be sown soon after they are ripe, or they will not grow till the second year ; others, unless sown soon after they are gathered, will not grow at all, as is often the case with the coffee-berries. It is however observable, of almost all sorts of Seeds, that being sown the first year, they generally rise sooner and stronger than older Seeds ; for which reason it is advisable to chuse principally new Seeds, not more than one year old, if possible, of all sorts of plants and trees, only a few excepted, such as cucumbers and melons in particular, of which, Seeds of two or three years old, or more, are often preferable, because plants raised from new Seed are apt to run vigorously to stem without either becoming tolerably soon fruitful, or producing much fruit.

All Seeds produced in dry capsules, pods, and other dry Seed-vessels, keep much longer in their said vessels than if taken out ; though it is probable that most Seeds will retain their germinative faculty longest in the bowels of the earth, when they have been accidentally buried a considerable depth out of the reach of the influence of the sun and

and air. And it has been observed of corn-fallad in particular, which by accident have been buried three feet deep in the ground thirty years, and the soil being turned up that depth to the top, they have grown freely; the same has also been observed of many other Seeds, which by chance have been immersed in the ground several feet deep; and in the bottom of wells, vaults, ponds, and ditches, that have not been stirred for many years, as may be judged from circumstances; for when occasion required the soil to be thrown to the top, and exposed to the sun and air, many plants have risen that had not been remembered to have been seen thereabouts before, or at least for many years past.

Likewise most sorts of Seeds, if sown too deep, remain inactive, and some never grow at all; others, nevertheless, preserve their growing property; and when the ground is again fresh stirred, such of the Seeds as happen to be moved nearer the surface will often come up; which shows the power of the sun and free air in promoting vegetation in Seeds and plants.

Seeds, therefore, should never be sown too deep, and always in proportion to their size; from about a quarter, or half an inch deep, for the smaller Seeds, to about one or two inches for the middling and large kinds of Seeds. See SOWING OF SEEDS.

The germination or growth of Seeds, after being regularly sown or committed to the earth a proper depth, is in some sorts very quick, and others slow; as for instance, cresses, mustard, turnep, and many others, come up in a few days; some other sorts in one, two, or three weeks, as in most of the esculents of the kitchen-garden, and numerous others of the herbaceous tribe; though parsley, and some others, often remain inactive a month or six weeks, and some sorts lie a year or two in the ground before they germinate. As to the tree and shrub Seeds, some will rise in a month or six weeks, or less time, others require two or three months to vegetate, and some sorts lie a whole year at least before they begin to grow, such as the hawthorn, holly, and most others of the very hard bony-seeded kinds; all of which, both in the herbaceous and woody tribe, is generally hinted in the culture of the respective sorts under their proper genera. See also GERMINATION.

For particulars in regard to the various methods of sowing of Seeds, see SOWING OF SEEDS.

SEMPERVIVUM, (Ever-living) Live-ever, or Common House-leek, &c.

The plants are of the succulent tribe, herbaceous and shrubby, consisting of low, hardy, herbaceous, evergreen perennials, for variety in the pleasure ground, &c. and medical uses, and shrubby ever-green succulents for the green-house collection, adorned with roundish and oblong, thick, fleshy, succulent leaves all the year, and the stalks terminated by bunches of polypetalous flowers.

Class and order, *Dodecandria Dodecagynia*.

Characters.] CALYX is concave, cut into many acute segments, and permanent. COROLLA, from six to ten or twelve oblong, spear-shaped, acute, concave petals. STAMINA, twelve awl-shaped filaments, with roundish antheræ. PISTILLUM, twelve germina, placed circularly, terminating in the like number of spreading styles, crowned with acute stigmas. PERICARPIUM, about twelve oblong, compressed, circularly-placed capsules, pointed outward and opening on the inside, filled with many small roundish seeds.

There are about six species retained in our gardens for variety and ornament; four of which are hardy herbaceous plants, and two are shrubby succulent exotics for the green-house.

Hardy Herbaceous kinds.

They are low herbaceous ever-greens, with succulent leafy heads close to the crown of the root, sending up flower-stalks annually, in some a foot high, others not half so much; one sort (*Common House-leek*) grows naturally in England, &c. on buildings, or barren hills, the others in mountainous parts on the continent of Europe, but are all hardy enough to grow here, any where either in the full ground or in pots, or on tops of walls, buildings, or rock-work, &c.

I. *SEMPERVIVUM tetlorum*.

Common House-leek.] Hath a fibrous perennial root, crowned with many ovalish, pointed, ciliated, succulent leaves, in roundish heads, close to the earth, having many spreading off-sets; and upright, round, succulent, reddish stalks a foot high, terminated by reflexed spikes of spreading red flowers, in July and August.

This is the Common House-leek, which grows naturally on barren hills, and tops of old buildings, walls, &c. in England, and most countries in Europe; and we may see it growing in tufts on the tops of sheds, and other low buildings, almost every where, with hardly any soil in which to root; for the off-sets being planted at first

in a little lump of any soil, and placed on the tiles or thatch of any building, or on the coping of a wall, they will readily strike, and multiply into large bunches without any culture.

This species, being of a very cooling quality, is used against the St. Anthony's fire, shingles, burns, scalds, and inflammations, &c.

2. *SEMPERVIVUM globiferum.*

Globiferous Siberian House-leek.] Hath a fibrous root, crowned with numerous oblong-oval, succulent, ciliated leaves in compact globular heads, producing many globular off-sets; and erect, round, succulent stalks, six or eight inches high, terminated by yellowish flowers.

Variety.] With red flowers.

This species produce numerous small globular off-sets, which being thrust off by the larger heads, and falling on the ground, &c. take root freely of themselves, and become proper plants.

3. *SEMPERVIVUM arachnoideum.*

Cob-web, Smaller House-leek, commonly called Cob-web Sedum.] Hath fibrous roots, crowned with short, narrow, succulent leaves in small heads, having many hair-like threads, intersecting one another, from leaf to leaf, resembling a spider's web; and erect, round, succulent stalks, six inches high, terminated by spikes of bright red flowers ranged mostly along one side.

4. *SEMPERVIVUM montanum.*

Mountain Helvetican House-leek.] Hath fibrous roots, crowned with oblongish, pointed, ciliated, succulent, smooth leaves, in expanded open heads, producing very spreading off-sets; and erect succulent stalks, eight or ten inches high, terminated by spikes of deep-red flowers.

All these herbaceous *Sempervivums* are very hardy evergreen perennials, formed of roundish clusters of succulent leaves close to the ground, &c. remaining green all the year, and from the centre of the heads of leaves arise the flower-stalks annually, flowering mostly in July and August, succeeded by ripe seeds in Autumn.

They are all hardy enough to grow any where in dry light ground, rubbishy banks, or in pots, and the tops of buildings, rock-work, &c. as before intimated.

The smallest off-set, being planted in a small portion of any soil, will grow and increase exceedingly.

Tender shrubby kinds.

These consist of two shrubby succulent exotics, with strong erect stems, terminated by heads of numerous succulent leaves, and

large spikes of flowers; and being natives of hot countries, require shelter of a green-house here in winter.

5. *SEMPERVIVUM arboreum.*

Tree House-leek, or Tree Sedum.] Rises with an upright, thick, fleshy, tree-like, smooth, branching stem, six or eight feet high, with the branches terminated by large clustering heads of spear-shaped, bright-green leaves; and, from the centre of the heads, large pyramidal spikes of bright-yellow flowers, in autumn and winter.

Varieties.] Variegated-leaved Tree House-leek, which is a very curious variety of a fine ornamental appearance — White-flowered. Both the varieties flower very ornamentally, and the flowers continue long in beauty.

It is a native of Portugal, Crete, and the Cape of Good Hope.

6. *SEMPERVIVUM canariense.*

Canary Shrubby House-leek.] Rises with an upright, succulent, rough stalk, half a yard or more high, appearing rugged with the rudiments of past foliage, having the top crowned by large globular heads of retuse succulent leaves; and from the centre of the head a long pyramidal spike of greenish flowers, in June and July.

All the above six species of *Sempervivum* retain their leaves the year round, which, in all the sorts, are thick, fleshy, and succulent, and generally collected many together into round heads; and from the centre of the head arises the peduncle or flower-stalk, terminated by the flowers in summer and autumn, each flower composed of from about eight or ten to twelve petals, spreading out every way in a star-like manner, exhibiting a good ornamental appearance, and are succeeded by ripe seeds in autumn.

All the sorts being of a very succulent nature, are the most prosperous and durable in the driest light soils; and the hardy sorts, in particular, will also grow on walls, tops of low buildings, and rock work; being planted in a little clump of stiff mud or earth placed on walls, &c. they will readily grow; but the two shrubby kinds being tender, must be always kept in pots, to place in a green-house in winter: it is also proper to pot some of the smaller curious sorts of House-leeks occasionally, both as being of diminutive growth, not conspicuous when planted in the borders, &c. and to preserve them in a green-house or frame in winter, to continue them of a more lively state in that season, than those fully exposed.

However, the first four species are mostly hardy plants, all of herbaceous perennial growth, and will succeed almost any where in

in the full air all the year, in any dry raised borders, banks, or pots; or most of them upon walls and the roofs of any low building, shed, or hovel, &c. all of which, in their general growth, spread close to the earth, increasing in many collected heads of succulent fleshy leaves larger and of the most spreading growth in the first sort, Common House-leek; smaller in the second species, but curious in its globular propagina or off-set heads, emitted abundantly on every side; but the third is a diminutive plant, of curious singularity in its arachnoideous resemblance, formed by the interwoven hairs of the leaves; and being of minimous growth, some plants are generally kept in small pots as a peculiar curiosity; and the fourth sort, a plant of larger dimensions, although less known than most of the others, is equally deserving of admittance in the collection, as it forms a good variety in its expanded heads, spreading off-sets, and spikes of red flowers; the whole propagating freely by the abundant off-set heads, which being detached and planted, will most readily grow of several years continuance, remaining always green, and most of them will flower annually.

Of the above species, the common House-leeks are noted almost every where, for their remarkable singularity, in growing on the roofs of low cottages, barns, sheds, pent-houses, &c. and tops of walls, with scarcely any soil to grow in, but supported apparently by their own natural succulency: being retained both in situations as above, as occasional medical plants, and in gardens, for variety. But all the sorts are eligible to introduce for variety, and as flowering plants: some larger kinds disposed towards the front of dry raised borders, and others, of the different sorts, in pots, &c. but as being succulent replete with humidity, they should generally have a dry light soil in any raised borders, sloping banks, &c. and in pots of light, dry, sandy, or rubbishy earth, as they will succeed in any kind of dry rubbishy soil; and any of the larger sorts may also be placed upon walls or low buildings, in small clumps of any stiff soil for them to strike into at first, or also upon any kind of rock-work, &c. in all of which situations, they will succeed in a free growth; for as they increase exceedingly by their off-set heads, and these being detached or slipped at almost any time in spring, summer, or autumn, and planted as above, they will soon strike root, grow and multiply into clustered heads, as may be observed of the common House-leeks, continue for years, and flower in summer very agreeably.

However, it is also proper to plant some of

the different sorts in pots, for moving to any compartments occasionally; or more particularly the *globiferum* and *arachnoideum*; the former for the curiosity of its numerous surrounding progeny of globular off-sets, hence is frequently called Hen-and-chicken House-leek; and the latter, Cob-web Sedum, or smaller House-leek, as being curious in its diminutive growth, and interwoven hairs, as before observed; planting each sort separate, in middling, smallish, or small pots, according to the size of the different species; filling the pots with dry light compost, and set one plant in each pot, giving a little water just to settle the earth about the root; and being thus potted, they are ready to remove to any place required for variety; and the smaller sorts under shelter of a garden frame, or green-house in winter, both to preserve them more effectually in a lively state, and to effect a variety in that season among other sheltered small evergreen plants.

The two tender shrubby sorts, requiring constant shelter in winter, must be kept in pots of light sandy earth, or any dry rubbishy soil, and placed among the green-house plants, where they will exhibit a conspicuous variety at all times of the year; but more eminently the *Sempervivum arborcum* and variety, managing them as other succulents of the green-house collection, being particularly careful to water them but sparingly in the winter, as too much moisture is destructive of tender succulents in that season. See GREEN-HOUSE PLANTS.

Method of Propagation, &c.

All the four herbaceous *Sempervivums* are very expeditiously propagated by their off-set heads, which may be readily slipped off with roots, or even if without immediate root fibres, they will succeed; planting them in any light dry soil, or rubbish, as before observed; and if on buildings or rock-work, &c. lay a little mud or stiff soil thereon in patches, in which plant the slips, and they will grow and flourish without farther trouble.

The two green-house kinds are propagated by cuttings of the branches and by seed.

By Cuttings.—The first of these two sorts in particular is easily propagated by cuttings of the smaller branches, any time from April or May till July, either with or without the aid of hot-beds, though, if planted early, they may be greatly forwarded by the assistance of artificial heat; however, in any of the summer months they will readily take root in a bed, or pots of natural earth, in the open air; observing in taking off the cuttings, if they appear very succulent in the cut part, it is eligible to lay them in the dry a few days to skin over, previous to planting; then

either plant them in pots of dry light soil, or in a bed of common light earth till rooted; in either method allow them occasional shade from the sun, and sometimes moderately watered in very dry weather, especially those in pots; they will thus be well rooted in two or three months, and may then be potted separately in the middling pots, and placed among the other green-house exotics.

By Seed.—The Canary House-leek, in particular, producing seed in tolerable plenty in our gardens, may also be propagated by sowing the seed in autumn, or early in spring, in pots of light earth, placing them in a frame to have shelter from frost, but exposed in mild weather; and as the warm season advances the plants will begin to appear, which, when an inch or two high, prick them in separate small pots, and manage them afterwards as other succulents of the green-house.

SENECIO, Groundsel.

This genus comprehends several herbaceous perennials, and annual plants, garnished for the most part with pinnate leaves, and compound radiated flowers.

Class and order, *Syngenesia Polygamia Superflua*.

Characters.] CALYX, a common cup, conic and truncated. COROLLA, the compound flower is higher than the cup, the hermaphrodite florets are tubulous and numerous in the disk, the female ones, in the radius, are oblong, and slightly tridentated. STAMINA, five very small capillary filaments, topped with cylindric and tubulous antheræ. PISTILLUM, an ovate germen, slender style, crowned with two oblong, revolute stigmata; there is no pericarpium; the seed which is single, oval, and crowned with a long down, is contained in the cup.

Of this genus there are reckoned between thirty and forty species, several of which are common weeds; the following are therefore only cultivated in gardens.

1. SENECIO *hastatus*.

Hastated, or Spleenwort-leaved Groundsel.] Hath a perennial herbaceous stalk, rising between two and three feet high, garnished with sinuated winged leaves. The flowers are yellow and radiated, standing on very long foot-stalks, which divide at the upper part of the stalk.

2. SENECIO *purpureus*.

Purple Groundsel.] Hath a perennial stalk, rising two feet high, garnished with hairy lyrate lower leaves, and upper ones spear-shaped and dentated, the flowers come out at the ends of the stalks, are steculous, and of a purple colour.

3. SENECIO *elegans*.

Elegant Purple Groundsel.] Hath a fibrous

root, with erect stalks, a foot or eighteen inches high; garnished with equal spreading pinnatifid leaves; the flowers come out from the ends of the stalks, are radiated, the florets of the disk are of a bright yellow, and those of the radius, a rich purple colour.

Varieties.] With white flowers—with double purple flowers.

Their propagation is easily effected by cuttings of the branches planted in pots in the summer, and shaded till they have taken root, and when winter approaches, should be removed to the green-house till May, when they may be transplanted into the borders of the pleasure-garden, where they will be very ornamental during the summer: they may also be raised from seeds sown in the spring.

4. SENECIO *Pseudo-China*.

False or Bastard China-Root from Madagascar.] Hath a thick root formed of fleshy tubers, crowned with large, rough, cut leaves; and slender flower-stalks, half a yard high, terminated by compound yellow flowers, of many tubulous florets.

This is an herbaceous perennial of Africa, retained here in curious stove collections for variety, and is propagated by off-sets planted in pots plunged in the bark-bed; continuing the plants always in the hot-house or stove.

SERRATULA, Saw-wort.

It consists principally of tall, hardy, herbaceous, flowery perennials, for ornamenting the pleasure-garden; rising with annual stalks from two to seven or eight feet high, adorned with pinnatifid and entire leaves in the different species, and the stalks terminated by scaly heads of compound flowers.

Class and order, *Syngenesia Polygamia Æqualis*.

Characters.] CALYX, an oblong, imbricated, general cup, composed of many spear-shaped, acute, smooth scales.—COROLLA, a uniform compound flower, composed of many hermaphrodite funnel-shaped florets, with an inflexed tube and ventricose limb, cut into five parts. STAMINA, five short hair-like filaments, with cylindric antheræ. PISTILLUM, an oval germen, filiform style, and two oblong reflexed stigmas. PERICARPIUM, none; each floret succeeded by one oval seed crowned with down.

The principal species, in the English gardens, are the following, the first of which is a native of England, the others of different parts of America, but are all of hardy growth, consisting both of fibrous and tuberous-rooted perennials.

1. SERRATULA *tinctoria*.

Dying, or Common Saw-wort.] Hath a fibrous perennial root, upright annual stems,

two feet high, lyre-shaped pinnatifid leaves, having the terminal lobe the largest, and the stalks terminated by scaly heads of purple and white flowers in the different varieties.

This grows naturally in woods and meadows in England, &c. and is sometimes cultivated for variety.

2. *SERRATULA noveboracensis.*

New-York Saw-wort.] Hath a fibrated perennial root, upright channeled stalks, seven or eight feet high, oblong-lanceolate, ferrated, pendulous leaves, downy underneath, and the stalks terminated by heads of purple flowers.

3. *SERRATULA glauca.*

Glaucous Maryland Saw-wort.] Hath a fibrous perennial root, upright, channeled, purple stalks, six or seven feet high, oblong-oval, acuminate, sawed, glaucous, coloured leaves, and the stalks terminated by corymbus bunches of purple flowers, having roundish cups.

4. *SERRATULA scariosa.*

Scariose-flowered Virginia Saw-wort, or Tuberous Knap-weed.] Hath a tuberous perennial root; upright, strong channeled stalks, three or four feet high; spear-shaped entire leaves; and the stalks adorned upward with many purple flowers, rising laterally on obtuse peduncles, having also rough scaly calyxes.

5. *SERRATULA squarrosa.*

Squarrose Virginia Saw-wort, or Tuberous Melancholy Thistle.] Hath a tuberous perennial root, an upright stalk, near a yard high, linear, or very narrow stiff leaves, and the stalks adorned upward with purple flowers, rising laterally and sitting almost close in squarrose, or rough, scaly, acuminate cups.

6. *SERRATULA spicata.*

Spiked Virginia Saw-wort.] Hath a tuberous perennial root, upright single stalks, two or three feet high; linear leaves, ciliated at the base; and the stalks terminated by long spikes of close-sitting purple flowers, rising laterally.

7. *SERRATULA præalta.*

Tall Peached-leaved Virginia Saw-wort.] Hath a fibrous root, upright branching stalks, four or five feet high, oblong-spear-shaped, ferrated, spreading leaves, hairy underneath, and the branches terminated by loose bunches of purple flowers.

All these species of *Serratula* are perennial in root but annual in stalk, which, rising in spring, flower in June, July, and August, in the different sorts; the flowers are all compound, consisting of many tubular florets in large scaly calyxes, and in most of the sorts

are conspicuous and ornamental; but those of the American kinds are not always succeeded by good seeds in our gardens; they, however, multiply fast enough by the root.

These plants being mostly of erect tall growth, are proper ornaments for the compartments of large gardens, and to intersperse in shrubberies, and along the verges of woodwalks, &c.

Method of Propagation.

They are propagated by parting the roots, and by seeds.

By Parting the Roots.—All the sorts send out off-sets from the root, but the fibrous-rooted kinds the most abundantly, and the roots may be slipped or divided, either in autumn, when the stalks decay, or in spring before new ones begin to shoot up, though if done early in autumn they will flower much stronger in the following year.

By Seed.—All the sorts may also be raised from seeds, but the tuberous sorts, in particular, not increasing very plentifully by roots, they must be often raised from seeds, sown in autumn or early in spring, in an east border, in shallow drills; and when the seedlings are two or three inches high, prick out some of the longest in nursery-rows till autumn, then transplant the whole finally to remain.

SEXUS Plantarum, Sexes of Plants.

The different Sexes of plants, with regard to their being male, female, or hermaphrodite, is determinable by their flowers and fruit only.

All plants, from the largest tree down to the smallest mosses and fungi, and other the most minute vegetables, are furnished with flowers either visible or invisible, or concealed; but in the greater number visible and conspicuous: and in either case the flowers are the generative organs of all vegetables, being furnished with male, female, and hermaphrodite fructifications, sometimes on different plants of the same genus, and sometimes both male and female on different parts of the same plant; but the greater part of the vegetable kingdom is of the hermaphrodite kind, having both male and female organs (*stamina* and *pistillum*) all within the same flower: all which genital parts, or fructifications in the above different sexes, being essentially necessary for the purpose of generation, as serving the important office of fecundation to impregnate the embryo fruit, and fertilise the seed. See GENUS, and FLOS; also FEMINEUS FLOS, MASCULUS FLOS, HERMAPHRODITUS FLOS, &c.

Every flower, however large or minute, is furnished with generative parts, *i. e.* *stamina*

and *pistillum*, either in the same or in different plants and flowers, &c.

For example :

Male plants are such as produce male-flowers only, which male-flowers are those that are furnished only with the *stamina*, consisting of the filaments and antheræ, being the male genitals, but want the *pistillum*, or female organs.

Female plants being productive of female flowers only, such as are furnished with the *pistillum*, consisting of the germen, style, and stigma, the female fructifications, but want the *stamina*, or males.

And hermaphrodite plants are those which produce only hermaphrodite flowers, being such as contain both *stamina* and *pistillum*, the male and female organs, all within the same calyx and corolla, as prevail in the greater number of the vegetable creation.

Likewise observe,

Monœcious or androgynous plants are such as produce both male and female flowers distinct, situated on different parts of the same vegetable, as in the cucumber, melon, and many others. See the Class MONŒCIA.

Dicœcious plants, such as produce male and female flowers distinct, in separate habitations : one plant producing the males and another the female flowers. See the Class DIŒCIA.

Polygamous plants, such that bear the several sexes of flowers, as hermaphrodite and male and female flowers together. See the Class POLYGAMIA.

The existence of the Sexes of plants was greatly disputed by many of the ancient botanists and others ; but whoever is still doubtful in that point, will but examine the curious structure of flowers, and make some experiments, will soon be convinced, that the flowers of all plants are furnished with proper generative organs ; and that the male parts, the filaments, and antheræ, being furnished with a certain subtle powder, impregnate therewith the *pistillum* of the females, and fertilise the embryo fruit and seed in the germen, or ovary ; so that when the flower fades, the fruit swells, and the seeds become fertile, as may be experienced in early cucumbers in frames by carrying the antheræ of the male blossom and touch the stigma of the female flower therewith, so as to leave some of its golden powder on the stigma, or female organ, which infallibly impregnates the germen, or miniature fruit, and it will soon visibly swell and increase fast in magnitude, furnished also with fertile seed, which, without being previously fecundated by the male dust, generally prove ster-

ile, or barren, and if sown they would not germinate.

So that if we were to remove all the male flowers of cucumbers, or melons, before they blow, we render the females or fruit blossoms abortive.

Likewise, if flowers of any sort were castrated, or deprived of the male organs, the filaments and antheræ, before they ripen their impregnating powder of the antheræ, the female parts would become sterile, or, at least, the fruit would either not swell at all, or but very imperfectly, and the seeds would remain unfertilised, and if sown they would not grow.

For although some sorts of plants may probably by chance produce a sort of imperfect fruit and seeds, without the immediate vicinity of male flowers, the same as a hen may lay eggs without the congress of a cock, yet for want of being fertilised with the male sperm, neither will the seeds grow, nor the eggs bring forth chickens.

Linnaeus, in his definitions of the Sexes of plants, says, the calyx is the marriage-bed in which the male and female organs consummate the nuptials of plants, and in which these tender organs are cherished and defended from external injuries ; and the corolla, or petals, are the curtains closely surrounding the generative organs, in order to resist storm, rain, or cold ; but when the sun shines bright they expand freely, both to give access to the fecundating dust and to the sun's rays, to promote the fecundating faculty of the said powder, in acting with due effect on the stigma and style : for the filaments are the spermatic vessels of the males, by which the juice secreted from the plant is carried up to the antheræ in form of a fine powder, which is the pollen, or male dust, answering to the male sperm of animals, or the roe of fishes ; for although it is dry, it is more easily conveyed by the winds, or air, to the stigma, or female organ, where it is moistened, thence proceeds to the style, which is the vagina, or tube through which the effluvia, or male dust, passes to the germen, or ovary, and there impregnates the fruit or seed which immediately becomes fertile, and then the petals of the flower withers, and the fruit and seed grow fast to perfection.

Thus we need not wonder, that in the vegetable kingdom such numbers of plants are of the hermaphrodite race, *i. e.* the flowers having both male and female organs within the same calyx and corolla ; though in the animal kingdom there are very few of the hermaphrodite kind, for here one sex can easily go to another, whereas plants are fixed to one spot

spot and cannot go from it, so that the male and female parts of fructification being within the same cover, the fecundation is more easily effected by nature.

Other plants again having the male and female parts in different flowers, have their situation on the plants and their fructifications so wonderfully disposed by nature that the fecundation is effected by the winds and certain insects conveying the male dust from the antheræ to the female organs.

Most plants appear the most beautiful when in flower; but when the generative parts of the flower have performed their natural function, the flower soon after fades, and many plants gradually lose much of their former splendor, and numerous sorts, after flowering and ripening seeds, either decay wholly, as in all the annual and most of the biennial tribe, and some only die down to the root, as in numerous herbaceous perennials; likewise some plants and trees, after obtaining a great age and bulk, totally decay, after having once flowered; such as often occurs in the *agave*, or great American aloe, which in this country in particular, after fifty or an hundred years' growth before they attain a flowering state, they then expanding in the centre and shoot up rapidly, into a stalk of prodigious height, for flowering, which continuing in bloom two or three months, and the plants generally decay soon after, never surviving to flower again: the same also happens in the *musa paradisiaca*, or plantain-tree, which having been in some European gardens many years, and after having once flowered, no art can prevent its lofty stem from perishing the year after; and the like also often occurs in the *lavatera arborea*, or tree-mallow.

SHADING PLANTS, of young or tender growth, seed-beds, &c. from the sun occasionally.

This is often a necessary work in many particular occasions, in warm, dry, sunny weather in spring and summer, &c. in pricking out various sorts of small young plants from seed-beds into nursery-beds, pots, &c. all small cuttings, slips, above-ground off-sets, pipings, &c. as likewise in occasionally transplanting any kind of more advanced plants, flowers, &c. into beds, or pots, in a hot, dry season; and sometimes to seed-beds of particular sorts of small or curious seeds in hot sunny days; also often to plants in hot-beds, under frames and glasses, both of young and advanced growth.

The work of Shading is the most commodiously and effectually performed with garden mats in a sort of awning over the beds, to plants in the full ground, or also to plants

in pots placed close together, under a similar awning, or sometimes to seed-beds, either in an awning, or the mats spread on the surface, and if, in the latter method, occasionally watered over the mats, it proves very beneficial; or sometimes, in hot dry weather, in default of mats, some loose straw litter strewed over seed-beds, will be greatly serviceable in screening the surface from the parching sun, and preserving the moisture in the earth, to promote a more quick, regular, and free germination in the seed; and when the plants are come up, the covering is soon drawn off with a wooden or other rake lightly; and to plants under glasses in frames, &c. the occasional Shading is effected either with mats spread thinly over the glasses, or sometimes with a little loose, long litter, shaken lightly over them, just during the fierce heat of the sun: observing, that in the different occasional Shading, it should always be slight, only one mat thick, and the straw Shading in proportion, just sufficient to afford a moderate shade to intercept the approach of the sun beams, without darkening the plants, &c. too much.

The above Shading is only principally necessary in hot, dry, sunny weather, occasionally to many sorts of newly-set small plants, &c. in beds, pots, frames, as above, to defend them from the scorching rays of the sun till they have struck fresh root, and to screen some particular seed-beds similarly, till the seeds therein germinate, and the plants are come up in some advancing state; in all of which, the Shading is essentially beneficial, in case of dry hot weather succeeding the planting or sowing, as it insures more effectually a successful and expeditious free growth, which, without that aid, in the above young plants and sets, when a hot sun, would in many sorts fail considerably, or be greatly retarded; and to plants under glasses in hot-beds, when the fierce sun through the glasses occasions their leaves to flag, as in cucumbers and melons, &c. and sometimes apt to scorch the leaves, the Shading is particularly necessary for a few hours in the middle of the day.

But those occasional Shadings, it is necessary to observe, are only proposed as generally practicable to some particular sorts of plants, cuttings, &c. both of the kitchen-garden, pleasure-garden, and nursery, green-house and hot-house kinds, that are of small or moderate growth, and contained many together within a small compass, either in pricked-out beds, or in pots, frames, or under hand-glasses, so as the Shading can be readily and soon performed as occasion may require, in warm sunny weather to protect them from the scorching

ing sun till they strike root, and commence a fresh growth; and to seed-beds, &c. till the plants are come up; or sometimes, some particular sorts of small tender plants, both such as are pricked out, and others that are in seed-beds or pots, may require a continuation of occasional Shading till they are increased in some degree of strength to stand the full sun; but in plants transplanted finally into their respective different compartments in various parts of the garden, &c. the Shading would be impracticable in any general manner.

Likewise observe, in the work of occasional shading, that it is only to be continued principally in the warmest time of sunny days, generally longer to plants, cuttings, &c. not struck root, than those as are in a growing state; and generally in all plants in the full ground, or others designed for placing in the open air, having occasional shading as above, should be discontinued on evenings, mornings, and nights, that they may enjoy the benefit of the full fresh air at these times; as also tender sorts striking, or advancing in growth under glasses, having occasional shading when the sun is powerful, in the warmer part of the day, should remain unshaded before and after that time, that they may receive the necessary beneficial influence of light and air in a proper degree.

But in plants, cuttings, slips, &c. that have had occasional shading till struck good root, and begin to advance a little in a renewed growth, the shading should be mostly discontinued gradually, especially those in beds, pots, &c. in the open ground, or others designed for transplantation therein, or placing in pots, in the full air, for the summer, or as required, according to their kinds; or in some small tender plants of slender growth, the occasional shading will probably be necessary in longer continuation till they acquire more strength; and to plants remaining all summer in hot-beds, or under frames and glasses, the continuance of occasional moderate shading, in hot sunny days will be eligible; but most young plants, cuttings, &c. pricked out or planted as above, and designed for the full ground or open air, not continued under glasses, having the benefit of occasional shade till well struck, is all they require on that consideration.

Respecting the sorts of plants to which occasional shading at particular periods of their growth and culture would either be indispensably necessary, or beneficially assistant, are very numerous, both in herbaceous, shrubby and succulent kinds, hardy and tender, and as they are generally intimated in their respective genera, under the article of *Propagation*, &c.

it is unnecessary to enumerate them here: so shall only just mention that it is of utility occasionally in most departments of gardening, such as in the kitchen-garden is useful in pricking out many sorts of small young plants, and in some small seed-beds; and in the flower and pleasure-garden, in pricking out and potting many sorts of tender annuals, numerous sorts of perennials, and many shrubby plants; and in the nursery is useful in numerous sorts of small young plants, cuttings, slips, seed-beds, hot-beds; as also in the green-house and hot-house, in the propagation of the various plants by seeds, cuttings, slips, off-sets, &c.

SHIFTING PLANTS in Pots, from smaller into larger, &c. and into fresh earth.

This is a necessary occasional culture to all plants in pots, both with design to assist them with larger pots according as the advanced growth of the particular sorts renders it eligible, and at the same time to have the opportunity of supplying an additional portion of fresh earth about the radical fibres, beneficially to the prosperity of the plants, and sometimes is requisite principally for the application of fresh compost, either part or wholly, and either in consideration of the plants having remained long unremoved, and the old earth in the pots much decayed, or on account of some defect of growth in particular plants; and in all of which cases the occasional shifting into larger or new pots, and some addition of fresh earth, less or more, always proves very beneficial culture to plants in pots in general, both hardy and tender kinds of every order and nature of growth.

In regard to the requisite occasion for shifting, it, in some degree, is according to the advancing growth of the different sorts of plants: some sorts of a strong free growth may require shifting once every year or two, in their principal advancing state; others, more moderate growers, or of settled growth, once in two or three years; and some large-growing kinds, advanced to some considerable size, having been occasionally shifted, in their increasing growth, from smaller into larger pots of different proportionable sizes, and some probably from large pots into tubs, of larger dimensions, such as in large plants of *Agave* or American Aloc, orange and lemon trees, &c. they in that advanced state, in large pots, or tubs in proportion, will sometimes only need occasional shifting once in three or several years, especially when the pots or tubs are capacious, containing a large supply of earth, and are occasionally refreshed with some new compost at top, and a little way down round the

the sides about the extreme roots: for in such plants of considerable growth, in the larger or full-sized pots or tubs, it would, in some sorts, be attended with much trouble to shift them often; and some small slow-growing plants, as in many of the succulent tribe, the shifting them once in two or three years may be sufficient; other sorts want shifting annually into larger pots, accordingly as they advance considerably in a free growth, both of hardy and tender kinds, herbaceous and shrubby plants, &c. and in some of the tender annual flower-plants, cultivated in pots, and forwarded in hot-beds, they being planted first in small pots, will want shifting, in their increased growth, into larger sizes, once or twice the same season, from April to May, or beginning of June, when being shifted finally into the requisite full-sized pots, they remain therein during their existence, terminating in September or October following.

So that agreeable to the above intimations, in regard to the nature of the different growth of the various sorts of plants, generally or occasionally cultivated in pots, the necessary shifting may be ordered accordingly; some annually, others once in two years, and some only once in three years, or more; regulating the whole on this occasion as it may seem necessary, according to the different growths of the respective plants, sizes of their present pots, the time they have remained therein, and according as a supply of fresh earth may appear more or less requisite, as this is always a principal consideration not to be omitted in the work of Shifting.

Though it should be observed, that as plants in pots, &c. are limited therein to the small compass of earth about the roots, the Shifting is thereby necessary in most sorts, in their principal advancing growth, once in a year or two, or some three years at farthest, either wholly into larger pots where requisite, otherwise some replanted with fresh earth, in the same, or others nearly of similar size, where larger pots are not so materially wanted as a supply of fresh earth; and in the whole, in every case of Shifting, removing and replanting in pots or tubs, some addition of fresh earth, more or less, must always be applied at the same time, as hereby the shifting is rendered essentially effectual for the prosperity of the plants in their future growth.

And it may likewise be observed, that although large-grown plants, either of the shrub or tree kind, American aloes before mentioned, and other plants of large growth, now finally stationed as it were in the fullest sized large pots and tubs, will succeed several years therein,

without shifting, they, in this case, should in the interval have the top earth loosened, and down round the sides to some little depth, removing the loosened old soil, and fill up fully with fresh earth, settling it close by a moderate watering.

The general season for occasional Shifting such plants as may require it, is principally the spring and autumn: March and April, or early part of May for the spring Shifting; and August and September for that of autumn; though in plants that can be removed with the full ball of earth about the roots, they may be occasionally shifted almost any time; however, for any general Shifting, the spring and autumn are the most successful seasons, as the plants will then sooner strike fresh root; and many sorts preferably in the spring, by having the benefit of the same advancing growing season, and that of summer.

In the business of Shifting, it is generally advisable to remove the plants from the smaller to the larger pots, mostly with the ball of earth about the roots entire, either wholly, or some of the outward old earth, and the dry or matted radicle fibres trimmed away carefully, not to disturb the principal roots in the body of the ball of earth, which being preserved, more or less, the plants receive but little check in growth accordingly, by the removal; or sometimes when any particular plant, shrub or tree, &c. in their respective pots, discover by their top, or above-ground growth, symptoms of a declining state, as probably the defect may be either in the root, or the old ball of earth, it is proper, in Shifting, to shake all the said earth entirely away, in order to examine the root, and to trim and dress it accordingly, as the case may seem to require, and to replant it in entire fresh compost.

In preparing for the occasional Shiftings, when necessary to give larger pots, &c. provide them of proper sizes in some regular gradation larger than the present ones, in a smaller or greater degree, according to the nature and growth of the respective plants; the whole placed ready, together with a proper quantity of fresh compost earth in proportion to the number and size of the plants intended to be shifted.

Then, in proceeding to the Shifting, let those plants intended to be transplanted with balls, be removed out of their present pots one at a time, with the whole ball or clump of earth about the roots as entire as possible; and if a large, tolerably full ball, may, with your knife trim off some of the outward loosest earth, and the extreme fibres of the root; but if

If a small ball of earth, adhering together compactly, may commonly preserve the whole entire; observing, in either case, that where very matted dry or decayed fibres surrounding the ball occur, trim them as it may seem necessary: otherwise in those of a fresh lively growth, cut only any loose straggling parts thereof: likewise give any requisite pruning, trimming or dressing in the head or top, where it may seem proper, according to its state of growth, and that of the natural habit of the different plants; many sorts may probably require very little or none; others as may casually have very naked, or irregular, uncomely, or decayed heads, especially of the shrubby tribe, it may probably be proper either to prune them down, less or more, or to prune any very disorderly or weakly bad growth, or decayed shoots, &c. and in some others of different growths, they may require some little trimming or dressing conformably to their natural order, either to detach any bad or straggling growth, or sometimes very infirm and casual decayed parts, and dead leaves, &c. however, in all plants having tops of a fresh lively state, and regular good growth, according to their respective kinds, no pruning or trimming will be required, and similarly in plants not furnished with immediate tops, at the time of Shifting.

So thus far proceeding agreeable to the above intimations, then having prepared the intended pots for the reception of the plants, by placing some pieces of tile or oyster-shell, &c. loosely over the holes at bottom, and laid in a little fresh earth two, three, or four inches deep or more, according to the size of the pot: set the plant therein with its ball of earth, as above, filling up around with more fresh mould, raising it an inch or two over the top of the ball; and directly give a moderate watering to settle the earth close about the ball and roots regularly in every part, in a proper effectual manner: and thus proceed in Shifting the whole in as many as intended.

As probably, in the above Shifting with the entire ball of earth about the roots, the ball sometimes, in particular plants, may appear very compactly hard and binding, in which case it would be proper to loosen it a little, by thrusting a sharp-pointed stick down into the earth in different parts, giving it a gentle wrench, to open the earth moderately; or sometimes it may also be proper to trim away some of the old earth at top and sides; so plant it as above, and fill up round and over the ball with fresh earth, and watered.

In the course of Shifting different sorts of

plants in pots occasionally, hardy or tender, either shrubby, succulent, or herbaceous, if any appear of a sickly, very weak, or unprosperous growth, it would be advisable to clear off some considerable part of the outward old earth from the ball about the roots, or, in some cases, shake it wholly away therefrom, that, as we formerly intimated, if the defect in growth is occasioned either by some fault in the roots, or in the earth, you may have the opportunity of remedying it in some degree, both by pruning out any decayed or bad parts of the said roots, and by replanting them wholly in entire fresh earth; and, at the same time, it may in some be proper to prune or trim any very infirm, or unprosperous and decayed shoots, or other similar bad and unseemly parts of the head, according to the nature of growth of the particular plants, ordering them conformably as it shall seem expedient, consistent with their general habit.

Sometimes, particular sorts of plants in pots need Shifting, more for the advantage of having some supply of fresh earth, than for want of new or larger pots; and as probably, in this case, some of the same or present pots, may be still of eligible size in which to re-pot them, these pots, thus intended, should be well cleaned from all adhering parts of the old earth, and replenished with entire new at the time of re-potting the plants; which being now removed out of their said pots, either with the entire ball about the roots, and part of the old mould cleared off all round, to admit of a larger portion of fresh earth in the pot at replanting; or in some, appearing of an infirm or declining habit, the whole ball of old earth displaced clean to the roots, as it may seem proper, agreeable to foregoing intimations; giving also any occasional trimming or dressing to the root and top, as may appear requisite, conformably likewise to former remarks in that case; then having furnished the pots, either new ones or the same, with fresh earth, replace the plants therein, filling up the pot regularly with a sufficiency of the same fresh mould, and finish with a moderate watering to settle the whole close about the roots.

After Shifting, if not watered at the time of removal, generally give a moderate watering both to the earth in the pots to settle it close about the roots; and in most sorts, water also highly over the top or head of the plants to wash off any casual foulness; then set the pots of plants in their respective stations in the garden, &c. the hardy kinds, if warm sunny weather,

weather, may place in a shady border for two or three weeks, till struck fresh root in the new earth: the tender sorts dispose in their places among the green-house and stove plants, or some to have the benefit of Shading in the middle of hot sunny days, till fresh struck, as above observed; or probably some of the more tender plants of particular sorts will require to be plunged in a hot-bed or bark-bed, more especially some of the stove kinds; or also, on particular occasions, some principal sorts of the more curious or tenderer green-house plants, to expedite their fresh-rooting more effectually; and sometimes tender annuals in hot-beds, potted in their early young growth, will, at Shifting, require to be replunged in the hot-bed to fresh strike, and forward them till May or June; but generally all the full-ground or open-air plants will only sometimes require a little occasional Shading in hot dry weather the first two or three weeks, and some shifted with full balls about the roots, will only need occasional watering: observe in the whole, both hardy and tender kinds, to supply them with repeated moderate waterings.

SIDA, Indian Mallow.

A genus comprising some tender herbaceous perennial exotics of Africa and America, &c. introduced in our gardens principally as hot-house plants, for variety and ornamental flowering; adorned with heart-shaped, roundish and oblong leaves in the different species, and hermaphrodite columniferous flowers; having a simple calyx, five petals, and many united columnar stamina, erect germen, and many-parted style, crowned with thin stigmas; succeeded by a membranous, many-parted capsule, of many internal cells, one seed in each loculament.

Class and order, *Monodelphia Polyandria*.

The most noted species are,

1. SIDA cordifolia.

Heart-leaved Indian Mallow.] The leaves heart-shaped, sub-angular, sawed, and vilous.

2. SIDA Abutilon.

(Abutilon) or Round-heart-leaved Indian Mallow.] The leaves roundish-heart-shaped, and undivided peduncles, shorter than the leaves.

3. SIDA rhombifolia.

Rhombous-leaved Indian Mallow.] With the leaves lanceolate-rhombus-shaped; and the axillas mostly two-thorned.

4. SIDA periplocifolia.

Periploca-leaved Sida of Ceylon and America.] With the stem panicle-flowering; and oblong heart-shaped entire leaves.

5. SIDA triquetra.

Three-sided American Sida.] Having the

branches mostly three-sided, and heart-shaped, sawed leaves, somewhat downy.

6. SIDA americana.

American oblong-leaved Sida.] The leaves oblong-heart-shaped, and undivided; and capsules many-celled, the length of the calyx.

7. SIDA multiflora.

Many-flowered Indian Mallow.] All these plants being natives originally of the warm parts of the Indies, require culture in our hot-houses in this country; in which they claim admittance for variety and ornament, as they will form an agreeable diversity in their different foliage, and order of flowering; plant them in pots separately of lightish garden earth, and stationed any where in the stove, &c. and may be propagated by seed, off-sets, and cuttings.

SIDERITIS, Iron-wort.

This genus comprises, for the green-house, three species of under-shrubby, and taller shrubby exotics, natives originally of the south of Europe, Asia, and Africa, &c. growing with downy stalks, one or two feet, to five or six feet high, in the different species; garnished with lanceolate, heart-shaped, and oblong downy leaves; and tubular, labiated, or lip flowers, terminating the branches in whorled spikes: having tubulous, five-lobed calyxes, monopetalous, tubulose corolla, with trisid and bifid lips; two longer and two shorter stamina, a four-parted germen, single style, succeeded by four naked seeds.

Class and order, *Didynamia Gymnospermia*.

The principal species in our gardens are,

1. SIDERITIS syriaca.

Syrian Under-shrubby Iron-wort.] Grows with low, under-shrubby, downy-woolly stalks; spear-shaped entire leaves; and yellow flowers in a verticillus.

2. SIDERITIS canariensis.

Canary Shrubby Iron-wort.] Rises with taller, shrubby, hairy-downy stalks; large heart-shaped-oblongish, acute, woolly leaves; and verticillate spikes of whitish flowers.

3. SIDERITIS cretica.

Cretan Shrubby Iron-wort.] Grows with shrubby downy stalks, and divaricated branches; heart-shaped-oblong, obtuse, downy leaves; and verticillate spikes of flowers.

These are tender evergreen plants, require the protection of a green-house in this country in winter, and are therefore always kept in pots, and placed in the green-house collection, in which they form an agreeable variety at all seasons, and generally flower in June, July, and August; succeeded by ripe seeds in autumn, by which they may be propagated; sown in pots in the spring, and placed in a hot-

bed ; also by cuttings and layers, having the same assistance, especially the cuttings ; and by either of which method of propagation, when the new raised plants are a little advanced in their young growth, transplant them into separate small pots of light meilow earth : managing them afterwards as other shrubby exotics of the green-house ; in which they all succeed by the same mode of culture.

SIDEROXYLON, Iron-Wood.

It consists of shrubby ever-green exotics of Africa, retained here in our stoves and green-houses for variety, and a hardy deciduous American shrub for the shrubbery ; are adorned with oval and spear-shaped leaves, in one sort large, the others small, and monopetalous wheel-shaped flowers.

Class and order, *Pentandria Monogynia*.

Characters.] CALYX is small, monophyllous, five-parted at top, and permanent. COROLLA is monopetalous, wheel-shaped, and five-parted. STAMINA, five awl-shaped filaments, having oblong incumbent antheræ. PISTILLUM, a roundish germen, awl-shaped style, and simple obtuse stigma. PERICARPIUM, a roundish umbilicated unilocular berry, containing one oval unilocular nut.

There are about three species, one of which is inermous, or without spines, the others are spinous.

1. SIDEROXYLON *inermis*.

Smooth Ethiopian Sideroxylon.] Rises with a shrubby stem, branching irregularly six or eight feet high, being inermous, or without spines, garnished with large, oblong-oval, firm, smooth, shining, green leaves, and flowers at the sides and ends of the branches.

2. SIDEROXYLON *spinosum*.

Spinous Malabar Sideroxylon.] Rises with a shrubby branching stem, several feet high, armed with spines, smaller oblong-oval, firm, smooth, perennial leaves, and flowers at the ends of the branches.

The above two plants rarely flower in England.

They being tender exotics from hot countries, are tender, and require protection here of a stove, or green-house, though they are commonly retained as stove-plants ; but will also succeed tolerably well, with the culture of green-house exotics, having residence of a good green-house in winter, so must always be kept in pots, and stationed among the plants of one or other of the above departments.

3. SIDEROXYLON *lycioides*.

Lycium-like, or Thorny Cananda Iron-wood.] Hath a shrubby stem and branches, armed

with spines, and garnished with spear-shaped, shining-green, deciduous leaves.

The wood of these shrubs being so very solid, remarkably hard and ponderous, as to sink in water, they obtained the appellation of Iron-wood.

The three species are kept in many of our principal gardens for variety ; the first two, being tender, are introduced in the stove or green-house collections, as they cannot stand the full air in this country, only in the principal warm summer months ; but the third is hardy, and proper to admit in the shrubbery plantations, as a deciduous shrub, in assemblage principally with others of the same tribe.

They are propagated by seeds procured from abroad, which of the two first sorts in particular, must be sown in spring, in pots of rich earth, and plunged in the bark-bed ; and when the seedlings are come up two or three inches high, pot them off separately ; try also cuttings and layers of the young shoots, by assistance of a hot-bed as above ; and the plants raised by either method, planted in separate pots, continue them always as residents of the stove or green-house, to have the protection and culture, as the other exotics of these departments, as before suggested.

The third sort is also raised from seed in the spring on a bed or border of light earth, or forwarded in a hot-bed ; likewise by slit-laying or cuttings of the young shoots, in the common method ; or generally nicking the layer shoots, &c. for being a hard wood it does not emit roots very freely.

SILENE, Viscous Campion, &c.

The plants are mostly hardy herbaceous annuals and perennials, some of which merit culture, as flowering plants, which are principally of erect growth, with stalks about twelve or fifteen inches to half a yard, or two or three feet high, in the different species ; garnished with oblong-oval, and narrow simple leaves, and the stalks terminated by bunches of small pentapetalous flowers.

Class and order, *Decandria Trigynia*.

Characters.] CALYX is monophyllous, quinque-dentate, and permanent. COROLLA, five plane, obtuse, sometimes bifid petals, with narrow unguis, and a nectarium formed of two denticles in the neck of each petal. STAMINA, ten awl-shaped filaments, alternately inserted into the unguis of the petals, having oblong antheræ. PISTILLUM, a cylindric germen, three simple styles, crowned by stigmas, reflexed contrary to the sun. PERICARPIUM, a cylindric trilocular capsule opening five ways at top, and many reniform seeds.

There

There are many species, annuals, biennials, and perennials, and of which the following are the most noted sorts.

1. *SILENE Armeria.* (Annual.)

Clammy Viscous Champion, commonly called Lobel's Catch-fly.] Rises with erect, branchy, clammy stalks, half a yard high, having the upper leaves heart-shaped, and all the branches terminated by fastigiated bunches of flowers, of different colours in the varieties.

Varieties.] Common red-flowered—white-flowered—purple-flowered.—All of which flower in June and July.

2. *SILENE quinquevulnera.* (Annual.)

Dwarf Viscous Champion, commonly called Dwarf Lychnis.] Rises with upright channeled stalks, branching numerously twelve or fifteen inches high, oval-spear-shaped, hairy, opposite leaves, and all the branches terminated by short spikes of purple flowers edged with white, having roundish entire petals, succeeded by erect fruit alternately:—flowering in May, June, and July.

3. *SILENE pendula.* (Annual.)

Pendulous Viscous Champion.] Rises with an upright branching stalk, a foot high, oval-spear-shaped pointed leaves, and branches terminated by spikes of bright-red flowers, succeeded by pendulous fruit, having ten rough angles, and filled with seeds, appearing in June and July.

The above species are hardy annual flowers, and have been long in estimation for adorning the borders in summer, being commonly sown in small patches in the places where they are to flower.

4. *SILENE muscipula.* (Biennial.)

Spanish Viscous Champion.] Hath a biennial root, an upright, round stalk with swelling joints, and branching by pairs, a foot and half high; narrow spear-shaped, smooth leaves, surrounding the stalk in clusters; and at the axillas, close-fitting, red flowers, with bifid petals.

5. *SILENE viridiflora.* (Biennial.)

Green-flowered Portugal Champion.] Hath a biennial root, upright, downy stalk branching alternately a foot or more high; oval-spear-shaped, downy leaves, and the branches terminated by panicles of whitish-green flowers.

6. *SILENE nutans.* (Perennial.)

Nodding Mountain Viscous Champion] Hath a fibrous perennial root; upright stalks, two feet high; spear-shaped leaves; and from the upper part of the stalks, nodding panicles of white flowers arranged, drooping on one side, having bifid petals.

7. *SILENE bupleuroides.* (Perennial.)

Bupleuroid-leaved Persian Viscous Champion.] Hath a perennial root, crowned with large clustered heads of spear-shaped acute leaves; upright stalks a foot and a half high; and opposite pedunculi, each sustaining two or three white flowers with bifid petals and short bracteæ.

8. *SILENE fruticosa.* (Perennial.)

Shrubby Sicilian Viscous Champion.] Rises with a low shrubby stem, branching a foot or more high, having broad spear-shaped leaves, and trichotomous panicles of greenish-white flowers.

All these plants flower here in summer from May till August in the different sorts, each flower having five petals, and several of the sorts produce ripe seeds, particularly the annuals and biennials, by which all the sorts may be raised, and the perennials also by seed, and by parting the roots, &c.

They are all hardy herbaceous plants, and for the general part have very viscous or clammy stalks, particularly just below the joints, to which flies often stick fast, hence the name Catchfly, and Viscous Champion, &c. See also *LYCHNIS viscaria.*

They will all prosper in any of the garden compartments, and may be employed for ornament and variety in different parts of the pleasure-garden.

The annual sorts, in particular, are cultivated in many gardens as flowery plants, which being raised from seed may be sown in autumn or spring, where they are to flower: the autumnal-sown plants flower earlier and strongest, though it is best to sow at both seasons, but principally in the spring, in March or April; repeating also the sowing in the early part of summer, in order to obtain a longer bloom, observing to sow them in patches about the borders; and after the plants come up, thin out the weakest, leaving only two or three in each patch, and they will then grow strong and flower plentifully in June and July, and ripen abundance of seeds in autumn.

The biennial sorts are raised from seeds sown in autumn or spring in a bed or border and raked in, and when the plants are come up an inch or two high, prick them out in nursery-beds till autumn, then transplant them into the borders, &c.

The perennials may be propagated by slipping their heads, and parting the roots, and the shrubby sort also by slips and cuttings of its branches or shoots, in spring and early part of summer, planted in a shady border.

They may also be raised from seeds like the biennial sorts.

SILPHIUM, Bastard Chrysanthemum.

The plants are principally tall-growing, herbaceous perennials, for ornamenting the pleasure-ground, rising with annual stalks several feet high, adorned with divided and entire leaves, and the stalks crowned with compound radiated flowers.

Class and order, *Syngenesia Polygamia Necessaria*.

Characters.] **CALYX** is oval, scaly, imbricated, and permanent, having the scales prominent and reflexed in the middle. **COROLLA**, a compound radiated flower, consisting of funnel-shaped, male florets in the disk, and spear-shaped females in the radius. **STAMINA**, five small filaments in the male florets, having cylindric antheræ. **PISTILLUM**, in the females, an oblong germen, slender simple style, and two bristly stigmas. **PERICARPIUM**, none. **SEMEN**, in the females a single oblong-heart-shaped seed, having a membranaceous two-horned border.

The species are,

1. **SILPHIUM trifoliatum.**

Trifoliate Virginian Silphium.] Hath a fibrated, ligneous, perennial root; upright, firm, purplish stalks, branching four or five feet high; large, oblong, rough, sharply-serrated leaves, generally by threes or fours round the stalk; and at the sides and ends of the branches long peduncles, each sustaining one radiated yellow flower.

2. **SILPHIUM solidaginoides.**

Solidaginoid Virginian Silphium.] Hath a fibrated perennial root; upright stalks a yard high; spear-shaped, acute, serrated, opposite leaves on short foot-stalks; and the stalks terminated by radiated yellow flowers loosely disposed.

3. **SILPHIUM Asteriscus.**

(Asteriscus)—or American Silphium.] Hath a fibrous, perennial root; upright, thick, hispid stalks three or four feet high; oblong, rough, undivided, close-sitting leaves, alternate below, but opposite above; and the stalks terminated by radiated yellow flowers.

4. **SILPHIUM laciniatum.**

Laciniated American Silphium.] Hath a fibrous, perennial root; upright, very thick, simple stems, eight or nine feet high; large pinnatifid, sinuated leaves alternately; and the stalks terminated by radiated yellow flowers.

All these four species flower here annually in July and August, the flowers are universally compound and radiated, each flower consisting of many florets in one scaly, imbricated general calyx, tubular florets in the disk,

and spear-shaped ones form the radius; but the seeds do not ripen freely in England.

They are all very hardy herbaceous perennials, durable in root, but renew their stalks annually in spring, which flowering in summer, decay to the root in autumn.

All the sorts are proper ornamental furniture for large compartments, in assemblage with other tall-growing perennials, where they will effect a good variety in summer.

They are all easily propagated by parting their roots in autumn, or spring, planting the slips at once where they are to remain, and they will flower the following Summer.

SINAPIS, Mustard.

The plants are mostly hardy herbaceous annuals, some of which merit culture as esculent herbs, both for fallading, and for their seeds for making mustard; all of which rise with erect branchy stalks from two to three or four feet high, garnished with broad, rough, deeply jagged leaves, and the branches terminated by spiked clusters of tetrapetalous cruciform flowers.

Class and order, *Tetradynamia Siliquosa*.

Characters.] **CALYX**, four narrow, cruciform, deciduous leaves. **COROLLA**, four roundish, planè, cruciform petals, and four oval nectari. **STAMINA**, four long and two short filaments, having erect patent antheræ. **PISTILLUM**, a taper germen, a style the length thereof, crowned with a headed stigma. **PERICARPIUM**, on oblong, swelling, rough, bilocular, bivalvous pod, having many globose seeds.

The principal species for general culture are,

1. **SINAPIS alba.**

Common White Mustard.] Rises with large, rough, jagged leaves, upright, branchy, hairy stalks two feet high, or more, garnished also with jagged rough leaves, and all the branches terminated by loose spikes of numerous small yellow flowers, succeeded by hispid pods, having long oblique beaks, and contain white seeds.

This is the common White Mustard usually cultivated in gardens as one of the small salad herbs, and may also be raised for its seed to make Mustard.

2. **SINAPIS nigra.**

Black Mustard.] Rises with erect, branching stalks, three or four feet high, garnished with large, rough, jagged leaves, and the branches terminated by spiked clusters of yellow flowers, succeeded by smooth pods, tetragonous at top, containing blackish-red seeds.

This

This is the sort which is commonly cultivated in fields for its seed, of which to make the common Mustard for general use.

3 SINAPIS *arvensis*.

Field Mustard.] Rises with erect stalks two feet high, garnished with oblong, rough leaves, and the branches terminated by bunches of yellow flowers, succeeded by multangular, swelling, turgid pods, with long beaks.

The two first species flower in June, and the seeds ripen in July and August, but the third flowers in May, and the seeds ripen in June.

These three species of *Sinapis* are hardy herbaceous annuals, that grow naturally in the fields in England, and most parts of Europe; but the second and third sort, in particular, grows abundantly among the corn, and by way-sides in many parts of England, and are also cultivated in gardens and fields in large quantities for their seeds to manufacture for flour of mustard. The *Sinapis alba*, however, is cultivated in gardens principally as a small salad herb, and sometimes for its seed as above; but the *Sinapis nigra* is chiefly cultivated in fields or gardens in considerable quantities for its production of seed for the article Mustard, aforesaid, though good Mustard may be made of both these sorts; the seed of which being sown in the spring soon come up, shoot up to stalks, and produce ripe seeds in three or four months, then totally perish; so that a fresh supply is raised annually from seed.

The White Mustard, however, being used in gardens as a salad-herb, is sown along with other small sallading at all times of the year, even sometimes every week or fortnight, in a bed or border of light earth, sown generally in shallow drills very thick, covering it very thinly with earth; and in winter, and early in spring, during the cold weather, is sown also in hot-beds; and the herbs are always cut for use whilst in the seed-leaf and but a few days old; otherwise they will become too strong and rank tasted.

But for the particular methods of raising this sort as a salad-herb, together with other small sallading at different times of the year, see SALLAD-HERBS and SMALL SALLADING.

Observe, in order to save seed of this sort for garden use, sow it on an open spot of ground in March or April, either thinly in drills a foot asunder, or broad-cast all over the surface, and let the plants run up to stalk, and they will furnish ripe seeds in August.

To raise the plants for the seed for Mustard,

they should be sown in the spring, any time in March, in some open situation, either in a kitchen garden, or in the open fields, where large quantities are required for sale; in either case, having digged or ploughed the ground, then sow the seed broad-cast all over the surface, and rake or harrow them in lightly, or sow it in shallow drills a foot asunder. They will soon come up, observing, that when the plants have four or more leaves an inch or two broad, if they stand very thick, those sown in the broad-cast way particularly, should be hoed and thinned, leaving them six or eight inches asunder, and cut up all weeds, repeating it once or more if necessary; after this the plants will soon spread and cover the ground, and shoot fast up to stalks for flowers and seed, which will ripen in July or August, when the stalks should be cut or pulled up, and the seed being properly hardened, and dry in the pod, may either be threshed out directly, as much as convenient, or stacked up dry, and threshed at occasional opportunities.

SISYMBRIUM, Water-Cress.

Consists of hardy herbaceous annuals and perennials, mostly of the aquatic tribe, one of which is in high estimation as a salad-herb; are mostly of spreading growth, garnished with pinnated and pinnatifid leaves, and the stalks terminated by spikes of small tetrapetalous cruciform flowers.

Class and order, *Tetradynamia Siliquosa*.

Characters.] CALYX, four linear, spear-shaped, spreading, deciduous leaves. COROLLA, four oblong, patent, cruciform petals. STAMINA, four long and two short filaments, having simple antheræ. PISTILLUM, an oblong, slender germen, very short style, and obtuse stigma. PERICARPIUM, a long, taper, incurved, bivalvous, bilocular pod, having many small seeds.

There are many different species of this genus, but the greater part being plants of no merit are rarely cultivated: one sort, however, *Common Water-Cress*, demands attention as a wholesome salad-herb.

SISYMBRIUM *nasturtium*.

Nasturtium aquaticum, or Water-Cress.]

Hath a fibrous, spreading, perennial root, striking deep in the mud under the water, and sends up several branchy shoots, becoming hollow stalks, garnished with pinnated leaves of four or five pair of nearly heart-shaped lobes, and an odd one, and the branches terminated by loose spikes of small whitish flowers in June, and the seeds ripen in July.

This plant is a perennial, grows abundantly in shallow standing waters, on the margins

gins of small rivers, brooks, running springs, watery ditches, and moist meadows, almost every where; and being of a fine warm, agreeable, fat relish, is greatly esteemed as a winter and spring salad-herb, and as such every one may obtain it at an easy rate, either by gathering it themselves where it grows naturally, or by purchasing it of the simplers, or herb-people, especially about London, where great quantities are daily brought for sale in autumn, winter, and spring, tied in small bunches, which they retail in the markets, and about the streets, at about two pence or three pence *per* dozen; and many people buy them constantly as a choice, wholesome, palatable salad, to eat either alone, or mixed with other salad-herbs.

It is a good purifier of the blood, and is admirable against the scurvy.

This plant, however, as it grows wild in great plenty almost every where in watery places, is rarely cultivated in gardens, though it may be easily raised abundantly in any quite shallow water, or a pond, stream, ditch, &c. and other moist places, either by transplanting the plants with roots from the places of their growth, or by seed.

Its propagation therefore may be effected both by parting the roots and by seed.

By parting the Roots.—In spring, or any time of the year, whilst the plants are young, may easily slip off a quantity, with plenty of roots to each, which plant directly, in some shallow, watery place, as before observed; they will readily strike into the mud, spread considerably, and will ripen seed and sow themselves, and furnish plenty of plants for use.

By Seed.—Procure a quantity of the seed in summer as soon as ripe, in the places where the plants grow naturally, and sow them directly in any moist place to remain; or get a quantity of the plants just as the seeds begin to ripen, and throw them into any shallow water, they will strike root, ripen, and shed their seeds, which falling to the bottom will grow and furnish plenty of young plants.

SISYRINCHIUM, *Bermudiana*.

The plants are low, herbaceous, flowery perennials for the pleasure-garden, rising with sword-shaped leaves and stalks half a foot high, adorned at top with spathaceous hexapetalous flowers.

Class and order, *Gynandria Triandria*.

Characters.] **CALYX** is a spatha, or sheath, formed of two compressed, keel-shaped leaves. **COROLLA**, six oblong-oval, acute-pointed, spreading petals. **STAMINA**,

three very short gynandrious filaments, with bifid antheræ affixed to the style. **PISTILLUM**, an oval germen under the flower, awl-shaped style, and trifid reflexed stigma. **PERICARPium**, an oval, trigonous, trivalved, trilocular capsule, having numerous roundish seed.

The principal species is,

SISYRINCHIUM *Bermudiana*.

(*Bermudiana*) — or *Bermudian Sisyrrinchium*.] Hath a fibrous perennial root, crowned with several sword-shaped, two-edged, stiff leaves, five or six inches long; amidst them an erect, two-edged stalk, half a foot high, garnished also with sword-shaped, amplexicaule leaves, and adorned at top with several spreading deep-blue flowers, having yellow bottoms.

Variety.] *Virginian Sisyrrinchium*. Hath a fibrous perennial root, crowned with narrow sword-shaped leaves, but three or four inches long, and erect two-edged stalks the same height, terminated by two or three pale-blue flowers.

Both these varieties flower in June, and are succeeded by ripe seeds in autumn.

They may be employed as flowery plants in any of the compartments of the pleasure-ground, placing them towards the front in assemblage with other low perennials, where they will cause an agreeable variety.

Their propagation is by parting the roots, and by seed.

By parting the Roots.—This may be performed in autumn, any time in September or October, when the roots may be taken entirely up, and slipped into several separate off-sets, but not too small, planting them again directly, and they will root firmly before winter, and flower the year following.

By Seed.—Sow them in autumn, or early in spring, in an east border, in shallow drills, covering them half an inch deep; they will come up in April or May, like grass; keep them weeded all summer, and towards autumn prick out a quantity in nursery-rows six inches asunder, to stand till spring or autumn following, then transplanted with balls, to where they are to remain.

SIUM, Water-Parfnep and Skirret.

This genus is composed of hardy herbaceous perennials, one of which, (Skirret) having an esculent root, is sometimes cultivated in kitchen-gardens; the others being plants of no utility for use or ornament in gardens are rarely cultivated; they rise mostly with winged leaves and upright annual stalks, terminated by umbellate clusters of flowers.

Class and order, *Pentandria Digynia*.

Characters.] **CALYX**, umbellate flowers, having

having the general umbel composed of several smaller plane umbels, with the general involucre formed of many spear-shaped, reflexed leaves, and the partial ones of many small narrow leaves. **COROLLA**, the general umbel is uniform and composed of many small flowers, each having five heart-shaped, inflexed petals. **STAMINA**, five filaments with simple antheræ. **PISTILLUM**, a small germen under the flower, two reflexed styles, and obtuse stigmas. **PERICARPIUM**, none. **SEMEN**, two oval seeds to each floret.

There are seven or eight species of this genus, one of which only, an esculent, has merit as garden plants, some being wild weeds of ditches, and other moist places in England, &c. and seldom admitted into gardens.

The garden sort is,

Sium Sifarum.

(*Sifarum*)—or *Skirret*.] Hath a perennial eatable root, composed of several oblong, thick, fleshy fibres, collected into a head at top, crowned with pinnated leaves, of two or three pair of oblong folioles and an odd one, and when it shoots to seed, rises with an upright stalk a foot high, having ternate leaves above, and terminated by an umbel of white flowers.

The root of this plant is eatable, of a sweetish relish, being boiled and eaten like carrots and parsneps, and was formerly in much esteem, but has become in disrepute of late years; it is, however, accounted a very wholesome root.

Method of Propagation.

It is propagated both by seed and by off-sets of the roots.

By Seed.—In spring, any time in March, or beginning of April, is the season for sowing, choosing an open situation, which being properly digged, sow the seed either broad-cast all over the surface and raked in, or in shallow drills a foot asunder; they will come up in a month or five weeks, and in about three weeks after they must be cleaned from weeds, and thinned either by hand or hoe, leaving the plants six or eight inches distance; the plants will soon after cover the ground with their leaves, and the roots increase in growth till the leaves decay in autumn, then they will be fit for use, and continue good till next spring, when they will shoot up for seed.

By Off-sets of the Root.—The roots put out many side off-sets, which in spring being slipped off separately each with one or more buds or eyes at top; and in an open spot of ground plant them with a dibble in rows a foot asunder, with the crown of each slip an inch within the ground; or may plant them thin by trench planting, in small trenches, as for al-

paragus, placing them erect against the back of the trench, and cover in the mould over them the above depth; in either method the plants will soon come up strong, and by autumn following the roots will be full grown, and increased into large bunches fit to take up for use from October till March.

To save seeds of this plant, let a few of the large roots stand to shoot up into stalks, which will flower in July, and the seeds will ripen in autumn.

SLIPS, the propagating plants by Slips.

Great numbers of plants, both woody and herbaceous kinds, are propagated plentifully by Slips; and the method is very easy as well as very expeditiously performed.

It is effected in the woody kinds by slipping off small young shoots from the sides of the branches, &c. with the thumb and finger, instead of cutting them off with a knife, though we may observe, that there is no material difference, in the success of future growth, between Slips and cuttings, only the former in small young shoots is more applicable to be slipped off by the hand, as above, and are therefore called Slips, which in numerous small, shrubby plants will grow; but is more commonly practised to the lower ligneous plants, such as sage, winter-savory, hyssop, thyme, southern-wood, rosemary, rue, lavender, and most other low shrubby growths, which may with the utmost facility be multiplied by this method: and the best season of the year for effecting the work is generally in spring and beginning of summer, though many sorts will grow if planted at almost any time, from March or April till July; but the proper season for the various plants is always hinted in their culture, under their respective genera.

Observe, in performing the work of slipping these sorts, to chuse the young shoots chiefly of but one year's growth, and in many sorts the shoots of the year will grow the most readily even to plant the same summer they are produced, especially the hard wooded kinds; but in the more soft wooded plants, the Slips of one year's growth will also often readily grow; being careful always to chuse the moderately growing side-shoots situated on the outward part of the plants, from three to six or eight inches long, slipping them off close to the branches, and clear off the lower leaves; then plant them either in a shady border, if in summer, and watered, or so as they can be occasionally shaded in hot sunny weather, especially small Slips, inserting the whole two parts of three in the ground, giving occasional water, in dry warm weather, till properly rooted; and then towards autumn, or in spring

spring following, transplant them where they are to remain.

But in planting Slips of the shoots of tender shrubby exotics of the green-house and stove, many sorts will require aid of a hot-bed or bark-bed, to promote their emitting roots more effectually, which is generally intimated in their culture, under their respective genera: but some others of the shrubby kinds, such as geraniums, will root freely in the natural earth in summer; and many of the herbaceous tribe, producing bottom rooted off-sets for Slips, as in aloes, &c. will also readily grow, either with or without a hot-bed; only we may observe, where there is convenience of hot-beds, as above, in which to plunge the pots of Slips of tender plants, it runs them off more expeditiously; and most of the hot-house plants in particular require that assistance.

Many shrubby plants growing into large bunches from the root, both of the small under-shrubby kinds, as thyme, savory, hyssop, sage, &c. and in those of larger growth, such as roses, spiræas, raspberries, and numerous other sorts, all of which may be slipped quite to the bottom into separate plants, each furnished with roots, and may be planted either in nursery-rows, or at once where they are to remain.

As to the slipping of herbaceous plants, numerous sorts multiply by the root, &c. into large bunches, which may be slipped into many separate plants; and it is effected by slipping off the increased suckers or off-sets of the root, and some sorts by the off-sets from the sides of the head of the plants, and some few sorts by Slips of their bottom shoots, and some of those above, of the stalks and branches in plants of bushy growth; but the greater part by slipping the roots, as in many of the bulbous-rooted tribe, and numerous fibrous-rooted kinds.

The slipping of the bulbous plants is performed in summer when their leaves decay, and the roots being then taken up, slip off all the small off-sets from the main bulb, and the Slips and off-sets should generally be planted again soon in nursery-beds for a year or two. See **BULBUS**.

And as to the fibrous-rooted sorts, the slipping should generally be performed in the spring, or early part of autumn, which may be effected either by slipping the out-side off-sets with roots, as the plants stand in the ground; or to perform it more effectually, may take the whole bunch of plants up, and slip them into several separate parts, each Slip being furnished also with roots, planting them, if small, in nursery-rows for a year, to gain

strength; or such as are strong may be planted at once where they are to remain.

Farther particulars of the method of slipping plants is mentioned in the culture of the different sorts under the proper heads.

SMALL SALLAD HERBS.

Several young seedling-herbs of a warm nature are in estimation for Small Sallading to mix with the larger principal Sallad Herbs, as observed on a former occasion, such as lettuce, endive, and celery, in order to improve their flavour and wholesome quality.

The sorts therefore in general estimation as Small Sallad Herbs, are cresses, mustard, radish, rape, and turnep; also sometimes lap-cabbage-lettuce for winter and early spring use; all of which herbs, considered as Small Sallading, are always in perfection as such, when quite young, that is, not more than a week, or ten or twelve days old, whilst they remain mostly in the seed-leaf, being then cut up close to the ground for use; for they being mostly of a warm relish, in which consists their chief excellence for winter and spring Sallads, if suffered to grow large, and come into the rough leaf, they become of a disagreeable, strong, hot taste; but being used when only in the first young leaves, as just above observed, they eat exceedingly tender with an agreeable warm flavour, highly relishing to most palates, which renders them eminent furniture to mix in all winter and spring Sallads particularly; but from June till September they are not so generally regarded, though many persons are fond of them at all seasons of the year, and in default of other Sallad Herbs many often use them alone as Sallading in the winter and spring months; they, however, are preferable when mixed with lettuce and the other principal Sallad Herbs. See **SALLAD HERBS**.

Let it be observed, that as all the above-mentioned Small Herbs belong to different genera, besides their uses for Sallads, several of them are also cultivated for other useful purposes, all of which is hinted, together with their proper culture for their several uses under their respective genera; but considered as Sallad Herbs, they require a particular culture, and we therefore judged it eligible to exhibit their culture for that purpose under this head, *Small Sallad Herbs*, and, as such, the same culture serves for all the sorts, they being all raised from seeds at various sowings the year round, as directed in their culture below.

Observe, therefore, that for the purpose of Sallading they may be obtained young at all times of the year, in spring and summer in the

the open ground, and in winter under shelter of frames and glasses, and occasionally in hot-beds.

General Observations on their Culture.

They are all raised from seed, which, for Sallading, is sown at all times of the year, when they are required; in the open ground, from March till October or November; and in the winter months they will require shelter of frames and glasses, &c. and the assistance of hot-beds occasionally, as we before noticed: and where a constant supply is required, a repetition of sowing will be requisite every week, or ten days, or a fortnight, according to the season of the year and the demand for use, being sown generally in flat shallow drills, very thick, and only just covered with earth, and are also sometimes sown all over the surface, especially upon hot-beds.

But as they require somewhat different culture at different times of the year, we will explain it under different heads accordingly, viz. *Spring Culture, Summer Culture, Winter Culture.*

Spring Culture.

In the spring-culture of Small Sallading, it may be raised both in the open borders and in hot-beds occasionally, according as it may be required, early or late, but when it is required as early as possible, it must either be sown in hot-beds under frames and lights, &c. or, in default of a hot-bed, in a bed or border of natural earth under glasses.

First the early culture in Hot-beds.—You may begin to sow in hot-beds any time in January or February, and when a considerable supply is daily required, may continue sowing every week or fortnight in hot-beds till March, or during the cold weather. Let a moderate hot-bed of dung be made for one, two, or more garden frames, only half a yard or two feet depth of dung, according to the temperature of the season, as the heat is only required to bring up the plants quickly; and forward them a week or two in growth; place a frame thereon directly, and mould the bed all over with light rich earth, five or six inches thick, making the surface level and smooth; then if you would forward your Sallading as much as possible, you may directly sow the seed; which may be effected either in drills as shallow as possible, about two or three inches broad, and flat at the bottom, and three inches asunder, sowing the seeds of each sort separate and very thick, so as almost to cover the ground, and only just cover them with earth: or, to make the most of the bed, may sow the seed all over the surface, previously smoothing it lightly with the back of the spade, then sow the seeds all over the bed, the different sorts separately,

and all very thick, as just observed; and after pressing them all even and lightly down also with the spade, cover them very thinly with earth, by sifting over as much light mould as will only just cover the seed, as aforesaid; and as soon as the sowing is performed in either method, put on the lights: the seeds will quickly germinate, and will come up in two or three days or less, being careful at this time to give vent to the steam arising in the bed, as well as indulge the plants with plenty of free air daily, either by tilting the lights in back or front, according to the temperature of the weather, or by drawing the lights a little down, or taking them quite off occasionally in mild days at first; for the hot-bed being yet new, there will be a considerable steam arising; and the Sallading coming up very thick, unless due vent is given to pass off the steam and admit fresh air, they will be apt either to burn, or fog (as the gardeners term it), and mould off as fast as they come up. Such hot-beds, however, that are not fresh made, do not require all this precaution; but in new-made beds it must be strictly observed till the Sallading is all fairly come up, and as long as the strong steam continues; and the plants will be fit for use in a week or ten or twelve days from the time of sowing.

Thus continue to repeat the sowing in hot-beds every week or fortnight during the cold weather; the same hot-bed sometimes retaining its heat, will admit of two sowings, by sowing again as soon as the first crop is gathered; however, to obtain a regular supply daily, continue to make fresh hot-beds occasionally, sowing and managing them as above.

Sometimes where only a small quantity for family use may be wanted at a particular time as soon as possible, and that you have the convenience either of cucumber and melon hot-beds, or a hot-house, &c. some seed of each sort may be sown in pots or boxes, and placed in the said hot-beds or stove, just to bring up the plants fit for use; which on some particular occasion may be sufficient without making a hot-bed on purpose.

For want of frames and lights to place over the hot-bed, may use hand or bell-glasses, or arch the bed with low hoop-arches, in order to cover with mats every night, and in bad weather.

Or in default of hot-beds, in cold weather early in the spring, may prepare part of a warm border, or a bed of light earth in a sunny situation, for some garden-frames and lights, hand-glasses, &c. raising the ground somewhat to the sun; and having dug it, and raked it fine, then sow the seed either in shallow

low drills, as before observed, or all over the surface in the manner as directed also in the hot-bed culture; covering it lightly with earth, and having set on the frames and glasses, the seeds will soon come up, and the Sallading will be ready some considerable time sooner than in the open ground.

Their Culture in the full Ground.—From about the middle or end of February, or beginning of March, according to the forwardness or mildness of the season, may begin sowing Small Sallading in the open ground, repeating the sowings every week or ten days; the first sowing being performed on a warm border; and continue sowing in that situation till the beginning or middle of April; then it may be sown in any of the open quarters, and in which the sowings may be repeated weekly, or once a fortnight, as may be required; but according as the hot weather approaches, should rather sow in a somewhat shady situation.

Let the ground for each sowing, in the different situations, be properly digged, and the surface raked smooth.

And as to the method of sowing in the open ground, it is most commonly in shallow drills, which should be drawn with a small hoe either with the corner, or held edge-ways downward, horizontally, drawing the drill along evenly, as shallow as possible, and flat or level at bottom, at three or four inches asunder, in which sow the seed evenly all along the bottom, each sort separate, and very thick, covering them in evenly with the finest of the mould, not more than a quarter of an inch deep; or if the smaller seeds are but just covered it is sufficient; for the seeds being sown very thick, if deeply covered with mould, the plants will not be able to rise regularly.

Observe in the early spring sowings in the open ground, that in cold nights and all bad weather, it is eligible to cover the ground, both before and after the plants begin to rise, with large mats, which will be better if supported on low hoop-arches, or ranges of pegs stuck in the ground, just high enough to support the mats a little from the earth; and by assistance of this covering occasionally in the early sowings, you will insure a more effectual crop, as well as forward the Sallading some days.

Remark, likewise, of the later sowings, when the dry warm weather commences, it is proper to give occasional waterings.

Observe farther, that as Small Sallading being always sown extremely thick, and the plants consequently coming up very close together, and the ground being sometimes by means of wet, &c. crusted or caked at top, so as

they cannot readily make their way through separately, in which case it is proper to whisk the surface of the earth lightly with the hand, or slightly touched along with a light rake, or the end of a birch broom, just to break and separate the mould a little.

Summer Sowings.

Small Sallading is not in general esteem during the hot weather in summer, from the middle or end of May until September.

However, some require it all summer long, and it may be sown in any open situation from May till September: observing, however, that during the hot dry weather, it should either be sown in some shady borders, or shaded with mats in sunny days during the greatest heat, from about ten till four o'clock, till the seed come up: and the sowings should be repeated every ten or twelve days; but as in summer these herbs soon become very hot-tasted, to have them perfectly young and tender, it is advisable to repeat the sowings every week in very hot weather.

The sowings are to be performed in shallow flat drills, as observed in the *Spring Sowings*, in the open ground, the seed sown very thick, and but lightly covered with earth, for the reasons formerly given.

And in very dry weather give daily waterings both before and after the plants begin to appear.

Autumn and Winter Culture.

From September to January, February, or March, is to be understood for the *Autumn and Winter Culture* of Small Sallading; the first part of which time it may be obtained in the open ground; but as soon as the cold weather sets in, it must be raised under glasses, and in hot-beds occasionally.

We may continue sowing in the open ground all September and October, also occasionally in November in mild seasons; observing, that until towards the middle of October we may sow them in any open situation; but from the middle or latter end of October, and in November, the sowings must be on warm south borders, performing the sowings, as before advised; and in cold nights bestow a covering of mats, or hand-glasses, &c. repeating the sowings every week, or ten days, or a fortnight, as occasion requires.

But when the cold weather commences in November, &c. it is advisable to use garden-frames and lights, or hand or bell-glasses, choosing a spot of light, rich ground in a sunny situation, sowing the seeds either in drills or all over the surface, according to the former directions, using the shelter of the frames and glasses as above; and thus you may raise plenty

plenty of Sallading, almost any time in winter, in mild weather; but when frost comes, recourse must be had to hot-beds.

However, in default of hot-beds to raise a constant supply all winter, it may be obtained great part of that season, sown in the natural earth, under good frames and lights, and other occasional covering, except just during the time of long, severe frosts, when the aid of hot-beds will be necessary: however, in order to raise them as well as possible during winter without the constant aid of hot-beds, let a raised bed or border of light rich earth, in a warm dry situation, be prepared for one, two, or more shallow garden-frames, raising it on the north side six inches, or more, so as to form it sloping to the sun; and having smoothed the surface, set on the frames, sinking the back-part thereof near a foot, that the whole surface of the earth may be within eight or ten inches of the glasses, for it is of much advantage to have the glasses tolerably close to the earth at this season, in order to receive the greater influence of the sun's heat, more especially when without hot-bed heat at bottom. The seed may here be sown either in shallow flat drills, ranging from the back to the front of the frame, three inches asunder, as in the spring sowings, or may be sown all over the surface, patting it lightly down with the spade, and then just cover it with earth as thinly as possible; directly put on the lights, and keep them close, and the plants will soon come up; repeating the sowings once a week or fortnight; and thus you may continue a constant succession of young Sallading most part of the winter; observing, in very cold weather, to line the frames closely about with dry litter; also every cold night, cover the glasses with mats or litter: though, in severe frosty weather, recourse must be had to the assistance of hot-beds, as below.

By aid of hot-beds a plentiful supply may be had in all weathers, making slender dung hot-beds, for frames and glasses, as observed in the early spring sowings, performing the sowing also, as there directed, and manage the bed in the same manner; being careful in time of severe frosts to line the frame all around close with dry litter, covering the glasses also every night with the same material, or with garden mats.

Thus far is the whole practical method of raising a plentiful supply of Small Sallading at all seasons of the year.

In gathering Small Sallading for use at all times of the year, let it always be used when quite young and in the seed-leaf, before they grow large and send forth rough leaves, more

especially the mustard, radish, and other rough-leaved kinds; and when thus young, they may be cut up quite close to the ground, stalks and top together, all of which will then eat very tender and palatable.

But when they become large, and the rough leaves begin to advance apace, they are unfit for Sallading, as being rank and hot to the taste, so should have always young successions.

Though cresses in particular, being of a different nature of growth from the mustard and radish kinds, are sometimes retained, in case of omitting sowing in proper succession, as they will shoot up again in small fresh leaves, which being gathered young, serve occasionally in default of a successional supply of young seedling plants; but are not eligible for any long continuance in this production, as the leaves will become tough, and rankly hot-tasted; so should generally raise fresh supplies from seed, as above advised.

To save seed of all the above sorts of Small Sallading, should generally sow a portion of each for that purpose, more or less, according to the demand of a family, &c. or in proportion where large quantities of the seed are intended for public supply; and the proper season for sowing for this occasion is March and April, either broad-cast and raked in lightly, or in drills, six or eight inches asunder, each sort separate; they will shoot up to stalks in May and June, and the seeds will ripen in July and beginning of August. See each sort under its proper genus.

SMILAX, Rough Bindweed.

This genus consists principally of shrubby climbers, mostly of the ever-green tribe for the shrubbery, &c. rising with trailing and cirrhone-climbing stalks, mounting by support many feet high, adorned with heart-shaped, oval, and lanceolate leaves, in the different species, and apetalous, dioecious flowers.

Class and order, *Diaecia Hexandria*.

Characters.] CALYX, male and female flowers on separate plants, having bell-shaped, six-leaved, spreading cups, which in the females are deciduous. COROLLA, no petals. STAMINA, six filaments, with oblong antheræ in the males. PISTILLUM, an oval germen, three very small styles crowned by oblong, reflexed, downy stigmas in the females. PERICARPIUM, a globular, trilocular berry, having two globular seeds.

There are above twenty species of Smilax, mostly of a shrubby, climbing growth, some hardy, and some of tender nature; but it is principally some of the hardy kinds that are esteemed for culture in our gardens, having long trailing stalks, some armed with prickles,

others are inermous, or unarmed, and mostly climb by means of cirrhi, or clasps, upon the adjacent trees and bushes, many feet high; which renders them proper furniture for extensive shrubberies, thickets, and shady plantations, &c. are all exotics from different foreign countries, both in Europe, Asia and America; and the following are the most noted species, consisting of several shrubby climbers, and one herbaceous kind, all for hardy plantations, and some shrubby sorts for the greenhouse, &c.

Hardy Kinds.

Of these sorts the first seven are shrubby, and the eighth is an herbaceous plant, all of the climbing tribe.

1. SMILAX *aspera*.

Rough Spanish Smilax, or Common Rough Bindweed.] Rises with many long, slender, angular, trailing, prickly stalks, climbing ten or twelve feet high; heart-shaped, indented, prickly leaves, having nine longitudinal nerves, and small bunches of white flowers at the sides and ends of the branches, succeeded by rough red berries.

Variety.] With black berries.

2. SMILAX *Sarsaparilla*.

(Sarsaparilla)—or Medicinal Virginia Rough Bindweed.] Rises with angular, prickly, climbing stalks; oval, obtuse, trinervous, smooth leaves; and small bunches of white flowers at the axillas, succeeded by red berries.

3. SMILAX *tamnoides*.

(Tamnus-like)—or Black-Briony-leaved Carolina Rough Bindweed.] Rises with cylindric, prickly, climbing stalks; large, oblong, heart-shaped, septemnervous, smooth leaves; and at the sides of the stalks loose bunches of whitish flowers, succeeded by black berries.

4. SMILAX *laurifolia*.

Bay-leaved Virginia Rough Bindweed.] Rises with round, prickly, trailing, climbing stalks; oval-lanceolate, thick, stiff, smooth, trinervous leaves; and at the sides of the stalks round bunches of flowers, succeeded by black berries.

5. SMILAX *excelsa*.

Lofty-climbing Oriental Smilax.] Rises with angular prickly stalks, climbing to the tops of the highest trees; heart-shaped, smooth leaves, having nine nerves; and at the axillas, small bunches of whitish flowers succeeded by red berries.

6. SMILAX *lanceolata*.

Lanceolate Virginia Smilax.] Rises with round, inermous stalks; lanceolate, or spear-shaped, smooth leaves; and small clusters of flowers succeeded by red berries.

7. SMILAX *rotundifolia*.

Round-leaved Canada Smilax.] Hath cylindric, prickly, climbing stalks; roundish, heart-shaped, acuminate, smooth leaves, having seven or five nerves; and small bunches of flowers, succeeded by small fruit.

8. SMILAX *herbacea*.

Herbaceous Virginia Smilax.] Hath herbaceous, angular, inermous, climbing stalks; oval, septemnervous, smooth leaves; and umbellate bunches of flowers, succeeded by small berries.

Green-House Kinds.

They are ligneous climbers, like the others, but in winter require the shelter of a greenhouse.

9. SMILAX *China*.

China Rough Bindweed, or China Root.] Hath a thick, fleshy root; cylindric, prickly stalks, climbing near twenty feet high; oval-heart-shaped, quinquenervous, unarmed leaves; and at the axillas of the stalks, bunches of small flowers, succeeded by red berries.

10. SMILAX *Pseudo-China*.

Baslard China Root.] Hath a large fleshy root; cylindric, inermous stalks, garnished with heart-shaped, inermous leaves, those on the branches being oblong-oval, and quinquenervous; and at the axillas, bunches of small flowers, succeeded by red berries.

All the above ten species of *Smilax* flower mostly in June and July; which in all the sorts are apetalous, and male and female on separate plants, produced commonly in bunches from the sides of the branches; are small and make no ornamental appearance, and the female flowers are succeeded by berries, but they rarely ripen in England.

These plants are perennial in root, and all the woody kinds are durable in stalk, and mostly retain their leaves the year round.

Their roots are mostly composed of many fleshy fibres spreading widely on every side, sending up many trailing stalks, which in most sorts being furnished with cirrhi, they thereby mount upon any neighbouring support.

In their native soil abroad, they grow naturally in woods and hedges, and thrive best under the shelter, shade, and support of trees and bushes.

The hardy sorts therefore are singularly adapted as furniture for thickets, groves, wildernesses, and borders of wood walks, planting them towards the front between the trees and shrubs, where they will run and spread very agreeably, exhibiting themselves as ever-greens all the year.

And the tender sorts being potted and placed in the green-house collection, allowing them support to climb upon, they will effect a proper diversity.

Method

Method of Propagation.

First the hardy kinds.—They are propagated by slipping the roots, by layers, and by seed.

By slipping the Roots.—Many stalks rising from the roots widely around, the outer young ones of which may be readily slipped off with roots to each, which being performed in autumn or spring, may be planted either in nursery rows for a year or two, or at once where they are to remain.

By Layers.—The stalks being layed in autumn, &c. they will be well rooted and fit for transplanting by autumn following.

By Seed.—This is commonly obtained from abroad by the seedsmen in the spring, which may be sown, some in pots, and plunged in a hot-bed to forward their germination, otherwise they are apt to remain a year or more before they grow; and some may be sown in the full ground near the shade of shrubs, &c. in a bed of light dry earth, in drills, thinly, and covered about an inch and half deep, marking each row with a stick, because they will probably not come up till next year; giving however the common nursery care of weeding and watering the pots or beds till the plants are come up, which should have occasional shelter in frosty weather, and when two or three years old may be planted out, finally to remain.

Tender kinds.—Both the tender species may be propagated by layers, and by dividing the roots. Perform the laying in spring on the young shoots, which by autumn or spring following will be fit for potting off separately: and by roots, these being slipped in March or April, and the off-sets potted separately, will soon take root; managing the whole as other woody exotics of the green-house.

SMYRNIUM, Alexanders.

The plants are large herbaceous biennials and perennials, one of which is occasionally cultivated in the kitchen-garden as a culinary herb, used for stewing, fallads, &c. they all rise with large compound, triternate, and pinnated, many-lobed leaves from the root, and erect stalks, several feet high, crowned with umbels of flowers.

Class and order, *Pentandria Digynia*.

Characters.] CALYX, umbellate flowers, having the general umbel unequal, and the smaller ones erect, without any involucre, and scarcely visible cups.—COROLLA, a uniform, general umbel, composed of numerous florets, having each five spear-shaped petals. STAMINA, five small filaments with simple antheræ. PISTILLUM, a germen under each floret, two styles, having simple stigmas. PERICARPIMUM, none; a nearly globular,

streaked, two-parted fruit, with two moon-shaped seeds.

There are several species, biennials, and perennials, mostly plants of but little merit; one sort, however, a biennial, being formerly in estimation as a culinary herb, we will give its description and mode of culture, &c.

SMYRNIUM *Olusatrum*. (*Biennial*.)

Common Alexanders.] Hath a largish, down-right, white, fibrated, biennial root, sending up several large, triternate, many-lobed leaves, and upright stalks, dividing and branching four or five feet high, garnished with ternate, serrated leaves, having foot-stalks, and all the branches terminated by large umbels of white flowers.

This plant is a biennial, and is raised commonly from seed, which rising in spring with large leaves, remains till spring following, then shoots up stalks for seed, and perishes in autumn after.

The whole plant is of a strong, warm, somewhat aromatic nature.

It being blanched like celery is then fit for use as a culinary plant, and is also used for medicine without blanching; its leaves and seeds being used for that purpose.

It is propagated by seed sown in the spring in any light soil and open situation, in shallow drills, fifteen or eighteen inches asunder; and when the plants are come up two or three inches high, thin them to six or eight inches distance in the rows, to give them room to shoot up strong; when earth must be drawn up about them gradually, in order to blanch or whiten them a little below, and that they may be more crisp and tender for autumn and winter use; but as, in spring following, they will shoot out again vigorously, let some earth be hoed up close about each plant, and in three or four weeks they will be blanched for use.

SOIL, see EARTH, COMPOST, DUNG, MANURE, &c.

SOLANUM, Night-shade, comprehending also the Love-Apple and Potatoe.

This genus furnishes many herbaceous and shrubby plants for ornament and variety, and some herbaceous esculents for domestic use; consisting of annuals and shrubby perennials for adorning the pleasure ground, green-house, and stove collections, and herbaceous culinary plants for the kitchen-garden; some being long trailers, others are of erect growth, garnished with pinnated and simple leaves in the different species, and all the sorts adorned with small, rotated, five-parted flowers, succeeded by roundish, soft, baccaceous fruit, of various shapes, sizes, and colours, in the several species,

cies, &c. being in some sorts as large as apples and eggs, in others like cherries, and in some as small as currants; exhibiting in the whole a great diversity in their different growths, flowering, and fruiting, some proper to cultivate for variety and ornament, in their general growth, others, as singularly curious in the appearance of their fruit; some also, (*Love-apple*) for its said fruit to use as an esculent in culinary purposes, and some as most valuable esculent rooted plants, particularly that admirable species, the *Solanum tuberosum*, or Potatoe, for its large, tuberous, edible root, which is obtained for use, very beneficially, the year round.

Class and order, *Pentandria Monogynia*.

Characters.] CALYX is monophyllous, cut half through into five acute segments, and is permanent. COROLLA is monopetalous and rotaceous, having a short tube below, with a large, spreading, plicated limb, dividing into five spreading, pointed segments. STAMINA, five small connivent filaments, terminated by oblong, connivent anthers. PISTILLUM, a roundish germen, slender style longer than the stamina, having an obtuse stigma. PERICARPium, a roundish and oval bilocular fruit of the berry kind, of various sizes and forms in the different species, &c. and is filled with many roundish compressed seeds.

To this genus *Solanum* is now added the *Lycopersicon*, or Love-Apple, the *Melongena*, or Egg-Plant, and the *Potatoe*; they being found to be all of the Night-shade tribe, both in the characters and quality, which, according to Linnæus, is supposed to be more or less poisonous, not excepting the Potatoe, though in a very small degree; and may be said to be the wholesomest of all the sorts of Night-shade; there being numerous different species, ten or twelve of which are cultivated in the English gardens for variety and use; consisting of some herbaceous annuals, and one shrubby perennial for the pleasure-garden, &c. a few shrubby exotics for the greenhouse and stove, and herbaceous annuals and perennials for the kitchen-garden.

Annual Kinds for the Pleasure-ground.

The principal sorts are the Love-Apple and Egg-Plant, there being many other annual sorts of less note; some are common weeds in our gardens, particularly the common black-berried Night-shade, comprehending many varieties; however, the most material annuals under this head are the following.

1. *SOLANUM Lycopersicon*.

(*Lycopersicon*)—or *Wolf's Peach*, commonly called *Love-Apple*, or *Tomatoes*.] Rises with strong, herbaceous, unrimed, procumbent

stalks, branching numerously six or eight feet long; large, pinnated, rank-scented leaves, of four or five pair of cut lobes, and an odd one; and simple racemous clusters of small yellow flowers at the axillas, succeeded by large, roundish, depressed, furrowed, soft, red fruit.

Varieties are,] Common large-furrowed-fruited Love-Apple—Cherry-fruited Love-Apple, having smooth, round, red fruit the size of large cherries—Yellow cherry-fruited—Scentless leaved—Burnet-leaved.

This species and varieties are all of large trailing growth, and flower in June, July, and August, and the fruit ripens in September and October, when they appear both ornamental, and are fit for culinary uses, particularly the common large-fruited kind, which is in high estimation in some families for improving soups, also for stewing, and sauces, &c. likewise, both in its green and ripe state for pickling; for which purposes they are highly valued by the Spaniards and Portuguese in particular, by which people they are commonly called *Tomatoes*: so that this species is employed both as an esculent and ornamental plant; and in both cases its chief merit is in the fruit.

It is an annual in this country, whatever it may be in its native soil, which is the hot parts of America, but is hardy enough to succeed here in the open air in summer, being previously raised in hot-beds, thence transplanted; and as being of very rampant trailing growth, require the support of walls, pales, or stakes, which should also be in a sunny situation, otherwise the fruit will not ripen freely.

2. *SOLANUM æthiopicum*.

(*Æthiopian hard-fruited Love-Apple*.) Rises with erect, smooth, herbaceous stalks, dividing and branching half a yard high; garnished with oval repand-angular leaves, and drooping pedunculi from the sides of the branches, each bearing one white flower, succeeded by round, striated, firm, red fruit.

3. *SOLANUM Melongena*.

(*Melongena*)—or *Egg-fruited Night-shade*, commonly called *Egg-plant*, sometimes *Mad-Apple*.] Rises with an erect, thick, firm, herbaceous stalk, branching erectly two or three feet high; large, oval-oblong, entire, downy leaves; and blue flowers singly from the sides of the branches, having prickly cups, succeeded by large, oval, egg-like, pendulous fruit of different colours in the varieties.

Varieties are,] Common white-fruited Egg-plant,

plant, having large, white, fleshy fruit, the size and shape of a very large egg—purple-fruited Egg-plant—red-fruited—yellow-fruited—prickly-fruited, &c.

This singular species and varieties are all of upright firm growth, branching and forming full heads, well garnished with fine large leaves, and flowers in June and July, and the fruit attains perfection in August and September, being all of the large egg-shape; but the white-fruited sort is in most esteem as a curiosity, for its very great resemblance to a hen's or swan's egg, effecting a singular appearance as they grow on the plants; and in some warm countries in the south of Europe they are very commonly eaten, and are accounted wholesome: in England, however, they are not at all relished, so that the plants are cultivated only as a curiosity, and, as such, highly merit culture in the pleasure-garden.

These plants being natives of Asia, Africa, and the warm parts of America, require to be raised and forwarded in hot-beds in this country.

4. *SOLANUM nigrum*.

Common Black Night-shade.] Rises with an upright herbaceous stalk, branching a yard, or two or three feet high; oval, angular-indented leaves; and from the sides of the branches roundish nodding umbels of white flowers, succeeded by black and other coloured berries in the varieties.

This common black Night-shade is chiefly used as a medicinal plant; it grows wild in gardens, fields, and dung-hills in England, and most parts of the world, often becoming a troublesome weed, so is rarely cultivated; it, however, comprehends several varieties which were formerly considered as distinct species, but prove to belong all to the *Solanum nigrum*, having all oval leaves, and nodding umbels, and are sometimes cultivated in gardens for variety.

The different varieties are,] Common black-berried Night-shade, as above—large, upright, spreading, black Night-shade—greenish-yellow-berried—red-berried—villous, yellow-berried, with round, hairy branches, and angular somewhat hairy leaves—Guinea black-cherry-berried, with angular dentated branches, and smooth entire leaves—Virginia, upright, black-berried, with angular branches, and repand smooth leaves—Jew's black Night-shade, with prickly branches. All of which produce their flowers in nodding umbels in summer, succeeded by umbellate clusters of berries in autumn.

All the above four species and varieties are

herbaceous annuals, being mostly but of one summer's duration, particularly the Love-apples and *Melongena*; but several of the varieties of the *Solanum nigrum* will often continue all winter, if potted and placed in the green-house: however, an annual supply of the principal species should be raised every spring from seed; remarking, that the first three species, being exotics from hot countries of Asia, Africa, and America, require to be raised in hot-beds in spring for transplantation into the full air in summer; but the fourth sort being hardy, most of its varieties may be raised in the open ground.

Most of the above annuals may be employed in the pleasure-ground for variety, more particularly the Love-apples and Egg-plants; and the former also as culinary plants for their fruit as aforesaid; but the *Melongena*, or Egg-plant, having great singularity in their egg-like fruit, merit a place in every curious garden: as to the *Solanum nigrum*, or Black Night-shade, the common sort is never cultivated; but some of its best varieties may be admitted in large gardens to increase the variety; and if some are also planted in pots, trained up straight, and placed in the green-house in October, they will remain green all winter, and exhibit an agreeable variety during that season, with their umbels of ripe fruit.

Their Propagation and Culture.

As to the propagation and culture of all these annual Night-shades, they are all easily raised from seed sown annually in the spring; the three tender kinds in hot-beds, for transplantation in May or June, and most of the varieties of the *Solanum nigrum* in a warm border in April, also for transplanting.

For the tender kinds, Love-apples, and Egg-plant, prepare a moderate hot-bed in March or April, serving for these and other tender annuals, covered with a frame and lights, and moulded over within the frame with light rich earth six inches thick, or may sow them in any hot-bed already made for other plants, such as cucumber beds, &c. provided there is room, sowing the seeds either in the earth of the bed in small drills, or in pots and plunged in the hot-bed; and when the plants come up, indulge them with fresh air and occasional waterings, in common with the other plants of the hot-bed, and thin them where they stand too thick, that they may have room to gather some strength previous to their transplantation; or if they are pricked out upon a fresh hot-bed, it will forward them considerably, which is more particularly necessary for the Egg-plants.

Observe,

Observe, however, of the Love-apple kinds; in particular, that towards the latter end of May, when the plants are from about four to six or seven inches high, and the season is become tolerably warm and settled, plant them out finally in the full ground on some warm border, placing them singly at some considerable distance, on account of their large spreading growth; planting some also against a south fence, &c. to have the full sun, as well as for the advantage of training their trailing branches along regularly; for, unless they have support, they will trail upon the ground, and over-spread the neighbouring plants, and not ripen their fruit; but being trained against some sunny fence like a wall-tree, or to a treillage or stout stakes, they will show themselves to proper advantage, and ripen their fruit more early and perfect, and exhibit it more ornamentally.

But the *Melengenas* being raised as above in a hot-bed, it is also advisable to forward them as much as possible by the farther aid of one or more hot-beds, in order to run the plants up to a large growth, and exhibit themselves and fruit in full size and perfection.

Therefore when those seedling egg plants are one or two inches high, having a fresh hot-bed ready, prick them therein about four inches asunder, or plant some in small pots singly, and plunge them in the hot-bed, giving water and occasional shade from the sun till they are fresh rooted, repeating the waterings as occasion requires, and admit a due portion of fresh air every mild day by tilting the upper ends of the lights; then, when the plants have been forwarded about a month in this bed, some may be thinned out with balls to their roots, and placed upon another hot-bed six or eight inches asunder, managing them as before; it will still forward them more considerably to a large stature for flowering and fruiting in perfection; observing, as they advance in height, to raise the frame by degrees in proportion: likewise in their advanced growth, and as the warm season approaches, begin to harden them gradually to the open air, in fine days; and towards the middle of June, the plants being grown tall and strong, and the season become warm and settled, they should be removed into the full air, finally to remain: when those growing in the earth of the bed may be taken up, with balls of earth to the roots, planting them either in the borders or in pots; and those already in pots may be shifted into larger, and placed to adorn fore-courts, or any other conspicuous compartments, where they will effect a cu-

rious variety, with their egg-shaped fruit, all the autumn season.

The hardy kinds, consisting of several varieties, (*Annuals*) the offspring of the *Solanum nigrum*, or Common Black Night-shade, are easily raised from seed, sown in the latter end of March or in April, mostly in a bed or border of light earth, separately, in small shallow drills, and the plants, when about three inches high, planted out about the borders and in pots: or they may be sown at once where they are to remain, in patches in the different compartments, and the plants afterwards thinned to one in each place; or may sow some of the foreign varieties, in particular, in a hot-bed, to raise and forward them more effectually, planting them out as above.—Thus, in either method, they will arrive to a flowering state in July, and produce their umbels of berries in autumn; observing, if designed to keep any of the more curious sorts as long as possible, they must be potted, and placed in the greenhouse, where they will remain all winter.

Hardy Shrubby Kinds.

There is one hardy shrubby species, comprehending some varieties, mostly wild climbing plants of the hedges, in England and most parts of Europe, but are retained in many gardens for variety.

5. *SOLANUM Dulcamara.*

Bitter-sweet, or Climbing Woody Night-shade.

Rises with long, flexuous, inermous, woody stalks, climbing, by support, many feet high; oblong, pointed leaves, with the upper ones halberd-shaped; and cymose clusters of small blue flowers, succeeded by bunches of small, oval, red berries.

Varieties.] Common blue-flowered, as above — White-flowered — Variegated white-striped-leaved — Gold-striped-leaved — African thick-leaved, formerly ranged as a distinct species, but proves to be only a variety of the *Solanum Dulcamara*.

They all flower in June, July, and August, and the berries ripen soon after.

All the varieties of this species are of the climbing tribe, and durable in root and stem, &c. but deciduous in leaf. The common sort grows wild in field-hedges, in most parts of Europe, climbing over the neighbour plants; and is often cultivated in shrubberies as a climber, in assemblage with the variegated sorts.—But the variegated kinds are in most esteem as garden plants, for the beauty of their elegant striped leaves, and are therefore much employed as climbers.

As to the African thick-leaved variety, it being tender, requires to be potted, and treated as a greenhouse plant.

All the hardy varieties, however, i. e. the common, and two striped kinds, &c. will grow freely almost any where in the full ground: the common sort, in particular, will succeed also in any close place, so is often planted even in towns and cities; and all these sorts, considered as climbers, are proper furniture for shrubberies, borders of shady walks, &c. groves, and thickets, and to run over arbours; allowing them support of stakes, or placed to climb upon bushes, &c. Allow the variegated sorts generally a dry and rather poor soil, otherwise they will be inclined to grow too vigorous, and become plain, that is, lose their variegation:—They are easily propagated by layers and cuttings, in autumn, winter, or spring, and they will all be well rooted by autumn following, and fit for transplantation, either in nursery rows, or at once where they are to remain.

Shrubby Green-house Kinds.

There are many tender shrubby sorts of the quality of green-house plants, some of which are retained in our gardens for ornament and variety; which being exotics from warm countries, must be kept in pots, in order for moving to shelter in winter.

6. SOLANUM *Pseudo-capsicum*.

(*Bastard-Capsicum*)—commonly called *Amomum Plinii*, or *Winter Cherry*.] Rises with a shrubby, upright, inermous, green stalk, branching numerously and erectly all around, three or four feet high, forming a regular head, garnished with narrow, spear-shaped, repandous leaves; and white flowers, in sessile umbels, from the sides of the branches, succeeded by many beautiful red berries, like cherries, appearing very ornamental all winter.

Variety.] With yellow berries.

Both the varieties are beautiful shrubby plants from Madeira, flowering in June, July, and August, and the fruit ripens in autumn and winter, which in both sorts are of the shape and size of common cherries, but not eatable; appearing very beautiful all the winter season; effecting a pretty variety in the green-house collection.

7. SOLANUM *sodomum*.

Apple of Sodom, Pomum Amoris, or Shrubby African Love-Apple.] Rises with a shrubby, prickly stalk, branching two or three feet high, having the branches also armed with spines; ob-oval, pinnatifid-sinuated, prickly leaves, with the segments obtuse; and large blue flowers in bunches, from the sides of the branches, having prickly calyces; succeeded by large, round, compressed, yellow fruit, the size of a small apple, ripening in winter.

8. SOLANUM *indicum*.

Indian Shrubby Night-shade.] Rises with a shrubby, prickly stem, branching two or three feet high, with the branches also armed with spines; wedge-shaped, angular, entire, somewhat hairy leaves, prickly on both sides; and longish bunches of blue flowers at the sides of the branches, succeeded by round, golden-yellow fruit, the size of cherries; ripening in winter.

9. SOLANUM *verbasifolium*.

Verbasum-leaved, Downy, American Night-shade.] Rises with a shrubby, inermous stem, branching a yard high, or more; oval, entire, downy leaves, and compound umbels of flowers at the axillas of the branches, succeeded by small round berries.

10. SOLANUM *sanctum*.

Palestine Shrubby Night-shade.] Rises with shrubby, prickly stems; oblique, egg-oval, repandous, downy, prickly leaves.

11. SOLANUM *mammosum*.

Dug-fruited Virginia Night-shade.] Rises with upright, herbaceous, prickly stalks; heart-shaped, angularly-lobated, hairy, prickly leaves; and inverted pear-shaped yellow fruit.

12. SOLANUM *quercifolium*.

Oak-leaved Peruvian Night-shade.] Hath angular, flexuose, inermous stalks; oblong, sinuate-pinnatifid leaves, and cymose bunches of flowers.

These seven tender species flower here in June, July, and August; and they all ripen their fruit abundantly in the end of autumn, and in winter.

They are mostly of shrubby growth, durable in root, stem, and branches, and retain their leaves most part of the year. The first two sorts are the most noted of these kinds in the English gardens, but the first sort most of all; however, all the sorts merit culture, to increase the variety in the green-house collection, as they will form a pretty diversity, both in their flowers and fruit, most part of the year, but particularly in autumn and winter, when the fruit ripens, which exhibits a very ornamental appearance.

Their Propagation and Culture.

The propagation of all these green-house sorts is principally by seed in a hot-bed in the spring, and the seed of the principal sorts may be obtained at the nurseries and seed-shops.

Therefore, in March or April, prepare some pots of rich light earth, in which sow the seed thinly, and cover it half an inch deep, and plunge the pots in any common hot-bed, under frames and lights, giving frequent refreshments of water, and the plants will soon come up, when a due portion of fresh air must be admitted daily, together with repetitions of

moderate waterings occasionally; and when the seedlings are about two or three inches high, it is advisable to prick them out upon another hot-bed; which being framed, and earthed six or eight inches deep, plant the seedlings therein, six inches apart, giving water, and shade from the sun, till rooted. It is also eligible to prick some out in small pots singly, and plunge them also in a hot-bed; observing in both methods to give frequent waterings, and admit a large share of fresh air every day, by tilting the lights; and as the warm weather advances, harden the plants gradually to the full air, so as towards the middle or end of June they may bear to be fully exposed; at which time those not potted may be taken up with balls, and planted in proper pots (twenty-fours), and the already potted plants shifted into larger, placing them in the shade for a week or fortnight; managing them afterwards as other shrubby exotics of the green-house.

Tender Shrubby Kinds for the Hot-House.

Under this head is comprised four or five tender shrubby exotics, from the warm parts of America and Africa, and require the aid of a stove to preserve them in this country; so are kept in pots, and placed in that department for variety.

13. *SOLANUM igneum.*

Fiery-thorned American Night-shade.] Rises with a shrubby prickly stem, branching a yard or more high, closely armed with fiery-red thorns; spear-shaped, acuminate leaves, revolute at the base; and simple racemous clusters of white flowers at the sides of the branches, succeeded by red, cherry-like berries.

14. *SOLANUM guineense.*

Guinea Night-shade.] Rises with a shrubby, inermous stem, branching five or six feet high, having also smooth branches; oval, entire leaves, and very slender lateral peduncles, terminated by branches of small white flowers, succeeded by round yellow berries.

15. *SOLANUM tomentosum.*

Tomentose Ethiopian Night-shade.] Rises with a shrubby, tomentose, prickly stem, branching two or three feet high, armed with acerose prickles; heart-shaped, repandous, inermous, woolly leaves; and bunches of small purple-dusted flowers, succeeded by golden-yellow fruit, the size of gooseberries.

This species is remarkable for its tomentose property, it being almost totally covered with down.

16. *SOLANUM bahamense.*

Bahama Night-shade.] Rises with a shrub-

by, prickly stem, branching several feet high, spear-shaped, obtuse, repandous leaves, reflexed in the margin; and simple clusters of blue flowers at the sides of the branches, succeeded by red berries.

17. *SOLANUM trilobatum.*

Trilobate Jamaica Night-shade.] Rises with a slender, shrubby, prickly stem, branching five or six feet high; wedge-shaped, mostly trilobate smooth leaves, and some with five lobes; and small white flowers singly, succeeded by small fruit, the size of elder-berries.

18. *SOLANUM bonariense.*

Bonarian Shrubby Night-shade.] Shrubby stalks; and wedge-shaped sinuated leaves.

All these tender shrubby *Solanums* for the stove collections must always be kept in pots of light rich earth, and retained most part of the year in the stove, except about two or three months in the heat of summer; and thus they will flower annually, and ripen plenty of fruit.

They are all propagated by seed in a hot-bed in the spring; sowing it in pots of light earth, and plunge them in the hot-bed or when the plants are come up two or three inches high, prick them separately in small pots, which plunge also in the hot-bed, or bark-bed, and manage them afterwards as other shrubby exotics of the stove.

Their propagation may also be tried by cuttings: planting them in pots, plunge them in the bark-bed, and cover them close down with a hand-glass.

Hardy, Herbaceous, Esculent Kinds.

Under this head is comprised only one species, Potatoe; having already mentioned a culinary species, among the tender annual kinds, viz. *Lycopersicon*, or Love Apple, sometimes cultivated as an esculent, as well as an ornamental plant; but the most valuable esculent in this genus is the *Tuberous-rooted Night-shade*, commonly called Potatoe, comprehending several varieties, all of hardy temperature, and which, for their fine, large, eatable roots, may be said to be the most profitable culinary esculents in the world, as they may be obtained in great plenty the year round, and are almost universally admired by all ranks of people; and in many countries are become a principal article of food among the common people. But Linnæus, and some other modern botanists, as we formerly remarked, considering all the Night-shades of the lurid tribe of plants, i. e. such whose foliage, &c. assume a gloomy-green colour, of an ominous aspect, thereby suppose the plants to be more or less poisonous; not excepting the potatoe, though in a very small

small degree : and it is said a dullness attends the constant eating of them, and sometimes a griping, more especially when any considerable quantity is boiled and eaten in broth or soups, before the juice has been previously boiled out in another water. However, when Potatoes are thoroughly well boiled, roasted, or baked, they prove a very palatable and wholesome root, either to eat alone, or as sauce to flesh-meat, though they are cooked in various ways, in all of which they are exceedingly profitable for the service of a family.

The botanists admit of only one real species of the Potatoe, comprehending several varieties, as above observed, differing in the form, colour, and other properties of the root, and colour of the flowers.

19. *SOLANUM tuberosum*.

Tuberous-rooted Peruvian Night-shade, commonly called Potatoe.] Hath a tuberous root, emitting numerous fibres, productive of many large roundish, and oblongish, fleshy, edible tubers ; and immediately from the root rise herbaceous, flexuose, smooth stalks, somewhat erectly, a yard long, garnished with large pinnated leaves, of several pair of entire lobes ; and terminated by subdivided peduncles, supporting bunches of small purple, or white flowers, in the different varieties, succeeded by roundish fruit, furnishing ripe seed in autumn.

It is the tubers of the root only of this plant that is eatable ; the fruit, the product of the stalk, is never used in culinary preparations, only sometimes while green to pickle.

Varieties.] It comprehends two principal varieties, viz.—Red-rooted Potatoe, generally producing reddish or purple flowers.—White-rooted Potatoe, commonly bearing white flowers.—Each of which principal varieties comprise several intermediate ones, such as —Round-red—Oblong-red—Pale-red—Dark-red — Rough-red — Smooth-Red — Red and white — Early dwarf-red — Round-white—oblong white—Kidney-shaped white—Large red-ended white kidney-shaped—Early dwarf white—Large conglomerated American Potatoe, being generally clustered together considerably, each root or tuber attaining a prodigious large size, being in estimation principally for feeding cattle.

This species, *Solanum tuberosum*, is supposed to be originally a native of Peru, where the natives of the country commonly call it *Batatas*, and hence it here derived the European name Potatoe.

It may be considered both as an annual and perennial ; observing in the first case, that the same individual root is only of one year's duration ; for being planted in spring, each root

sends out numerous off-sets, becoming proper Potatoes by autumn following, at which time the said parent roots will be almost totally decayed ; hence it becomes an annual : but in the second case, the off-sets of the parent root remaining sound till the next year, when they also furnish an abundant supply of off-sets, hereby the species is perpetuated in great abundance from year to year, and becomes of a perennial nature : remarking, however, that a fresh plantation must be performed every spring.

With respect to the properties of the different varieties of Potatoes for use, there is no very material difference ; though the red sorts were formerly in greatest esteem, and, in our opinion, are equally good as the whites ; though of late years, the Potatoe cultivators about London, and other parts who raise considerable quantities annually, generally prefer the round, and oblong white, or whitish-red sorts and kidney kinds, as being esteemed to be both more prolific in produce, more saleable in market, as well as the finest eating Potatoes, therefore they have almost totally neglected the culture of the fine large red Potatoes, which by many are held superior to the others for richness of flavour. It is, however, proper to cultivate a due share of the best sorts of each kind, all of which are raised in great plenty by cuttings of the roots ; that is, the Potatoes cut into several pieces, and being planted in the spring, each multiplies into a large cluster of new Potatoes, fit for use the following summer, autumn, and winter ; sometimes the early sorts will be fit to take up for use in June or the beginning of July, of the size of large walnuts ; only small quantities at a time in this early growth, just for immediate use, as they will not keep good above a day or two : but towards the latter end of July, and in August, they will be grown to some tolerable size, when they may be taken up in larger supplies ; and in September the roots will have attained almost full growth and maturity, to dig up in more considerable quantities as may be required ; though not in general in the later main crops for long keeping, till October ; so may continue lifting some occasionally as wanted, from June or July, till October aforesaid, or beginning of November, when the main crops will be full grown ; at which period of growth, and not before, they are in the highest perfection ; and the moderately large full-grown Potatoes are considerably finer eating than the small ones, which generally eat waxy, livery, and watery, entirely devoid of that fine rich mealy flavour peculiar to large full-grown Potatoes, nor are they altogether so wholesome for general use.

Observations on their general Culture.

Potatoes may be obtained for use plentifully almost the year round; the early sorts being planted forward in the spring, they often afford tolerable little Potatoes fit to take up in June and July following, as formerly observed, especially in the rich warm grounds about London, where they generally begin taking them up for market in June, before they are a quarter grown, or as soon as they attain the size of good walnuts, and thence continue taking them up occasionally till the general crops arrive to full growth in the latter end of October; both because early Potatoes fetch an extra price, and that the ground may be cleared time enough for the reception of some other crops, such as turneps, cole-worts, cabbage, favoys, &c. for winter, in which there is a double advantage; which may also be practised in private gardens, taking up small quantities at a time, just for the immediate supply of a family; suffering, however, great part of the main crops of Potatoes to remain untouched until September and October, to attain mature growth, and thereby obtain the roots in their ultimate perfection, both for eating and long keeping: for Potatoes that are taken up before they have had their full growth, consequently prove inferior both in size, quality and duration; but some of the main crops being permitted to continue growing till autumn, about the latter end of October, or beginning of November, as above said, till the stalks or haulm begin to decay, the roots will be arrived to full maturity; and being then taken out of the ground in due time, and housed in some close dry apartment, they will keep in good perfection for eating all winter and spring, until the arrival of the new crops next summer.

All the varieties of Potatoes may be cultivated with success in any open situation, both in gardens and the open fields; very considerable quantities being now cultivated in the fields round London, and most other great towns, for the supply of markets, they proving very beneficial crops; and some of the main crops in fields being cleared off in due time, the ground is often sown with wheat, which generally succeeds remarkably well immediately after Potatoes.

As to the American Cluster-Potatoe, it generally grows to a vast size, in a conglomerated or clustered manner, each often weighing several pounds, and at present is cultivated chiefly for feeding of cattle. Its culture is the same as the common sorts, only requires more room to grow.

All the sorts delight in a moderately light

dry soil, and open situation, and if enriched with dung, the greater success may be expected.

The plants are propagated most commonly by the root, *i. e.* the Potatoe, either whole or cut in pieces, each cutting forming a proper set or plant: and being planted in March or April, in rows two or three feet asunder, twelve or eighteen inches apart in the rows, and four or five inches deep, they come up in a month or six weeks after, requiring no other culture than a little hoeing to kill the weeds, and loosen the ground; and each set will thus multiply into a large cluster, just within the surface of the earth, attaining full growth the same year, fit to dig up for use in autumn, continuing good till summer following. See their *General Method of Propagation*, &c.

As Potatoes, therefore, are the most profitable of all our esculent roots, and being of easy culture, their cultivation merits universal attention for the service of families of all ranks, and are now in many places cultivated to great advantage for the supply of the markets, where they always prove a very saleable commodity.

General Method and Season of Propagation, proper Soil, &c. and Method of Planting.

The general method of propagating Potatoes is by the root or Potatoe itself, being the tuberos eatable part of the root, and the only part to plant for propagation; and which may be planted either whole or cut in pieces, as formerly mentioned, and each planted separately at certain distances, directed below.—Potatoes may also be raised from seed, by way of experiment, to gain new varieties: by roots, however, is the only eligible method of propagation for general culture.

First by Roots.—As we above observed, the propagation by roots being by planting the tubers or Potatoes themselves, a proper quantity should be procured in due time in the spring for planting, observing always to procure the finest moderately large roots of the respective varieties for sets; though some use only the small chats for planting; but we have always found that the middling, or full-sized roots, generally yielded the largest Potatoes in return. Likewise observe, that it is of much importance to change your sets; that is, not always continue using those of your own crops, or of any other place constantly, but every two or three years at most procure a fresh parcel of some different distant growth, which will be found of great advantage, both in preventing a degeneracy, and in the goodness of the crops; remarking likewise, the sets

sets, when small, are sometimes planted whole, but more generally each cut in three, four, or more pieces, preserving one or more eyes, or buds, to each cutting: they, however, should not be cut until just the time for planting.

The general season for planting Potatoes is from about the middle or the latter end of February to the middle of April; remarking that the early sorts, &c. for forward crops, may be planted in the latter end of February, and early in March, in a dry warm situation; but for the general crops, March, and the first fortnight in April, is the most eligible planting season; especially in moist land, as if planted earlier, and much wet should succeed, it might rot the sets, more particularly if cuttings: though in cases of necessity, where the ground is not ready, &c. Potatoes may be planted any time in April, or even in May, and will yield tolerable crops by October: however, those planted towards the middle or latter end of March, and early in April, are principally to be depended on for the main crops to attain full perfection.

Observe, as to the proper situation and soil in which to plant Potatoes, always allow them an open exposure, and tolerably dry situation; and as to soil, they are generally the most prosperous in a moderately light pliable ground; none better than a good sandy loam, in which they commonly yield fine crops: however, chuse any the most convenient moderately light land, of a pliant free-working nature, and not wet; and most generally such as has been in constant digging or ploughing before, or occasionally in grass-sward; observing in the former case, that if the ground be rather poor, be sure to bestow a good coat of dung, to be dug or ploughed in; but if the ground is in sward, and a fresh good soil, hardly any dung will be required; for the sward being dug or ploughed in properly, it generally answers the purpose of dung the first year, and is commonly productive of excellent crops.

The ground may either be dug or ploughed for the reception of the plants. The digging is generally the most practicable for gardens, and being performed one full spade deep will be sufficient; and as to the ploughing, this is commonly practised for large quantities in fields, being careful to plough the full depth; and, if not grass-ground, if ploughed again cross-ways it will be the greater advantage; or in stubborn land, two or three ploughings may be necessary to divide and break the soil properly, performing the first ploughing in autumn or beginning of winter, and cross-ploughed in spring to

wards the time for planting; and if after the ploughing, the surface is rough and stubborn, a good harrowing will be proper for the better reception of the plants.

Then with respect to the method and order of planting the Potatoes, they are planted either with a dibble, or holed in with a spade, or drilled in with an hoe, &c. as hereafter explained, in rows two feet asunder, twelve or fifteen inches distant in each row, and not more than four or five inches deep, as directed below; remarking, however, the American clustered Potatoe in particular should generally be allowed a yard distance between the rows; but some advise all the sorts to be planted at that distance in the field-culture, in order both to admit of horse-hoeing frequently between the rows, to loosen the surface of the earth effectually, and to allow a greater scope for growth, and a more free admission of sun and free air, to give all the chance possible for improving the size of the Potatoes; however, two feet is sufficient.

But as to the particular methods of planting them, the following are occasionally practised, &c. dibble planting, drill planting, holing-in-planting, and bedding-in-planting.

By Dibble-planting.—This being the most general method may be performed either with a common large garden dibble, blunted at the bottom, making holes therewith about four or five inches deep, at the distance before mentioned, dropping one set in each hole as you go on, and striking the earth over them; but those who plant large quantities in fields, have generally a Potatoe-dibble for this purpose, being a large long dibble, about a yard in length, with a cross handle at top for both hands, having the lower end thick, blunt, and shod with iron about six inches up, the iron being also obtuse or blunted at the lower end: and about four or five inches from the bottom is fixed an iron shoulder, cross-ways, three inches length on each side, ranging parallel with the top cross-handle; both for the convenience of a tread for using the feet occasionally to thrust it into the ground, and that by striking it in always to the shoulder, it makes the holes all an equal depth. With this instrument one person is employed in making the holes a foot or more asunder, whilst another follows close after, and immediately drops one Potatoe-set in each hole; then the ground is well raked or harrowed over to cover in all the holes properly. But in gardens, where only moderate quantities are planted for family use, the dibbling-in the sets may be performed with any common garden dibble, thick and blunt at the lower end as hinted above;

above; and one person may both dibble the holes and drop the sets as he goes on, striking the earth in upon them with the dibble, and afterwards rake the ground.—See the articles *DIBBLE* and *PLANTING*.

By *Drill-planting*.—Drills may be formed either with a large hoe or plough, two feet asunder, and four or five inches deep, in which drop the sets, a foot asunder, and cover them in with the earth equally the depth of the drill.

By *Holing-in-planting*.—This is performed with a spade. A man, having a light handy spade, and beginning at one end of the line, takes out a spit of earth, forms a small aperture four or five inches deep, another person directly following after drops a set in the hole, the earth of the next spit immediately covers it up, and so on to the end.

By *Furrow-planting*.—This is sometimes performed in fields, in very light pliable land, and is performed by dropping the sets in the furrow immediately after the plough, and the ploughing of the next furrow turns the earth in upon the sets of the first; and in another furrow two feet from this, drop another row of sets, which are covered in as above; and so on till the whole is finished.

By *Trenching-in*.—This is sometimes practised in gardens, in light ground, by way of experiment, and is effected as they proceed in digging or trenching the ground, being trenched in the common way, each trench two spades wide, and one spade deep, placing one row of Potatoes in each trench. Beginning, therefore, at one end of the ground, open a trench the proper width and depth, as above, then patting in the top of the next trench deeply, together with some good dung in the bottom of the first, levelling it evenly; then digging along about half the width of the next or second trench, turn the earth into the first upon the dung, only two or three inches deep, and upon which lay the Potatoe-sets in a row along the middle a foot or more asunder: then digging along the rest or whole width of the said second trench a moderate spade deep, turning the earth thereof into the first trench, over the sets, three or four inches deep; this done, dung the bottom of the open trench, and proceed with the digging and planting as before; and thus continue trench and trench to the end.

By *Bedding-in*.—This is sometimes done in low wettilsh land, for the sake of raising the beds, and sinking the alleys deep enough to drain off the too copious moisture, and is thus performed. The ground is divided into four, five, or six feet wide beds, with alleys two or three feet wide between bed and bed; and the

beds being digged, the Potatoe sets may then be placed upon the surface in rows lengthwise; and then dig out the alleys a spade deep, casting the earth thereof over the sets about three or four inches thick; or the alleys may be first digged out to raise the beds, and the sets then planted with a dibble in the common method. Thus, by either of these methods, in wet ground, the alleys being sunk, and the beds raised, the alleys drain off the redundant moisture, which might rot the sets before they begin to sprout.

In the above method of planting in beds, it is sometimes performed on grass sward; marking out beds as above, with alleys between, of proportionable width; then, without digging the beds, the Potatoe sets are placed immediately upon the sward, at proper distances; the alleys are then digged, and the spits turned grass-side downward upon the beds, over the sets, covering them the proper depth as above, in which, if any additional depth is wanted, it may be supplied from the under earth of the alleys; and thus the sets being between two swards, they will grow, and often are productive of very good crops, if permitted to have full growth; and when proceeding to take them up, may readily turn off the top sward under which to gather the produce.

But Potatoes are occasionally planted in some other different methods by way of experiment, such as planting them in small clumps of three, four, or five sets together, fifteen or eighteen inches asunder, and five or six feet between the clumps; so that when the plants shoot into stalks a foot or two long, these are layed down along in the ground in different directions, and earthed over three or four inches, repeating the layings once or twice as the stems advance in length, earthing them over as above; they striking root in the ground, produce Potatoes accordingly their whole length as far as they are layed in the earth.

But in all the above methods of planting Potatoes, those of dibbling-in, drilling, and holing-in, &c. in continued rows, are the most in practice; and more generally, the ground being properly prepared by digging or ploughing, the dibbling them in being the most ready and expeditious, is the most commonly practised.

Culture of the Plants.

The Potatoes being however planted in either of the above methods, it now remains to speak of their future management; observing, therefore, they are to remain in the same place to grow to perfection; and as to culture, when the plants come up, and weeds begin

begin to over-run the ground, they require only two or three hoeings to kill the weeds, and loosen the surface of the soil; the Potatoes generally coming up in about a month or five or six weeks after planting, being generally accompanied by numerous weeds, which should be hoed down in due time, before they grow large and overspread the surface, or over-top the plants; performing the hoeings generally in dry weather by broad-hoeing, or in fields by horse-hoeing, for the greater expedition; repeating the hoeings according as the future growth of weeds shall render it necessary, as well as to stir and loosen the surface of the ground about and between the plants, which will also prove very beneficial culture in improving their general growth. After, however, two good hoeings, the plants will generally be advanced sufficiently out of the reach of weeds, and become so spreading as to prevent their future progress, when no farther care will be required till the Potatoes are arrived to perfection. In hoeing Potatoes, many take the pains to hoe up a ridge of earth close to each side of every row of plants in the first or second hoeing, to strengthen their growth more effectually, and render them more prolific, as the bottom of the stalks, so landed up, generally emitting roots in the earth that become productive of Potatoes the same as the principal roots.—Thus far is the principal culture of Potatoes, they hardly ever requiring any farther care after June and July; but the crops, however, continue growing till autumn, and the main crops in particular, which you design shall stand to have their full growth, will continue growing till October, or till the haulm begins to decay in November, when the Potatoes being full grown, they should be then wholly taken up before they are attacked by frost, and deposited in some dry apartment for keeping; remarking, however, as we before observed, that new Potatoes being by many required as forward in the season as possible; and sometimes the early sorts, growing in warm rich land, afford young Potatoes in June and July, as big as walnuts, or little apples, in which case may begin to dig up some for present use; though only a few should be taken up at a time at this early season, just by way of rarity, not more than can be used in a day or two; for, being not a quarter grown, they will not keep long out of the ground; if even but a few days, they will neither boil, bake, or eat well; but as before intimated, they in the more advanced part of July and in August, will have attained some considerable growth, to take up in large quantities; so may continue

thus taking up a few at a time occasionally, so as to have a constant supply from June or July, till the perfection of the general crops in September, October, and November.

Method of digging them up, and housing them for Winter and Spring Use.

As to the method of digging up the Potatoes for use, it is most commonly performed in gardens with a three-tined fork; and sometimes in fields they are ploughed up for the sake of making quicker dispatch for considerable quantities; but the forking them up, however, makes the cleanest work; and there are Potatoe-forks for the purpose, being made with flat tines, blunted at the point, and fixed upon a spade-handle. Most country smiths know how to make them; and are sold at the iron-mongers, and at many of the nurseries.

Previous to the digging up the Potatoes, the haulm should be cleared away for some considerable space close to the ground, turning it off in heaps, to clear the surface, for the greater convenience and expedition in digging, &c. then, if intended to fork them up, proceed by first opening a trench along one end of the ground one spade wide and deep, and then go on with the digging up the Potatoes the same depth, having large baskets, &c. placed, in which to throw them as they are dug up, being careful to dig all the ground regularly along spit and spit, the bottom part of the haulm remaining to each root will be some direction for placing the fork, turning the spits clean up before you into the open trench, and pick the Potatoes of each plant clean out, great and small, as you go on, and put them in the baskets. As you advance with the digging, continue clearing off the haulm upon the dug ground in heaps, which may afterwards be burned to serve as manure, and thus proceed till the whole is dug up, taking the opportunity, whilst dry, to house those directly that are intended for long keeping.

The taking up Potatoes by the plough is performed by ploughing the ground in the common method, which turns up the Potatoes very expeditiously to the top, several hands following immediately after to pick them clean out.

Immediately after the Potatoes are taken up, pick out all the cut and bruised ones; likewise may sort out the small chats from the large ware, and then let the main crops for keeping be housed, when they are perfectly dry, in some dry close place, well defended from the free air, wet, and frost, in which the Potatoes may be deposited in a large heap, if brought.

brought in quite dry; previously clearing them from all adhering earth and fibres, &c. for the drier and cleaner they are housed, it will prove advantageous in keeping them in greater perfection, covering the whole, however, at last, with a good thickness of dry straw, and keep the apartment close shut; for the more the external air is excluded the better they will keep.

Thus the main crops of Potatoes being taken up and housed, they will remain sound all winter and spring, till the arrival of new ones next summer, as we before remarked, provided they are well defended, as above, from wet and frost.

It is, however, to be remarked, that at the approach of spring, January, February, March, and April, many of the Potatoes will vegetate and sprout forth in the house, so should be turned over occasionally, and still continue a thick covering of straw, to exclude the external air as much as possible, and they will keep till June.

Raising them from Seed.

By Seed.—This is very rarely practised, because their great increase by roots render it unnecessary; besides, the propagation by roots is considerably the most expeditious and effectual method: so that raising Potatoes from seed is only sometimes practised by way of experiment, and to try to gain new varieties. However, when this is intended, let some of the first flowering-plants be marked for seed, which gather in autumn when full ripe, and in March or April following sow it in some light soil, in an open situation, in shallow drills, a foot asunder; and when the plants come up, keep them clear from weeds till autumn, when, about the end of October or beginning of November, take up the roots, select the finest and largest, which preserve in sand till spring, then plant them in the common way, and by autumn following they will have made proper increase, and attain full perfection; and you will then judge of their properties.

SOLDANELLA, Soldanel. A low herbaceous perennial plant, garnished with kidney-shaped leaves, and bell-shaped flowers.

Class and order, *Pentandria Monogynia*.

Characters.] CALYX, five-parted, lanceolate, and persistent. COROLLA, monopetalous and campanulated, with the border cut into many acute segments. STAMINA, five subulate filaments, topped with arrow-shaped antheræ. PISTILLUM, a roundish germen, style slender, crowned with a simple stigma. PERICARPUM, an oblong taper capsule, of one cell, containing a number of small, pointed seeds.

There is but one species,

SOLDANELLA alpina.

Alpine Soldanel.] Hath a fibrous perennial root, with leaves almost kidney-shaped, about an inch wide, standing on long foot-stalks; between these arise naked flower-stalks about four inches high, each supporting two purple bell-shaped flowers, with their border divided into many small segments, which are succeeded by capsules, containing the seeds.

Varieties.] With blue flowers—with white flowers—with flowers very much fringed.

These plants make a pretty appearance in March, they require a moist soil and shady situation, but should have some protection in winter, and are propagated by parting the roots early in autumn.

SOLIDAGO, Golden-Rod. (*Virga aurea.*)

It comprises many herbaceous flowery perennials, of upright growth, for adorning the pleasure ground; rising with numerous erect stalks, from one to several feet high, garnished mostly with narrow, spear-shaped, and oval leaves, and the top terminated by numerous spikes of small, compound, radiated, golden-yellow flowers.

Class and order, *Syngenesia Polygamia Superflua*.

Characters.] CALYX, a compound radiated flower, having an oblong imbricated cup, composed of several narrow connivent scales. COROLLA is compound and radiated, having numerous funnel-shaped, quinque-dentate, hermaphrodite florets in the disk, and tongue-shaped, tridentate, female florets in the radius. STAMINA, five short hair-like filaments, with cylindric antheræ. PISTILLUM, an oblong germen, filiform style, crowned with a bifid stigma, and in the females two revolute stigmas. PERICARPUM, none. SEMEN, a single oblong seed in each floret.

The species of Golden-Rod are very numerous, but not more than ten or twelve are of estimation for our purpose, one of which is a native of England and most parts of Europe, and most of the others are from North America; but all the sorts are very hardy, and retained in our gardens as flowering plants.

They are all fibrous-rooted perennials, that renew their stalks annually in spring.

The species most common are,

1. **SOLIDAGO Virga aurea.**

(*Virga aurea*)—or *Common Golden Rod.*]

Rises with several angular, slender, almost flexuose stems, from one to two feet high, garnished with narrow spear-shaped leaves, and

and divide upward into paniculated, erect, clustered spikes of golden-yellow flowers, in August and September.

Varieties.] Tallest Purple-stalked.—Broad sawed-leaved, — Narrow slightly-sawed-leaved, — Low-stalked, &c. — Each of which was formerly ranged as a distinct species, but prove to be varieties only of the common *Virga aurea*.

This species and varieties grow naturally in many parts of England, &c.

2. *SOLIDAGO canadensis*.

Canada Rough-leaved Golden Rod.] Rises with several round smooth stems, two feet high; narrow, rough, trinervous, slightly-serrated leaves, and terminated by corymbose panicles, with recurved spikes of ascending yellow flowers, appearing in July and August.

3. *SOLIDAGO altissima*.

Tallest, Late-blowing, American Golden Rod.] Rises with numerous round smooth stems, four or five feet high; spear-shaped, sawed, enervous, or unveined leaves, and terminated at top by large corymbose panicles, with recurved spikes of ascending yellow flowers, in September and October.

Varieties.] There are many varieties of this species, differing somewhat from one another, but distinguishing themselves specifically, as this sort, by their tallish growth, enervous or unveined leaves, and large corymbose - paniculated recurved clusters of flowers, as above, flowering late in autumn.

4. *SOLIDAGO latifolia*.

Broad-leaved Canada Golden Rod.] Rises with erect angular stalks, two or three feet high; broad, oval, sharp-pointed, sawed leaves, and lateral single spikes of yellow flowers, appearing in September.

5. *SOLIDAGO flexicaulis*.

Flexible Canada Golden Rod, with a Fig-wort Leaf.] Rises with slender flexuose stalks, two feet high; oval, sharp-pointed, serrated leaves, lateral single spikes of pale-yellow flowers, in September.

6. *SOLIDAGO mexicana*.

Mexican Golden Rod.] Rises with oblique brown stalks, a foot and half high; spear-shaped entire leaves, and erect, branching, leafy peduncles, bearing yellow flowers in August and September.

7. *SOLIDAGO caesia*.

Grey Smooth-stalked Maryland Golden Rod.] Rises with naked smooth stems, a foot and half high; garnished with narrow, spear-shaped, acute-pointed leaves, and terminated by corymbose panicles of yellow flowers, the spikes thickening above, appearing in September.

8. *SOLIDAGO lateriflora*.

Lateral-flowering American Golden Rod.] Rises with small stalks a foot and half high; narrow, unferrated, pointed leaves, and the stalks branching laterally below, almost from bottom to top, in floriferous spikes, shortening, and terminating upwards in corymbose panicles, with recurved spikes of yellow flowers, in September.

9. *SOLIDAGO rigida*.

Stiff-leaved, Pennsylvania Golden Rod.] Rises with many upright stalks, two feet high, branching alternately; oval, stiff, rough, cauline leaves, and the stalks and branches terminated by a corymbus of yellow flowers, in September.

10. *SOLIDAGO novaboracensis*.

New York Golden Rod.] Hath oval, oblong, radical leaves, having foot - stalks, branching naked stalks, near two feet high, garnished with very small leaves, and terminated by panicles of bright-yellow flowers, in September.

11. *SOLIDAGO minuta*.

Least Pyrenean Golden Rod.] Rises with small single stalks, only about a foot high, spear-shaped entire leaves, and the pedunculi rising at the axillas, each supporting but one yellow flower, appearing in August.

12. *SOLIDAGO sempervirens*.

Ever-green, Fleshy-leaved, New York, Golden Rod.] Rises with several upright reddish stalks, five or six feet high; spear-shaped, almost fleshy, smooth leaves, with roughish margins, and the stalks terminated by large corymbose panicles of bright-yellow flowers, appearing in October, and great part of the winter, in mild seasons.

All these twelve species of *Solidago* are very hardy fibrous-rooted perennials, of great duration in root, but mostly annual in stalk, which rising in spring, many from each root, arrive to a flowering state in summer and autumn; all the stalks adorned upward with long spikes of numerous small flowers, exhibiting a very conspicuous bloom a month or six weeks, or two or three months in different species; and totally decay to the root in winter.

They are so hardy as to prosper in any common soil and situation, with but very little trouble in their culture.

Considered, therefore, as garden furniture, they are proper autumnal ornaments for almost every compartment of the pleasure ground, and should be introduced in assemblage in all large borders, shrubberies, wilderness quarters, and the borders of wood-walks, &c. where, being judiciously distributed

buted at eligible distances, they will effect a grand autumnal bloom for three or four months, in the different sorts, as each root generally sends up numerous stems close together, often forming a large bush, adorned above with numerous long panicles of golden-yellow flowers, which, though separately small, they being numerous and closely placed in each spike, are remarkably conspicuous and ornamental, particularly all the foreign kinds.

The flowers in all the sorts are compound and radiated, composed each of numerous hermaphrodite and female florets, as expressed in the *Characters*.

Most of these plants increase exceedingly by the roots, a small slip of which often multiplies, in one season, into a large bunch; and several of the sorts being apt to spread considerably, require to be slipped, or cut in all round every year or two, to keep them within proper bounds.

They should, therefore, be always planted at some considerable distance from one another, and not too near small plants.

Method of Propagation and Culture.

The propagation of all the sorts is effected with great facility, by slipping or parting the roots in autumn and winter, soon after their stalks decay, or early in spring, before they begin to shoot; not slip them too small; and may be planted at once where they are designed to flower, and will all blow in good perfection the following summer and autumn.

All the culture they require is to have the decayed stems cut down every winter; and when the roots have increased considerably spreading, should be slipped or cut in all around, as before observed.

SOPHORA, (Sophora.)

In this genus are comprehended several species of herbaceous flowering perennials for the pleasure ground, and tender shrubby exotics for the hot-house; growing two or three, to four, five, or six feet high, in different species; adorned with compound pinnated, and some with simple leaves, and papilionaceous, quinquepetalous, blue, yellow, and other coloured flowers produced in lateral and terminal spikes.

Class and order, *Decandria Monogynia*.

Characters.] CALYX is monophyllous, short, bell-shaped, divided at top into five oblique, blunt segments. COROLLA is papilionaceous, of five dissimilar petals, consisting of an oblong vexillum, broader at top, reflexed at the sides; two oblong wings appendiculated at the base, and the carina form-

ed of two petals, like two wings joining at their lower edges. STAMINA, ten distinct awl-shaped filaments, inclosed in the carina, topped with very small assurgent antheræ. PISTILLUM, an oblong cylindric germen, one subulate style, situated as the stamina. PERICARPIUM, the germen becomes a very long, slender pod, filled with many roundish seeds.

The species of principal note are the following; consisting first of three herbaceous perennials for the pleasure garden, and several shrubby and other kinds for the stove hot-house.

Hardy Herbaceous Kinds.

Comprises three species of perennial exotics, of moderately hardy growth, to introduce in the borders, &c. as decorative flowering plants.

1. *SOPHORA alopecuroides.*

Fox-tail-like, Oriental Sophora.] Hath a creeping perennial root, sending up erect, firm stems, three or four feet high; pinnated leaves of many pair of small oblong folioles, terminated by an odd one; and the stalks producing lateral and terminal spikes of blue flowers, in July or August.

2. *SOPHORA tinctoria.*

Tinctorious Yellow Virginia Sophora.] Hath a perennial root, sending up many weak procumbent stalks, leaves composed of three roundish lobes, united at the base, and supported on very short foot-stalks, and lateral and terminal short spikes of yellow flowers, in July; succeeded by ripe seeds in autumn.

3. *SOPHORA tetraptera.*

Four-winged-podded Sophora.] Hath a creeping perennial root, upright tree-like stalks, pinnated leaves, formed of several oblong, pointed, opposite folioles, terminated by an odd one, and spikes of large, rich-yellow flowers, in May or June; succeeded by long, membranous, quadrangular, winged pods.

The above three species are proper to introduce in pleasure grounds, as ornamental flowering plants; allotting them some dry warm compartments: and some plants of the third sort in particular should be trained against a warm wall, where they will flower in the fullest perfection, and being rather tenderish, may be covered in severe weather, to preserve them more effectually.

All the three sorts may be planted in autumn or spring; and they will flower very conspicuously in summer, in their respective seasons, May, June, July, August, in the different species.

They are propagated by parting the roots in autumn or spring, and also by seeds in the latter-mentioned season.

Tender

Tender Kinds for the Stove.

These consist principally of elegant shrubby exotics, from Asia, Africa, and America, all of the most tender temperature, requiring the protection of a hot-house in this country; growing four, five, or six feet high, garnished with pinnated and simple leaves, and lateral and terminal spikes of flowers very ornamentally in summer and autumn.

4. *SOPHORA tomentosa.*

Tomentous Silvery Sophora of Ceylon.] Rises with an upright, branchy, downy stem, five or six feet high; garnished with pinnated woolly-silvery leaves, composed of five or six pair of roundish folioles; and spikes of yellow flowers, succeeded by cylindric, woolly seed-pods.

5. *SOPHORA biflora.*

Two-flowered African Sophora.] Groweth with upright stalks, ob-oval, somewhat downy simple leaves; and peduncles having two flowers.

6. *SOPHORA heptaphylla.*

Seven-leaved Indian Sophora.] Having pinnated leaves, composed of seven smooth folioles.

7. *SOPHORA microphylla.*

Small-leaved Otaheitean Sophora.] A plant of elegant growth, adorned with pinnated or winged leaves, composed of numerous very minute, roundish, smooth pinnæ, about a quarter of an inch long, of a dark-green colour.

The following are less noted kinds,

8. *SOPHORA angulata.* — Angular-leaved Sophora.

9. *SOPHORA alba.* — White-flowered Sophora.

10. *SOPHORA lupinoides.* — Lupine-like Sophora.

11. *SOPHORA capensis.* — Cape Sophora.

Most of the above tender *Sophoras* are very elegant plants, all originally from distant hot countries, and cannot be cultivated in these parts, without having a constant residence in our hot-houses or stoves, in which, being potted in good mellow light earth, they will grow very agreeably, and form an elegant variety at all seasons.

They are propagated by seeds sown in the spring, in pots plunged in a hot-bed, under glasses, or in the bark-bed; and when the seedling plants are a little advanced in growth, transplant them into separate pots, watered and placed in the bark-bed till fresh rooted, and continued always in the stove; and have the culture in common with other exotics of that department: may also try the propagation by

layers and cuttings, by similar assistance as above.

SORBUS. Sorb, or Service-tree

This genus is composed of noted deciduous trees, of middling stature, principally for ornamental plantations; growing from twenty to thirty or forty feet high, or more, adorned with beautiful pinnated leaves of many pair of folioles, and pentapetalous flowers in umbellate clusters towards the ends of the branches, succeeded by large bunches of red berries.

Class and order, *Icosandria Trigynia.*

Characters.] *CALYX* is monophyllous, concave-spreading, quinque-dentate, and permanent. *COROLLA*, five roundish concave petals, inserted into the calyx. *STAMINA*, about twenty awl-shaped filaments, having roundish antheræ. *PISTILLUM*, a germen under the receptacle, three slender styles, and capitated stigmas. *PERICARPIUM*, a roundish, soft, umbilicated berry, containing three oblong cartilaginous seeds.

There are only three species in this genus; all hardy deciduous trees; one of which is a native of England, &c. the others are exotics from the continent of Europe and other foreign parts; the two first sorts in particular are common in most of the nurseries and eminent plantations.

1. *SORBUS domestica.*

Domestic or cultivated Service-Tree, with large eatable fruit.] Grows with an upright stem, branching thirty or forty feet high, or more, having a brownish bark, and the young shoots in summer covered with a mealy down; pinnated leaves of eight or ten pair of broadish deeply serrated lobes and an odd one, downy underneath, and large umbellate clusters of white flowers at the sides and ends of the branches, succeeded by bunches of large, fleshy, edible, red fruit, of various shapes and sizes in the varieties.

Varieties of the fruit are,] With Apple-shaped fruit—Pear-shaped fruit—Oval-fruited—With turbinate fruit—Compressed-fruited, &c.—all of which ripen in autumn; generally two, three, or four in a bunch, being sometimes as big as little apples and pears, but are rarely palatable till they begin to assume a state of decay, as it were, becoming soft and tender.

This tree is a native of the southern warm parts of Europe, where its fruit is in high esteem to serve up in desserts, and is cultivated here, in many of our gardens, both as a fruit-tree, and to diversify hardy plantations.

2. *SORBUS aucuparia.*

6 S 2

Birds'

(*Birds' Service*)—or *Mountain Sorbus*, commonly called *Mountain Ash*; also *Quicken Tree*, *Quick Beam*, or *Roan Tree*.] Rises with a straight upright stem, and regular branching head, twenty or thirty feet high, or more, covered with a smooth greyish-brown bark; pinnated leaves of eight or ten pair of long, narrow, serrated folioles, and an odd one, smooth on both sides; and large umbellate clusters of white flowers at the sides and ends of the branches, succeeded by clusters of small red berries, ripe in autumn and winter, of a harsh sour taste, unpalatable to eat.

Variety.] Yellow-striped-leaved.

This species grows wild in many parts of this island, on mountainous places, woods, and hedge-rows, often arriving to the growth of timber, and is admitted in most ornamental plantations, for the beauty of its growth, foliage, flowers, and fruit; the latter, in particular, being produced in numerous large red bunches all over the tree, exhibit a fine appearance in autumn and winter, till devoured by the birds, especially the blackbird and thrush, which are so allured by these fruit, as to flock from all parts and feed on them voraciously, but are not fit for domestic or household use.

3. *SORBUS hybrida*.

Mongrel, or Bastard Service Tree.] Grows twenty or thirty feet high; half-pinnated leaves, very downy underneath, and clusters of white flowers, succeeded by bunches of roundish red berries in autumn.

These three trees are all of the deciduous tribe, and of hardy temperature, growing freely in any of our open plantations in any common soil and situation; their foliage and flowering is generally pretty forward, commonly expanding their leaves in April, or early in May, being all of the beautiful, pinnated, many-lobed kind; and the flowers appear in May and June, composed each of five small petals, but many growing together in clusters, are conspicuous enough; succeeded by baccaceous fruit, ripening in August, September, and October, often remaining on the trees after the fall of the leaf, particularly the *Sorbus aucuparia*, which often retains its fruit all winter, or till devoured by the birds, as before remarked.

As to the merit of these trees in gardening, they are all very applicable for diversifying the shrubbery and other hardy plantations; being introduced as standards, they will effect a fine variety in assemblage, with their elegant pinnated leaves and clusters of flowers and fruit: the *Mountain Sorbus*, particularly, should be

plenteously interspersed in all extensive shrubberies, for the singularity of their numerous clusters of berries in autumn and winter, which also prove food to encourage plenty of singing birds in the plantations.

But the *Sorbus aucuparia* may also be introduced as a forest tree in timber plantations; being mostly all heart, is valued for many purposes.

And some of the *Sorbus domestica* may also be employed as fruit-trees in the garden and orchard; some being trained as standards, others as dwarfs, and against walls and in espaliers for variety, training them nearly as directed for pears and apples.

They are raised in all the public nurseries for sale, particularly the first two sorts.

Method of Propagation, &c.

They are all easily propagated in abundance, by seed, in the open ground, also by layers, though the seedlings generally make the handsomest plants.

By Seed.—The berries, or fruit containing the seeds, ripen abundantly in autumn, which is the proper time for sowing them, being careful to have them perfectly ripened, gathering them in due time before devoured by the birds, and prepare to sow them as soon after they are gathered as possible. For their reception, dig a spot of lightish ground in the nursery, and divide it into four-feet-wide beds, in which sow the seeds, either in drills an inch deep, or bed them in, by raking the earth from off the bed near that depth; then sowing the seed all over the surface, cover them all an equal depth, with the earth drawn off, as above, for that purpose: some of them will probably rise the following spring: they, however, frequently remain till the second spring before they come up; observing, in either case, that, in spring following, when the seedlings are a year old, they should be planted out in nursery rows, to remain till they acquire a proper size for final transplantation.

Sometimes, in order to forward the germination of these seeds, particularly the *Sorbus domestica*, we sow them in large pots, which being sheltered under a frame in winter, and in spring plunged in a hot-bed, will bring up the plants the same year fit for transplantation in nursery rows the following autumn or spring.

By Layers.—Having some of the trees, while young, cut down near the ground, it will force out lower shoots, which being layed, in the common way, in autumn and spring, they will readily emit roots, and be

fit

fit for transplantation in nursery rows in one year. This is also a certain method to continue any particular variety.

But the cultivated Service in particular, when designed to raise a quantity as fruit-trees for their fruit, they should generally be propagated by grafting or budding the choicer-fruited kinds upon stocks of any of the sorts of *Sorbus*, raised from seeds or layers as above; they will also take upon pear-stocks.

Generally in rearing these three species of *Sorbus* by any of the above methods of propagation, should train them principally for standards, each with a single upright stem; and being thus trained in the nursery till three, four or five, to six or eight feet high, are then proper for any plantation intended, and may be transplanted as required, at the usual planting season of autumn or spring.

When the said trees are of eligible growth, as above, for final transplanting, they may be introduced in any large shrubbery compartments, and other ornamental plantations, and in those of forest trees; allotting also some of the domestic services as fruit-trees in gardens and orchards, as before observed, principally as standards, or some occasionally in espaliers, &c. and, in both of which, planted and managed similarly as advised for apple and pear-trees; permitting the standards to shoot freely above into full heads; the others regulate according to their order of training; and in due time they will produce plentiful crops of fruit annually to gather in autumn; observing generally, in gathering this fruit for the table, it is proper to lay some in the fruitery, &c. a little time to mellow, soft and tender; in which state it becomes eatable, of an agreeable taste and flavour; and in the final gathering of the whole in October, &c. the bunches of fruit being deposited in a similar manner, they will mellow gradually for eating in November and December.

SOUP HERBS.

Many sorts of herbaceous vegetables, of the culinary tribe, are in great estimation for the improvement of soups, &c. a list of which, collected under this head, will serve to assist the memory in furnishing the garden with the proper sorts; remarking, that under the denomination of Soup Herbs, may also be understood all the sorts of Pot-herbs used occasionally in soups and broths, &c. and in which are also included several sorts used likewise as salad herbs.

In some families a great variety of Soup or Pot-herbs are occasionally required, and in others a few only of the common sorts are used, so that every kitchen-garden ought to be furnished accordingly with the proper sorts.

The following is, therefore, a list of the principal sorts occasionally used as soup-herbs, &c. several of which, however, are also employed in various other culinary uses, salads, &c. as well as for soups. Celery—Endive—Leeks—Lettuce—Spinach—Green and White Beet—Chard Beet—Orach—Borage—Bugloss—Burnet—Chervil—Sorrel—Parsley—Coriander—Pot-Marigold—Thyme—Winter Savory—Summer Savory—Pot or Winter Marjoram—Sweet Marjoram—Spear-Mint—Tarragon—Basil—Love-Apple, or Tomatoes.

In all of which, except the Marigold and Love-Apple, the leaves are the only useful parts; but in the Marigold the flowers are the only part used, and in Love-Apple the fruit; remarking, likewise, that all the sorts, but the last two of the list, (Basil and Love-Apple) are of a hardy temperature, and may be easily raised in the natural ground; and the greater part are biennials and annuals, that require to be annually raised from seed; but the Thyme, Winter Savory, Pot or Winter Marjoram, Sorrel, Mint, Burnet, and Tarragon, are perennials of many years' duration, being raised some both by seeds and slips, others principally by slips; and the Basil and Love-Apple, being tender annuals, require to be raised from seed in a hot-bed. See the culture of all the sorts under their respective genera.

But the most prevailing Soup or Pot-herbs, of the above list, for general use, are, Celery, Endive, Leeks, Spinach, Beet, Parsley, Chervil, Thyme, Marjoram, Savory, and Spear-Mint.

However, the particular merit of the different sorts, together with the proper culture, is fully exhibited, each under its proper head.

SOWING OF SEEDS.

Different methods of sowing Seeds are practised occasionally, as different sorts require, and according to different practitioners; such as broad-cast sowing and raking-in, —drill-sowing,—bedding-in-sowing, &c.

BROAD-CAST SOWING, &c.—This is the most common and expeditious method of sowing in practice, particularly in the kitchen-garden, both for many of the principal crops to remain, and for transplantation; and is performed by sowing the Seed with a spreading cast evenly all over the surface of the ground, either in one continued plat, or divided into beds, which is immediately raked with a large rake to bury all the seeds a due depth in the earth, some requiring to be raked in as light as possible, others half an inch or an inch or more deep, according to their size, &c.

In preparing for this method of sowing, the ground is previously dug in the common way, making the surface level with the spade

as you go on; no occasion, however, to break the surface very fine, nor rake it, only breaking all lumpy clods, and forming it even with the spade, as just observed, and leave it a little roughish, more or less, in proportion to the size of the Seeds, that, in raking them in, they may be more effectually buried a proper depth for germination; observing, for the general part, that the ground should be sown whilst fresh stirred, before the surface is rendered either too dry and hard by the sun and wind, or made wet by rain, but when it is so moderately dry as not to clog to the feet or rake, and that it will readily fall under the rake in raking in the Seed.

All broad-cast Sowing should generally be performed in dry weather, more particularly all early sowing in winter and spring; but in hot weather, in summer and autumn, it may often be eligible to take advantage of sowing immediately after a shower or moderate rain.

After, however, having digged the ground as above, the Seeds are then to be sown broad cast, all over the surface, either in one continued plat, and raked in as before remarked; or the ground may be previously stepped out into four or five feet wide beds, with small alleys between bed and bed, then sowing the seed on each bed separately, or, on particular occasions, may first sow the ground broad-cast, as above, and afterwards mark the ground out in beds, as aforesaid, paring up the earth of the alleys an inch or two deep, spread it over the beds, and rake them evenly lengthways. The laying out the ground in beds may, in some cases, be the most eligible way; such for example, if wet ground that cannot bear treading, we can stand in the alleys both to sow the Seed and rake it in, without trampling the beds; and when weeding and watering becomes necessary, can also stand in the alleys to perform those works; likewise to cull and gather the produce, or transplant where necessary; however, in kitchen-gardens, where ground is scarce, or that it is of importance to make the most of every part of the ground, as well as use the most expeditious method of sowing possible, the broad-cast sowing all over the surface, in one continued plat, as above observed, may be the more eligible practice, especially in large grounds, for the main crops of carrots, parsneps, turneps, onions, leeks, spinach, lettuce, radishes, &c.

As to the method of sowing the Seed in the Broad-cast way, it is effected occasionally both with an open and locked hand.

In the former case (sowing open-handed) it is performed by delivering the Seeds with an open hand, and broad-spreading cast, as

practised in sowing corn in the open fields, previously stepping out the ground in breaks, or certain widths, as a guide to sow with the greater regularity; so proceeding with the sowing along each space with a regular step and cast, giving the hand a proper sweeping cant forward, fully expanded at the delivery of the Seeds, making them spread abroad evenly in every part; and thus proceed up one space and down another till finished; which method of Broad-cast sowing is practised in large kitchen grounds in sowing any considerable space in one continued plat, as observed above.

But in the other case, (sowing close-handed) it is practised occasionally, both in sowing large continued plats of ground, and narrow beds, &c. but more generally the latter; especially when we intend sowing them bed and bed separately, or narrow borders, and other small plats of ground, we commonly sow or deliver the Seeds with a locked or close hand, discharging them from between the fore-finger and thumb, opening or pinching the thumb more or less, according to the size and nature of the Seeds, and thickness they require to be sown, giving the hand a sort of jerking turn, or cant forward at the delivery, to cause the Seeds to spread regularly.

As soon as the seeds are sown in either of the above methods of sowing, let them be directly raked in before the surface of the ground is rendered either too dry by the sun and wind, or made wet by rain, if likely to happen; observe as below.

But previous to the raking in the Seeds sown broad-cast on the general surface in one continued space, as above, that if the ground is loose, light, and dry, and a dry season, it is advisable immediately, after sowing, to tread them in evenly by treading the ground all over light and regularly with the feet; it being more particularly necessary in light loose ground in the above Broad-cast Sowing, which not only settles the Seeds, so as to be more effectually buried all an eligible regular depth in the raking, but also settles the ground evenly in every part, as that when we stand thereon to rake in the Seeds, the feet will not sink in holes, as would be the case at every step in light ground, if not previously trodden; it also prevents the drought of the spring from penetrating too freely: but, indeed, if the ground is laid out in beds, we may either tread in the Seeds or not, as we may readily stand in the alleys to rake them in without trampling the beds; which, in wetish ground in particular, may be the more eligible practice; however, even in the sowing in beds immediately on the surface, as above, in ve-

ry light loose soils, with a dry surface and dry season, it is eligible enough to tread in the Seed, previous to raking the ground after sowing; and it may also sometimes be proper to pare up the loose earth of the alleys an inch or two deep, and spread it thinly over the surface; observing in general, that the work of treading in the Seeds, in both the above methods of sowing, is performed with the feet nearly close together, taking short regular steps, treading the surface lightly all over, once in a place, with but small spaces between the steppings.

Directly after Sowing the Seeds, as above, let the ground be regularly raked over to cover all the seeds effectually a proper depth, using a large or good middling rake for this purpose (see **RAKE**); being careful to rake very regularly, not to draw the earth and Seed in heaps, raking only once or twice in a place; which is generally sufficient, especially where the Seed has been previously trodden down in the above manner; taking care, however, to perform it so effectually as to bury all the Seeds properly: and as you advance in the raking, trim off lightly all large stones, hard lumpy clods, and rubbish.

Observing, some Seeds require to be raked in as lightly as possible, such as all the very small Seeds; others require to be a quarter or half an inch deep, others a whole inch or more; so use smaller or larger rakes accordingly. See **RAKE**.

The above methods of Broad-cast Sowing and raking in, both in large spaces, and in beds, borders, &c. may be practised to numerous sorts of Seeds, particularly the greater part of the esculents of the kitchen-garden, numerous flower seeds and others, as is generally hinted in their culture; and, being the most ready and expeditious mode of Sowing, is proper for general practice, especially in extensive grounds, except for some particular sorts of Seeds that require to be sown either in drills or by bedding in, as directed below; which is particularised in treating of the respective plants in their proper places.

But in many of the extensive market kitchen-gardens, where they sow large tracts of ground at once, instead of raking in the Seed sown in the Broad-cast way immediately on the surface, they, for the sake of expedition and cheapness, have light short-tined harrows to draw with men, with which they harrow in the Seeds; and sometimes in light dry ground, and a dry surface, they afterwards roll the ground with a light wooden roller, to close and smooth the surface over the Seeds

more effectually, performing it when the surface is a little dried so as not to adhere to the roller.

And in the large garden-farms in fields, where they commonly plough and harrow the ground for the reception of Seeds, they practise only the Broad-cast Sowing in continued tracts for almost all their esculent seeds, except for peas, beans, and kidney-beans; the ground being prepared by ploughing, and afterwards rough-harrowed, to smooth the surface moderately, the seeds are then sown broad-cast, in the spreading open-handed manner, and then harrowed in either with a light short-toothed horse-harrow, or harrowed in with men for particular crops; then, if very dry weather, roll the surface afterwards with a wooden roller, drawn also by horses, &c. to smooth the surface, as aforesaid.

DRILL SOWING.—This method of Sowing is necessary for many sorts of seeds, both esculents, flowers, and tree and shrub kinds in the nursery, both for the plants to remain where sown, and for transplantation, and is performed by drawing drills with an hoe, from a quarter or half an inch, to two or three inches deep, according to the sizes and sorts of seeds, which being sown evenly along the bottom of the drill, the earth is drawn evenly over them with a hoe or rake, the depths as above, and the surface lightly raked smooth.

As to the sorts of seeds that may be sown in drills, numerous sorts may with propriety be sown in that method, but is particularly eligible for many large kinds, such as peas, beans, kidney-beans, and many large kinds of tree and shrub seeds, nuts, and berries; it being not only the most ready method of committing those large seeds to the ground the proper depth; but being sown in rows at a distance, best suits the nature of growth of many sorts of plants, and their method of culture. Many kinds of small seeds are the most conveniently sown and cultivated in drills, such as several of the kitchen garden plants, as parsley, chervil, coriander, all the sorts of small-sallading, and sometimes spinach, beet, &c. also some of the aromatics when designed as edgings, or also occasionally in rows in beds, both to remain and for transplanting,—such as thyme, savory, hyssop, and the like, which is generally mentioned in treating of their culture; likewise many sorts of flower-seeds are the most commodiously sown in drills, both when designed for transplantation, and sometimes to remain, as is exhibited under their proper genera: but many of the tree and shrub seeds, in particular, are the most conveniently sown in drills: all of which.

which is properly noticed under the genera of the respective sorts.

For by Sowing in Drills, to all such plants as admit of it, proves not only an eligible method of sowing to bury all the seeds regularly an equal depth; but the drills being at some distance from one another, admits the sun, air, and rains more effectually to the plants, and gives them a greater scope of growth, than such as are sown broad-cast, or promiscuously all over the surface, but admits also of introducing a hoe between the drills to hoe down weeds and loosen the soil; which always proves a most beneficial culture.

The method of drill-sowing is both easy and expeditious: in gardens it is performed by drawing the drills with a common drawing-hoe, large or small, in proportion to the sorts of seeds to be sown, generally setting a line as a guide to draw the drills straight, which, as before observed, are drawn of different depths, from a quarter or half an inch to two or three deep, as the sorts and sizes of seed may require, and at proportionable distances, from three or four inches to so many feet, according to the nature of the plants; all of which particulars are always noted in the culture of the respective sorts, ranged under their proper heads.

The general method of drawing of drills for the reception of seeds is with a common drawing-hoe, as before noticed, sometimes with a large hoe, and sometimes a middling or small hoe, according to the size of the drill required, size and nature of the seeds; drawing the drill most generally with the corner of the hoe, especially for larger seeds, and sometimes with the edge of the hoe flat-ways or horizontally; but for large seeds, such as peas, kidney-beans, many of the nut kinds, and many other large seeds both of trees, shrubs, and herbaceous plants, require a deep angular drill, drawn with the corner of the hoe, turning the edge close to the line, so draw the drill along with an angular bottom evenly the depth required, the earth remaining close along the side of the drill, ready for turning in again over the seeds; but where flat or shallow drills are required for smaller seeds, it may, in many cases of some particular sorts, be more eligible to draw the drill with the hoe flat-ways, holding the edge in a horizontal position, as before observed, drawing the drill along with a flat bottom evenly the whole width of the hoe, the proper depth, suitable to the sorts of seeds intended to be so sown.

Sometimes, when very small drills are required for some particular fine or small seeds,

to be sown in a bed, border, or hot-bed, &c. we draw them with the end of the fingers, or with the end of a small flat stick.

Having, however, drawn the drills in either of the above methods, the seeds should generally be sown and covered in directly, if the ground is dry and in good order: but if the soil is wet, especially at an early season, it may be proper to suffer the drills to lie open exposed to the sun and air an hour or two, or more, to dry a little, particularly for tender seeds in early sowings, in the full ground, as just above observed, such as kidney-beans, &c.

As to the method of sowing in the drills, it is performed for the general part with a locked or close hand, discharging the seeds from between the fore-finger and thumb, as before related, scattering the seeds evenly along the bottom of the drill, some sorts requiring to be sown thinly just along the middle, such as in the angular drills drawn corner-ways of the hoe, for peas and many other larger seeds: also sometimes for smaller seeds when intended for edgings; but in the shallow flat-bottomed drills it is generally intended for the seeds to be scattered evenly the whole width of the drill, thicker or thinner according to the nature of growth of their respective plants, sometimes to remain, and in some sorts for transplanting; proper hints of which are generally exhibited in their culture, observing to cover in the seeds generally as soon as sown, as already hinted, raking or hoeing the earth evenly over them, just the depth of the drills.

Remarking, the work of covering, or turning in the earth in the drills over the seeds, may be performed occasionally both with the rake, hoe, and feet; but the rake or hoe is the most eligible for general practice for all smaller seeds, drawing the earth evenly into the drills a regular depth fully to the depth of the drill, whether deep or shallow; however as to peas, beans, kidney-beans, and the like larger seeds in large drills at wide distances, they are often covered in with the feet, by slipping them lightly along each side of the drill alternately, turning the earth evenly in over the seeds; but generally for all small seeds in close drills, it is proper to cover in with the rake or hoe, sometimes using the teeth of the rake, and sometimes the back occasionally, as it shall seem most convenient; observing that as soon as the drills are covered in by either of the methods, let the surface be lightly trimmed along with the rake, to smooth it and clear off large stones, &c.

In the husbandry Drill Sowing, the drills are generally drawn with the drill plough by horses,

horses, which effects that work very expeditiously, and for some seeds is so contrived as to draw the drills, sow the seed, and cover them in all at the same time.

BEDDING-IN SOWING.—This is another sort of broad-cast Sowing in beds, because the seeds are sown all over the surface, but in a different way from the above mentioned: in this method the ground being dug and formed into four or five feet-wide beds, with alleys, a spade width or more between bed and bed, and the earth being drawn off the top of the bed with a rake or spade half an inch or an inch or more deep into the alley, the seed is then sown all over the surface of the bed; which done, the earth in the alley is immediately, either with a rake, drawn spreadingly upon the bed again over the seeds the same depth, or spread over with a spade similarly, and the surface raked smooth.

This mode of sowing is often practised in the nurseries, especially in sowing some large sorts of seeds, and others occasionally, but not very frequently in kitchen-gardens, except in some parts of the North; it is not so expeditious as the broad-cast Sowing, but is nevertheless very proper for many sorts of small seeds, and many sorts of the tree and shrub kind, being a very regular method of Sowing so as to cover all the seeds an equal depth, and is performed two or three different ways, such as by rake, by spade, and by sifting.

In performing it by the rake, the ground is dugged in the common way, raking the surface as you go on, every eight or ten feet, standing on the undug ground to perform the raking; and when the plat of ground is thus digged and raked, mark it out into four-feet-wide beds with moderate alleys between bed and bed; then having a large rake, turning the teeth upwards, and with the back thereof shove the earth evenly from off the surface of the bed, a quarter or half an inch to an inch or more deep, as may be required, into the opposite alley in a little ridge all the way along; this done, sow the seed evenly all over the surface of the bed, then directly with the rake turned the right way, teeth downward, proceed to draw the ridge of earth out of the alley over the seed, striking the teeth of the rake smartly down on the farther side of the ridge of earth, and drawing it toward with a kind of jerk, make the earth spread evenly over the seed quite from one side of the bed to the other, proceeding in that manner, drawing one stroke after another to the end of the bed; then proceed to the next in the same manner, and so continue bed and bed till all is finished; then with a light rake gently trim the surface

smooth, and clear off stones and hard clods, as on former occasions.

In some places this method is practised almost in general in sowing all sorts of small seeds, and by many preferred as a very eligible method of broad-cast sowing, so as to cover all the seeds evenly an equal depth; it, however, is not near so expeditious for large grounds as the common broad-cast Sowing and raking in.

However, those that are used to this method of Sowing rid it off a great pace; sometimes two or three hands being employed on the same work, one shoves the earth from off the bed, another follows immediately after with the sowing, and this followed directly by a third, draws the earth over the seed, and so proceed bed and bed.

But nearly the same method of sowing is also sometimes performed with the rake and spade together, particularly when intended to sow any larger seeds a good depth, using the rake to shove or rake the earth from off the bed, into the alleys; or if it cannot be conveniently performed with the rake a proper depth, it is effected with the spade, trimming or paring the earth evenly off the surface, into the alleys; then sow the seeds all over the surface as before, and if they are of the larger berry, nut, or stone kind, or any other large seed, previous to covering them, press or pat them all evenly down into the earth, with the back of the spade; and then, either with the rake or spade, spread the earth out of the alleys evenly over them; though if it is a deep covering, especially if taken off with the spade, it is most eligible to use the same implement in returning it, being careful to spread it evenly to cover the seeds all equally a proper depth, smoothing the surface with the rake.

Another method sometimes practised in Bedding-in Sowing any common large seeds is, the ground being laid out in beds unraked, the seeds is sown on the surface, and with the rake strike it a little into the earth, then with the spade pare the alley, and cast the earth evenly over the bed, half an inch, or an inch or more deep, as may be required, and rake the surface even. This is also sometimes designedly practised in wetish ground, at an early season, when it does not readily admit of treading or raking. And by deepening the alleys, and raising the beds, it drains the moisture from the surface.

The method of Bedding-in Sowing by sifting, as formerly mentioned, is sometimes practised for several small or light seeds of a more delicate nature, that require a very light covering of the earth when sown. So in

order to bury them as shallow as possible, covering them in, by sifting fine earth over them out of a wire or chip sieve. Previous to Sowing such Seed, the surface of the bed, &c. is raked fine; then either shove the earth thinly off the surface of the bed with the back of the rake into the alley, making the surface as smooth as possible, and then sow the seed, smooth it down lightly with the spade, and sift the earth in the alley evenly over it, some very small sorts only just covered, not more than half a quarter or a quarter of an inch deep; or sometimes the surface being only raked as smooth as may be, without drawing off the earth as above, or sometimes also lightly smoothed with the back of the spade, then sow the seed, and let some loose fine earth from the alley, or some brought for the purpose, in a wheel-barrow, be sifted thinly over it, as just above-mentioned.

SPADE.

A spade is the most useful garden implement for digging, and preparing the soil for the reception of all sorts of seeds and plants.

There are several sorts and sizes of spades occasionally used, though the common large digging Spade is, in most places, almost commonly used for all kinds of digging and Spade-work, which however, in many instances, cannot be so conveniently used as a middling or small Spade; it is therefore eligible for every general garden to be furnished with three different sizes of Spades, to suit every department of gardening the more commodiously, such as the common large digging Spade, for all common digging and Spade-work as above observed, and a middling, and a small Spade for digging particular narrow compartments, and digging between small plants closely placed in beds and borders, &c. and in many other occasions.—See each as below.

Common digging Spade, &c.—This is designed for all common digging, and trenching of ground, and all kinds of strong Spade-work; so is of the largest size, being generally from fourteen to fifteen inches long in the plate, and nine broad, narrowing gradually half an inch, or an inch less at the bottom. Though in some of the kitchen gardens about London, where the ground is light and deep, they use spades full fifteen inches long in the plate; however, for the general part, a Spade of fourteen inches by eight or nine wide, proves the most handy size for all common digging in every district of gardening; but as they are made of different sizes, from twelve or fourteen to sixteen inches long in the plate, as aforesaid, so every one may suit

himself according to the depth and nature of his soil, and method of working.

Middling Spade.—Being as to size about a foot long in the plate, and seven or eight inches broad; which will prove very useful in light work, and in digging any small compartments, and between rows of small plants; also in flower beds, and borders; likewise in stirring, and fresh earthing the surface of beds occasionally, between close-placed plants of long standing; planting and transplanting many sorts, both in the ground, and in pots, and for many other sorts of light Spade-work.

Small Spade.—The size eight or nine inches long in the plate, and five wide, and is convenient in pointing up or slight digging, and in fresh loosening the surface between close-placed small plants, in beds and borders, &c. where none of the two former Spades can be readily introduced; likewise is useful in planting and potting many sorts of small plants, taking up small roots, and other light purposes occasionally.

Proper garden Spades have the plate wholly of iron, not above a quarter of an inch thick upward, growing gradually thinner from the middle downward; the tree or handle being generally of ash, about two feet long, and an inch and half thick, with a firm open handle at top, formed out of the solid wood, just big enough to admit of taking ready hold, one hand at top, and the other below.

Small Narrow Spade.—Having the plate about seven inches long, by three and a half or four wide; and is very useful in small compartments of beds, borders, &c. containing some particular close-placed, small plants of flowers, and others, both in occasionally slight digging, or loosening the earth between them with greater care and effect, than a larger sized spade; also sometimes in similar compartments in occasionally trimming round the bottom part of some straggling fibrous-rooted plants; and is often useful in taking up and transplanting small plants, and taking off root off-sets and slips, in particular sorts, in which a larger Spade would not be so commodiously handy.

Semicircular, or scooped Spade.—Besides the sorts of spades abovementioned, there is also another sort, of a smallish size, having the plate made semicircular like a scooped garden-trowel, and is very useful in taking up small plants with balls of earth, to preserve the ball more firmly about the roots.

All the sorts of Spades are sold by most of the nursery and seedsmen, and by the ironmongers; the prices being according to the sizes, from five shillings to half a crown; so

that the whole price of a set of spades is but trifling.

SPADICEUS *flos*, (from *spadix*) a flower, or an aggregate of flowers, produced on that particular receptacle called a *spadix*, which is protruded from a sort of calyx called a *spatha* or sheath, as in *Narcissus*, *Amaryllis*, snow-drop, &c. See **SPADIX**, **SPATHA**, and **SPATHACEÆ**.

Many of the bulbous and tuberous rooted tribe, produce Spadiceous Flowers, the principal of which are, *Amaryllis*, or lily daffodil, Guernsey lily, &c.—*Allium*, garlick, onion, leek, &c.—*Crocus*, all the varieties.—*Colchicum*, meadow saffron.—*Narcissus*, daffodil; jonquils, &c.—*Galanthus*, snow-drop.—*Leucojum*, greater snow-drop.—*Arum*, wake-robin, &c.—*Calla*, Æthiopian Arum.—*Orchis*, fool-stones, &c.—*Satyrion*, bee-flower.—*Ophrys*, twy-blade.—*Dracontium*, dragon-plant.—*Hæmanthus*, blood-flower.—*Crimm*, Asphodel lily.—*Pancratium*, sea-daffodil, &c. all of which are perennials, sending up stalks annually, terminated at top by that kind of calyx denominated a *spatha*, inclosing a *spadix* of flowers, and after obtaining a certain growth, the *spatha* or sheath bursts open, and protrudes the *spadix*, supporting sometimes but one or few flowers, and sometimes many. See **SPADIX**.

Many of the above plants are somewhat of the liliaceous tribe, or nearly allied thereto in their habit and structure; distinguished however, from others of the liliaceous tribe of plants by their *spatha*, out of which, the *spadix* of flowers is protruded; the other liliaceous kinds, having no *spatha* or any other sort of calyx; such as the White, and Orange Lily, Martagons, Crown-imperial, Tulip, Tuberoſe, &c.

SPADIX.

The particular receptacle and pedicles of spadiceous or spathaceous flowers above described, being protruded out of that kind of calyx, called a *spatha*; and sustains from one to many flowers, as in *Narcissus*, &c. See **SPATHA**.

The *Spadix* was originally applied to palms only, but it is now extended to all receptacles and pedicles of flowers, whether single or aggregate, that have a *spatha* or sheath for their calyx; which kind of calyx being in form of a sheath or scabbard, bursts lengthways and protrudes the *Spadix*. See **SPATHA**.

SPARTIUM, Broom.

Consists of shrubby flexible plants, of the deciduous and evergreen tribe, both hardy and tender, for diversifying the pleasure-ground, and green-house collections; all of upright moderate growth, with long rush-like shoots,

thinly garnished with trifoliate, and single spear-shaped leaves, and numerous papilionaceous flowers.

Class and order, *Diadelphia Decandria*.

Characters.] **CALYX** is monophyllous, tubulous, heart-shaped, with a short margin, having five small denticles. **COROLLA** is papilionaceous, with five petals, consisting of a large obcordated, wholly reflected vexillum, two oblong-oval wings shorter than the standard, annexed to the filaments, and a dipetalous, oblong, hairy carina, situated below the wings. **STAMINA**, ten unequal, diadelphous filaments, with oblong antheræ. **PISTILLUM**, an oblong hairy germen, awl-shaped, rising style, having an oblong hairy stigma. **PERICARPIUM**, a long, cylindric, obtuse, bivalvovous, unilocular pod, containing roundish seeds.

There are many species in this genus, all of shrubby growth: the first of which grows wild abundantly in England, &c. all the others are exotics, chiefly from Spain, Portugal, Italy, and other southern parts of Europe, and the Levant; about six or seven species are retained in our gardens as flowering-shrubs, for variety and ornament in the shrubbery and green-house collection. Some of them being very hardy, others somewhat tender, requiring shelter of a green-house in severe winters.

Hardy Kinds.

About three or four species are hardier than the rest, and succeed in the open ground in all weathers the year round; the first of which is our common English Broom, and the others are originally from abroad, the countries above-mentioned.

1. SPARTIUM *scoparium*.

(*Sweeping Besom Broom*)—or *Common English Broom*.] Rises with a shrubby flexible stem, and numerous, angular, smooth, green, flexible branches, five or six feet high; ternate and single leaves; and numerous bright-yellow flowers all along the sides of the young branches in May and June, succeeded by plenty of ripe seed in Autumn.

This plant grows wild in sterile grounds in England, and most parts of Europe, and not very commonly admitted into gardens, only in some extensive shrubberies, for the variety of its singular growth, and conspicuous bloom of flowers. In the country it being made into besoms, thence denominated Brooms; hence the name *Spartium scoparium*, Sweeping Broom.

2. SPARTIUM *Juncum*.

Rushy Spartium, or *Common Yellow Spanish Broom*.] Rises with a shrubby stem, and cylindric, opposite, flexible, rush-like, green branches

eight or ten feet high; small lanceolate leaves; and the tops of the branches floriferous, being terminated by loose spikes of large yellow flowers, from July till September, succeeded by plenty of seeds in autumn.

Variety.] Double-flowered Spanish Broom; producing large full double-flowers, but no seed.

3. SPARTIUM *radiatum*.

Starry Italian Broom.] Grows two or three feet high, with numerous angular opposite branches all around, assuming a bushy growth; ternate, linear, close-fitting, opposite leaves, having the folioles spreading round the stalks in a radius; and clusters of yellow flowers at the ends of the branches, appearing in June and July.

Of the above three species, the two latter are the most commonly cultivated, having been long residents of our shrubberies: all three, however, succeed any where, producing abundance of flowers and seed annually; and from the scattered, or self-sown seeds, many young plants often rise without care, the following spring.

Tenderer Kinds.

The following sorts being rather of a more tender nature, especially while young, are often potted, and treated as green-house plants; yet they mostly stand our moderately sharp winters, tolerably in the full ground; it is, however, proper to pot some for shelter in winter, and plant some in the full ground in a warm situation, to take their chance.

4. SPARTIUM *monospermum*.

Single-seeded, White Spanish Broom.] Grows six or eight feet high, with numerous angular, rush-shaped, silvery branches; small spear-shaped leaves; and lateral clusters of numerous white flowers along the sides of the branches, in July and August; succeeded by pods containing a single seed only.

Variety.] With yellow flowers.

This species being moderately hardy, is very commonly planted in the open shrubberies, as an ornamental flowering shrub; it is however proper to retain some also in pots, especially while young, to have occasional shelter from severe frost.

5. SPARTIUM *spinosum*.

Spiny Italian Maritime Broom, or Prickly Gytisus.] Grows five or six feet high, with angular slender branches, armed with spines; ternate, thinly placed leaves, and clusters of bright-yellow flowers at the ends of the branches, in June and July.

6. SPARTIUM *Scorpius*.

Spreading Prickly Spanish Broom.] Hath

spreading spinous branches, oval leaves, and largish yellow flowers, in July and August.

7. SPARTIUM *angulatum*.

Angulated Eastern Broom.] Grows six or eight feet high, with numerous sexangular branches, garnished with single and ternate leaves; and the tops of the branches floriferous, being terminated by loose spikes of pale-yellow flowers, appearing in July.

8. SPARTIUM *sphaerocarpum*. — Spherical-fruited Spanish Broom.

9. SPARTIUM *complicatum* — Complicated Montpelier Broom.

All the above species of *Spartium* rise with shrubby durable stems and branches, mostly of a flexible nature, the branches in particular being very slender and pliable, producing long rushy green shoots, generally, however, assuming an erect growth; the leaves generally small, and thinly placed, and the flowers moderately large and conspicuous, all of the papilionaceous or butterfly kind, with five petals, as in the *Characters*, and mostly of a strong agreeable odour; succeeded by long cylindrical leguminous seed-pods, ripening in autumn: though some of the foreign sorts do not always ripen plentifully in England, but are obtained in abundance from Spain, Portugal, and countries adjacent.

They all grow naturally in most of the southern parts of Europe; and the first sort, *Spartium scoparium*, also in great abundance in this country, in barren uncultivated lands, often proving a most troublesome plant to extirpate in grounds intended for cultivation.

As to the merit of all these shrubs, in gardening they may be all employed as flowering shrubs, or furniture to embellish the shrubbery compartments; the Common Spanish Broom, Radiated, and Monospermous kinds, &c. particularly, are the most common sorts in the English gardens; and the *Spartium scoparium* is also often thinly interspersed in extensive shrubberies, to increase the variety: but all the species, both hardy and tenderer kinds, may be exhibited in the shrubbery plantations; being careful, however, to station the tenderer sorts in the warmest situations, to take their chance of all weathers the year round, in common with the hardiest kinds.

It is, however, also proper to have some of the tenderer kinds always in pots, to be treated as green-house exotics, for the greater certainty of preserving the species, in case the others in the shrubbery should suffer by the severity of rigorous winters.

Most of these plants having long naked or thinly fibrated roots, often inclining to run down

down with a long tap-root, should generally be planted where they are finally to remain while young, as they do not succeed well, if removed when large and old.

All the sorts may be planted for their different purposes, either in autumn, any time in October or November in open weather, or in the spring, in February, March, or beginning of April, and may be planted in any common soil of a garden, will continue in growth many years, and flower abundantly every summer and autumn, in their respective season very conspicuously and ornamentally: and as to culture, those in the shrubbery require only what is necessary for the other shrubs in assemblage, keeping clear from weeds in summer, digging between them every winter or spring, at the same time pruning any disorderly growths, and casual decayed shoots, &c. and the tenderer kinds in pots, have the occasional culture of green-house plants.

They are raised in abundance in all the public nurseries for sale.

Method of Propagation, &c.

They are all propagated by seed in the full ground, sown in the spring of the year; and the double-blossomed varieties, &c. by layers and cuttings.

Some of the sorts ripen plenty of seeds in this country, but that of all the sorts is procured in abundance by the nursery and seedsmen for sale; which should be sown in the beginning of April, in four-feet-wide beds of common earth, either in drills near an inch deep, or bedded in that depth; they will soon germinate, and the plants rise freely in a short time, giving occasional watering and weeding all summer; and in winter, it is eligible to hoop the beds of the tenderer sorts, in order to be matted in frosty weather; and in the spring following, it is advisable to prick out the whole in nursery rows, it being proper to remove them out of the seed-beds, when but one year old, on account of their tap-root aforesaid, which should now be shortened; then plant them in rows two feet asunder, and one foot apart in each row; here to remain two or three years, or till advanced to two or three feet growth, then transplanted finally into the shrubbery; planting also some of the seedlings of the tenderer kinds, immediately from the seed-bed into pots, and placed in the green-house in winter.

Observe however, in raising the tenderer sorts, that, for the greater certainty of success, it will also be proper to sow some in pots, plunging them in a shady border all summer;

where the plants will come up freely, being careful to remove them under a garden-frame, or green-house in winter, to have shelter till spring, then pot the seedlings off separately as above, in order to be managed as hardy green-house plants; and in a year or two, having acquired strength, some of them may be turned out into the full ground, and some retained in pots, placed among the green-house exotics.

By Layers and Cuttings.—The double blossomed Spanish Broom, and the other varieties, not continuing the same from seed, must be propagated by layers or cuttings, to preserve the sorts with certainty. Make the layers in autumn or spring, and plant the cuttings in spring or summer, some in the full ground, others in pots, and plunged in a hot-bed to forward their rooting.

SPATHA, a Sheath.

Being the common calyx of the spadiceous flowers; and which, being in form of a sheath or scabbard, bursts open on one side, longitudinally, from bottom to top, and protrudes the *spadix*, a sort of receptacle and pedicles sustaining the flowers, consisting sometimes of but one, and sometimes of many florets. See SPADICEUS Flos, and SPADIX.

Examples of the Spathaceous plants are *Narcissus*, *Amaryllis*, *Galanthus*, and *Crocus*, &c. See SPADICEUS Flos.

The *Spatha* always terminates the main flower-stalk, is mostly of an oblong form, and sometimes globular, as an onion and leek, &c. closely inclosing the *spadix*, till the flowers acquire maturity enough to burst it open, and consists either of one piece, as in the greater number of spathaceous plants; of two, as in some few sorts; or of a number of scales placed imbricatum, as in the plantain-tree.

SPATHACEÆ *Plantæ*, (from *spatha*, a sheath.)—Spathaceous plants, such whose flowers are protruded from a *spatha* or sheath. See SPATHA.

SPATHÉLIA. (*Spathelia*.)

One species, a shrubby exotic from the West Indies, retained in some of our stove-collections, rising with a high stem, garnished with pinnated leaves, and racemes of flowers; having five-leaved cups, five petals, five stamina and three styles, succeeded by trilocular capsules, with three seeds singly in each cell.

Class and order, *Pentandria Trigynia*.

The species is,

SPATHÉLIA *simplex*.

Simple-stalked Jamaica Spathelia.] The stem single; with frondose pinnated, tufted leaves;

leaves ; and with flower-racemes most simple, loose and terminal.

This plant must be kept in pots and stationed in the stove ; is propagated by seeds, layers, cuttings, &c. in pots plunged in a bark-bed.

SPAWN, a progeny or off-spring.

In gardening, is often applied to such small off-sets, suckers, and sprouts that rise numerous from the roots, &c. of certain plants, serving for the purpose of propagation.

Therefore this small Spawn, or off-spring of vegetables, may be considered as parts similar to the whole plant, as that being separated from the parent vegetable, and planted, they readily grow, and commence proper plants, and thereby renew or propagate their respective species with great facility and abundance.

But Spawn among gardeners, in the general acceptation, is more peculiarly applied to the progeny of mushrooms, being an off-spring from the root of those *fungi*, consisting of minute white parts, shooting and running in the earth or dung, like small white, thready fibres, assuming the appearance of slender white strings, productive of numerous minute white knobs, appearing at first the size of small pin-heads, the whole smelling strong of the mushroom ; and those little knobs being infant plants, they gradually increase in size to proper mushrooms, which are quick of growth, and of very short duration ; but the same Spawn running in the earth, &c. furnishes a plentiful supply of mushrooms from the bottom in regular succession, for a considerable time, sometimes for several months.

So that mushrooms propagate in great abundance by this Spawn detached from the root, and is the only method of propagation yet discovered, for raising them by the progress of horticulture : for the lumps of spawnny earth or dung being planted in a sort of hot-bed of horse-dung, the spawn soon vegetates, and increases considerably, furnishing mushrooms in a short time fit to gather ; these hot-beds in which we deposit the mushroom Spawn, being always made with new horse-dung from the stables, previously fermented in a heap, to evaporate the first violent heat, then formed in a long narrow ridge from three to four feet wide and three feet and a half high, like the roof of an house to shoot off the wet ; and having remained exposed to the weather two or three weeks or more, till the great heat abates, the lumps of Spawn are planted all over every part of the bed at little distances, just within the surface ; and the bed is then earthed all over an inch or two thick, and closely covered a foot thick, with dry li-

ter ; thus the moderate heat and peculiar quality of the dung, sets the Spawn a working, so as often to produce plenty of mushrooms in six or eight weeks : and the same bed frequently continues furnishing a supply five or six months, or longer ; but new beds must be made every year, or probably two or three times in that period, whereby to furnish a constant succession of mushrooms. See AGRICUS.

Thus, through the effects of the peculiar warmth and quality of horse stable-dung, consisting of the moist litter, and plenty of the short stuff together, formed into a hot-bed as above, the mushroom Spawn increases, furnishing both mushrooms, and sometimes a supply of young Spawn for future beds : likewise any common horse-dung hot-beds, horse-dunghills, &c. moderately rotted, are often productive of a great deal of good mushroom Spawn naturally ; probably from some fine spawnny matter, or the mushroom seed having accidentally mixed in the dung or earth, &c. And thus the Spawn produced by either of these effects, is the only certain resource yet known for propagating that species by art, no seed having as yet been sufficiently discovered, by which we can raise this plant ; but the Spawn from the root, being as it were living foetuses or infant plants, which renew their species as certainly as seed.

However, besides this Spawn or off-spring of the root, the naturalists in botany are agreed that mushrooms have also generative organs, and produce flowers and seed like other plants, and naturally propagate themselves also by seed, as well as by the Spawn ; but from the exceeding minuteness both of the genital organs and seed, and their great obscurity, or concealed situation, they yet remain invisible ; though it is supposed they are contained in the *lamellæ* or gills of the mushroom, and which, when full-grown, discharges the seed upon the adjacent ground, and thence probably some is disseminated by the winds, &c. to other distant soils and situations adapted to their growth ; and penetrating into the earth, grow and become mushrooms, the roots of which multiply and furnish proper Spawn also for the work of propagation.

But it was long the opinion of many, that mushrooms never possessed the power of propagation at all, but supposed to owe their existence to the putrefaction of earth, dung, &c, which doctrine, however, is now sufficiently refuted.

For mushrooms being proper plants, they, either by Spawn or seed, or both, propagate themselves

themselves like other vegetables; and it is probably from the dissemination of the seed, to peculiar soils and situations, that we often find both mushroom Spawn and mushrooms growing in obscure places.

By Spawn, however, in particular, it is obvious that mushrooms propagate themselves plentifully, and by which, with proper garden culture, we can raise abundance of mushrooms at pleasure.

Therefore the mushroom cultivators always furnish themselves with a sufficient quantity of fresh Spawn, for every new bed, procuring it all times of the year, but more plentifully towards the end of summer, and in autumn, from the places of its growth, such as old mushroom-beds; any old horse-dung hot-beds, and horse-dunghills, that are moderately dry, and remained undisturbed several months; also sometimes in old compost heaps, consisting chiefly of horse-dung; in all of which the spawny substance discovers itself in dry lumps of dung and earth, which lumps should be taken up entire, as hereafter noticed; likewise in stable-yards, where any quantity of horse-dung has lain dry and undisturbed any considerable time, lumps of Spawn are often obtained. It is also found in fine perfection in the horse rides belonging to great inns, livery stables and horse-dealers, such as about London, &c. which rides being places to exercise the horses under cover to shelter them from wet, and the ground spread thick with the short dung from the stables for the horses to tread on more lightly, being generally permitted to remain some considerable time without cleaning out, and being always dry, upon examining towards the sides next the wall, is frequently found most excellent mushroom-Spawn in large cakes; likewise in horse-mill tracks, where horses are constantly employed in working mills, engines, and other large machinery, and they dunging, &c. in the tracts, it being occasionally swept up towards the sides, and the bottom sometimes permitted to lie some considerable thickness a long time, upon turning it up, are frequently found fine lumps of strong Spawn: also in kitchen gardens, where any piece of ground having been dunged in the spring, with new or but moderately-rotted stable-dung, or old dry hot-bed dung, &c. probably having embryo Spawn already formed therein, and which dungs happening to be but slightly digged in, or covered but a moderate depth with earth, sometimes is productive of clusters of mushrooms in patches, towards autumn in dry seasons, and in which places we often find lumps of very good Spawn: in all the above places the Spawn is met with

occasionally at all times of the year, but more certain and plentiful towards the end of summer, and in autumn, before perished by the wet and cold in winter; being found in dry lumps, and cakes of dung and earth, appearing, as before said, white and stringy, smelling strong of the mushroom.

And sometimes mushroom Spawn is produced naturally all over the surface of an old cucumber, or melon hot-bed, both in the dung and earth, in autumn or winter, where the frame and lights have been continued over the bed; and I have sometimes observed, that where the earth of the bed was of a loamy nature, the Spawn has been remarkably fine and strong, for in this kind of earth, of a moderately-light quality, the Spawn is generally superiorly substantial, increasive, and productive; so as sometimes in old beds as above, in which Spawn is discovered, the frames and glasses remaining, and the surface of the bed covered thickly with dry straw, litter, or hay, under the glasses, have produced a full crop of mushrooms towards the spring, large, thick of flesh, and of a peculiar firm texture, and rich flavour. See AGARICUS.

But mushroom Spawn is also obtained in meadows and pastures towards the end of summer, and in autumn, before the rain and cold commences; the months of August and September being generally the proper season when the mushrooms rise naturally, serving as a direction to the place to find the Spawn; then carefully opening the ground, the Spawn will appear in the earth as above, which may be digged up in lumps, and carried home in baskets for use; this field Spawn however, cannot always be so readily obtained in any considerable quantity; and as it is found only in pasture grounds, it may be very inconvenient to break up, and spoil the sward in search of it; besides, many poisonous sorts of *fungi* grow in the fields, also from Spawn; we ought to be cautious when we are gathering Spawn for mushroom beds.

From the above hints of the places of growth of mushroom Spawn, we may readily know where to obtain it in sufficient quantity for the purpose of spawning mushroom beds.

But after all, garden or bed Spawn produced in any horse-dung beds, heaps or lays of horse-dung, &c. before mentioned, is preferable to the field Spawn for garden culture, it generally producing much thicker, more fleshy, and firmer mushrooms, of a richer flavour.

Therefore, it is incumbent on us to preserve

five all the lumps of young fresh Spawn, such as we occasionally meet with in any old dung hot-beds, dunghills, &c. laying the lumps up in the dry till wanted; rejecting, however, any very old worn-out Spawn, as far as it can be distinguished; and the virgin Spawn, or such that has not been in production, generally yields the finest mushrooms; for sometimes, even the young off-spring Spawn of such that have been long worked from bed to bed, is apt to degenerate, there being often a very material difference in the goodness of Spawn; that which is fresh and full of heart, will often produce abundance of fine mushrooms for several months in the same bed; but such that is worn out or degenerated, send up only a flash of trifling little heads at first, of no substance, and probably never produce any more to signify.

There is also a fruitful and barren sort of mushroom Spawn: the former is distinguished by the substance of the fibry or stringy white shoots, &c. and mushroom-like smell, as before observed; but in the base sort, the thready fibres are considerably more abundant, fine, and downy, often appearing like a fine white down, and being of no substance, produce only a flash of small white *fungi* destitute of the fleshy part, and which by the mushroom men is commonly called white-cup; and by not perfectly distinguishing it, many have been disappointed in their crop.

It is observable that horse or stable-dung of all others is the most remarkable for promoting mushroom Spawn, even often alone in the dung-heap, without any addition of earth, though having a small portion of any earthy substance, it may probably have the greater effect; for new horse-dung consisting of the wet litter, and the short stuff together from the stables, but the more short the better, and being collected in any considerable quantity, either in any common hot-beds, or remaining in the dung-heap a considerable time, it often becomes of a certain agreeable temperament, peculiar to the growth of mushrooms, especially if it does not burn in its collected state, by the first violent heat; and that after remaining from winter or spring, until autumn or spring following, it frequently furnishes lumps of excellent Spawn.

Methods are sometimes practised to obtain Spawn more abundantly by art, by the effects of horse-dung, both in hot-beds and in compost heaps; sometimes in the former case, by planting small pieces of Spawn, or spawny earth along the top edge of the later cucumber hot-beds in summer, or in the sides of any horse-dung heaps, having a little warmth re-

maining; so that the moderate heat of the dung in the bed or heap, sets the Spawn a-running, as sometimes both to produce a few mushrooms in autumn, and increase considerably for future use in spawning proper mushroom beds. And in the second case, it is performed by a compost of dung and loamy earth together; procuring in spring, or early in summer, a quantity of fresh horse-dung, consisting of plenty of short stuff, and a due proportion of long together; and casting the whole in a heap to ferment a fortnight or a month, that the rank burning vapour may pass away; then having some loamy earth, or other good substantial mould, or any spawny soil from old beds, form the dung into a long narrow ridge, mixing some of the earth occasionally towards the outside, and in a fortnight or three weeks, the heat becoming quite moderate, cover the whole with a dry long litter to defend it from the wet, permitting the whole to remain some considerable time; and thus probably some generating substance of mushrooms, either Spawn, or seed, or both, having by some means previously, and accidentally introduced itself in the compost, which by its certain warmth and quality promotes its vegetation, and increase, as sometimes in three or four months to furnish a good quantity of eligible Spawn.

Observe, in collecting the mushroom Spawn found occasionally in all the afore-mentioned places of growth, the lumps of dung and earth, in which it appears, should be taken up as entire as possible in a basket, and carried into some dry shed or other apartment, there deposited till wanted; or may plant it directly if the bed is ready, otherwise lay it up close in some dry apartment, or put it up in hampers, covering the whole thickly with dry litter or garden-mats: and here it may remain till wanted, for the purpose of spawning mushroom beds, as it will retain its vegetating property several months; and the drier it is kept in moderation, the better it will improve in its vegetable faculty, and take more freely with the bed when planted.

About London good mushroom Spawn is a valuable article among the kitchen gardeners, who raise great quantities of mushrooms for the markets, and in consequence thereof, some of their labourers make it their business, at certain times of the year, but more particularly in autumn, to go about to different places collecting it, which generally pays them well for their trouble, as they find a ready sale for it, from three or four to five or six shillings per bushel.

Whosoever may have occasion to purchase
Spawn

Spawn from the environs of London, will meet with it most readily in the Neat-house gardens near Chelsea; also in the neighbourhood of Lambeth, Battersea, Hammer-smith, &c. or by application in Covent-garden, Spitalfields, or Newgate Market, on a market day morning, to the gardeners who attend there with their vegetable goods for sale; and also at most of the principal nurseries.

It may be packed up in hampers, and sent to any distance, either by land or water-carriage.

For further particulars respecting the Spawn, and the general directions for the different methods of making, Spawning, and whole management of mushroom beds, see the article AGARICUS.

SPECIES.

The species of plants, being the individual plants of a genus or family of vegetables, consisting of one or two to numerous species, in different genera.

The Species of a genus are an assemblage of plants, which resemble each other in the most essential parts; that is, the characteristic mark of distinction of a genus must run through all the Species of the same family invariably, in the principal characters that constitute the said genus, which is always founded on the fructification, i. e. the different parts of the flower and fruit, &c. so as the respective Species of any particular genus are thereby distinguished from those of all other genera; and therefore the Species of a genus may in a manner be compared to the relations of a family, which all bear the same surname, although every individual is distinguished by a particular specific name; for so it is with the Species or plants of a genus, all having the same generical name prefixed to that of the specific.

Though it may be observed, that Species of the same genus often differ very materially in the appearance of their general habit, nature, and dimensions of growth; as sometimes in the same genus are comprehended both trees, shrubs, and herbaceous plants, which, although thus ultimately different in the general appearance, are found to possess invariably certain generical relations in their essential parts in the characteristic distinctions, such as those of the flower and fruit; and thus all those of the same genus are arranged under one denomination, termed the generic name.

The Species of a genus sometimes consist of only one or two, and in some many or numerous different sorts, although it is in but very few instances that a genus consists of only one Species, such as in Superb-lily, Flowering-ruth, Tamarind, African Fly, Ho-

ney-suckle, Hop, &c. but more generally most genera are composed of a greater number, some of many Species, as in Aster, Campanula, Sunflower, Geranium, Saxifrage, Oak Tree, Ash, Willow, Honey-suckle, and numerous others; and many of which comprise numerous Species, extending in some to fifty, sixty, to an hundred or more different sorts, as may be observed in some merely botanic books; though probably, in some genera, not one quarter of those great numbers are cultivated plants, or that possess any merit for garden culture, or any other materially useful purpose; as sometimes many of the Species therein enumerated are wild or noxious weeds; in other cases many genera, of smaller or moderate extent, consist mostly, or in the greater part, of estimable plants, either principally for introduction in the different districts of gardens and plantations, or for some essential economical occasions in trades, &c.

So that, according to our plan in the process of this work, displaying the general practice of gardening, systematic arrangements and descriptions of the various genera and Species of garden plants, and the essentials of horticultural botany, we, in the arrangement of the Species of the respective genera, omit the useless and improper, and only introduce principally those of all the more valuably useful, estimable, or desirable plants, trees, shrubs, flowers, fruits, &c. as possess some requisite degree of merit, according to their respective kinds, proper for horticultural purposes, either useful, ornamental, or curious, &c. in the several garden departments, such as the kitchen garden, fruit-garden, pleasure-ground, flower-garden, shrubbery and plantations, greenhouse and hot-house, &c. all arranged systematically, with their general and particular description, respective and general uses, methods of propagation and culture.

Generally Species of the same genus possess, in some degree, similar medical powers, and often in domestic and other economical uses; such as is exemplified in the genus *Allium*, consisting of the garlick, onion, leek, shallot, cives, &c. the *Brassica*, comprising the Cabbages, Savoy, Broccoli, Cauliflower; the *Laurus*, containing the Bay, Benjamin Tree, Sassafras, Cinnamon; and the genus *Artemisia*, comprehending the Mugwort, Wormwood, and Southernwood, Tarragon, &c. and in various other instances.

SPERMATOCOE, Button Weed.

An annual and shrubby plant for the stove, garnished with linear or spear-shaped leaves, and monopetalous flowers.

Class and order, *Tetrandria Monogynia*.

[*Characters*.] CALYX, a small four-toothed
6 U perma.

permanent cup. COROLLA, monopetalous and funnel-shaped, with the border cut into four obtuse, reflexed, spreading parts. STAMINA, four awl-shaped filaments, topped with simple antheræ. PISTILLUM, a roundish compressed germen; style, the upper part bifid, crowned with blunt stigmata. PERICARPIUM, two oblong capsules, joined together, containing single roundish seeds.

There are several species of this genus: these for our purpose are,

1. SPERMACOE *tennisoni*.

Slender Button-weed.] Is annual, and rises to the height of two feet and a half; the branches and leaves come out by pairs; the leaves are linear and smooth; the flowers grow in slender whorls toward the top of the stalk; they are small and white, and are succeeded by horned capsules.

2. SPERMACOE *verticillata*.

Whorled-flowered Button-weed.] Rises with a shrubby stem three or four feet high, furnished with a few slender branches, garnished with smooth, lanceolate leaves, growing in whorls; the flowers come out near the top of the branches in globular whorls, of a very white colour.

The propagation of these plants is by seeds, sown on a hot-bed in spring, and when come up, must be transplanted into single pots of earth, and replunged to forward them; afterwards they must be removed to the stove, and treated as other plants of the like kind.

SPICA, a Spike.

A mode of inflorescence, or manner of flowering, peculiar to many plants; consisting of a simple peduncle or flower-stalk, supporting many flowers all along its sides, without any pedicle or partial foot-stalk, but are sessile, or sit close to the main stalk, generally in alternate arrangement.

But the florets of a Spike are also sometimes single-rowed, and sometimes double-rowed, &c.—When single-rowed (*Spica secunda*) the flowers are all turned towards one side; and double-rowed (*Spica disticha*) when they stand two ways.

SPIGELIA. Worm Grass.

Consists of an annual and perennial plant, with quaternate or opposite leaves, and monopetalous funnel-shaped flowers.

Class and order, *Pentandria Monogynia*.

Character.] CALYX, a monophyllous, five-parted, pointed cup. COROLLA, monopetalous and funnel-shaped; the tube is long and narrow at bottom, the border is spreading and cut into five pointed segments. STAMINA, five filaments, topped with simple antheræ. PISTILLUM, a germen composed of two globose parts, with a subulate style and simple

stigma. PERICARPIUM, a twin bilocular capsule, containing many small seeds.

The species are,

1. SPIGELIA *anthelmia*. (*Annual.*)

Worm Grass of America.] Hath a fibrous root, from which arises an erect herbaceous channeled stalk a foot and a half high, garnished with four oblong-oval, pointed leaves, placed crosswise round the stalk; from the joints of the stalk are produced two small branches placed opposite, furnished with lesser leaves, and short spikes of herbaceous flowers ranged on one side of the footstalks.

2. SPIGELIA *marilandica*. (*Perennial.*)

Maryland Worm Grass.] Hath a perennial fibrous root, from which arise two or three erect stalks, eight or ten inches high, garnished with oval pointed opposite leaves in pairs, the stalk is terminated with a spike of flowers ranged on one side; the outside of the flower is of a bright-red, and inside of a deep-orange colour, making an elegant and beautiful appearance in June and July.

These plants are esteemed in America for their efficacy in destroying worms.

The first species is propagated by seeds sown on a hot-bed in the spring, and treated as other tender annuals.

The second species, although hardy, ripens not its seeds in England; the propagation is by parting the roots in autumn or spring.

SPINA, a Spine or Thorn.

One of the armature of plants, and are protruded immediately from the wood, being an expansion of the ligneous body; by some compared to the horns of animals, which adhere to the bones of the skull; so that the Spine or Thorn differ from the prickle, *aculeus*, which are detached only from the bark, and not so strong and hard as Spines. See ACULEUS.

Spines are intended by nature as armour to certain plants, to keep off cattle and other animals that would injure them.

Thorns arise either upon the stem and branches, as in buckthorn, boxthorn, white-thorn, sloe, wild-plum, pear, orange, triple-thorned acacia, false-acacia, furze, and many others of the tree and shrub-kind; or on the leaves, as in holly, American aloe, acanthus, thistle, Adam's needle, juniper, butcher's-broom, &c. On the calyx, as in thistle, centaury and mad-apple; or on the seed-vessel and fruit, as in thorn-apple, prickly spinach, &c.

Spines rise either singly, as in most spinous plants; doubly or by pairs, as in many sorts; and triple, as in the three-thorned acacia.

By culture many plants lose their Spines, as plum, pear, medlar, orange, citron, &c. and the leaves of holly by age.

SPINACIA,

SPINACIA, Spinach.

Spinach is a noted culinary herb of the annual tribe, valuable as an esculent for its large leaves for various culinary purposes most times of the year; having broad triangular and roundish leaves, rising in clusters close to the ground; succeeded by upright tall stems, supporting spikes and clusters of small apetalous male and female flowers on separate plants.

Class and order, *Diœcia Pentandria*.

Characters.] CALYX, diœcious flowers, having in the males a calyx cut into five oblong, obtuse, concave segments; and in the females is monophyllous and permanent, cut into four acute parts, two of them being very small. COROLLA, no petals. STAMINA, five capillary filaments, with oblong didymous antheræ. PISTILLUM, in the females a roundish compressed germen, and four hair-like styles with simple stigmas. PERICARPUM, no seed-vessel; the seed is roundish, and lodged in the permanent calyx, and is either thorny or smooth in the different varieties.

There are but two species in this genus, one of which only is cultivated, being the common culinary Spinach, comprehending two valuable varieties; namely, triangular leaved, with prickly feed,—round-leaved, with smooth feed: the former being the hardiest, is more valued for the winter crop; but the latter having larger, thicker, and more succulent leaves, is preferable for spring and summer.

The species is,

SPINACIA *oleracea*.

Common Culinary Spinach.] Hath a somewhat spindly fibrous-root, crowned with a tuft of large, broad, triangular, and roundish leaves on foot-stalks, close to the ground; and when it shoots for seed, rises with upright, hollow branchy stalks three feet high, producing spikes and clusters of numerous small, apetalous, greenish flowers, male and female on separate plants; succeeded in the females by roundish close-fitting seeds, in some armed with spines, in others smooth.

Remarking, the male plants generally produce their flowers in spikes, and the females in close clusters at every joint.

Varieties.] There are two remarkable varieties of this species, each of which was formerly considered as a distinct species; but are only varieties of one and the same species, their specific determination being in the close-fitting seeds, *fructibus sessilibus*, which is exactly the same in both varieties; there is, however, a pretty permanent distinction in their leaves and seed; one variety having tri-

angular arrow-pointed leaves, and prickly seed; the other having roundish leaves and smooth seed, as below.

Triangular Spinach with Prickly Seed.] Hath large, triangular, arrow-pointed leaves, five or six inches long or more, being broad and angular each way at the base, running up to a narrow point at top; and the seeds are mostly armed more or less with short spines.

Round Spinach with Smooth Seed.] Hath large roundish or oval leaves, five or six inches broad or more, of a more thick, fleshy, succulent consistence; and the seeds more round, mostly free from spines, and quite smooth.

Both these varieties admit of some variations in the shape and size of the leaves; the broadest and thickest leaved sorts are consequently superior in goodness; remarking of the Round Spinach in particular, some will have roundish leaves, others oval or oblong, and one sort exhibits itself with much rounder, broader, and thicker leaves than the others, generally of a more stocky and luxuriant growth, and stronger green colour, and is the most valuable variety of the round-leaved kind: but observing both of the triangular and round-leaved varieties, we should endeavour, as much as possible, to mark the most stocky and broad-leaved plants to run up for seed, in order to obtain and continue the proper breed of such eligible varieties only, as well as possible, sufficiently for general culture.

As to the merit of each variety,—the triangular Spinach being of a more hardy nature, is generally cultivated for the main winter crops; and the round-leaved sort claims precedence for the size and thick consistence of its leaves, but being more succulent, is not quite so hardy as the other to stand the winter; it is cultivated principally for the spring and summer crops.

Both the varieties are herbaceous annuals, that succeed in the open ground, requiring to be raised annually from seed sown in an open situation, in spring, summer, and autumn, to remain where sown; and the plants coming up in a fortnight, they attain perfection for use in two or three months; in which those sown in spring and summer remain but a short time in full perfection, and then run up to stalk, producing flowers and seed, and totally decay, root and all, the same year; but those sown in autumn come up the same season, and stand the winter till next spring, but not longer than April or May, before they run to seed, and perish as soon as it is ripe.

They commonly flower in June; and when

in flower, the male and female plants are then distinguishable, the former generally producing the flowers in spikes, having the flowers furnished with the stamina, sustaining a yellow farina, being the male dust for the impregnation of the flowers of the female plants, which have no stamina, only the female organs, the germen and styles, on which the male plants naturally discharge their farina, and soon after decay; but the female plants continuing their growth, and being thus fecundated, the embryo seeds grow fast to perfection, being also thereby fertilised or rendered prolific, as that when sown they will readily grow; for without the vicinity of the male flowers, many of the females would prove abortive, and all the seeds sterile; which determines how necessary it is in Spinach, and other dioecious plants, to have a sufficiency of the males to impregnate the females.

Spinach is obtained for use almost the year round by different sowings, from January till August or September, at about a month's interval between the early sowings, two or three weeks in the main spring crops, and not more than a fortnight in summer; for the plants of each crop of the spring and summer sowings will not continue longer for use, before they will fly up to seed; but the autumn sowings, performed from about the middle or latter end of July, to the middle or end of August, do not run so soon, more especially those sown in August, which is the only proper season for sowing the winter crops, and which coming in for use in October, continue all winter and spring, until May, then shoot up to seed; being succeeded abundantly by the spring-sown crops, as above.

As to the culture of Spinach, it is very easy: both the varieties may be raised in any situation from seed, sown either broad-cast and raked in, or in drills; the plants remaining where raised, require only a little thinning and clearing from weeds; however, there being several material hints necessary to be generally known in order to obtain Spinach in full perfection in the different seasons of the year, we will therefore treat of its culture accordingly; first exhibiting hints for its general culture, afterwards the culture of each variety, separately in the different seasons.

Of its Propagation and General Culture.

The propagation of Spinach is effected only by seed, as being an annual, sowing it every year in spring and autumn; the former season of sowing furnishing the main spring and summer crops; and the autumn sowings in August furnishes Spinach all winter, and for early spring use, until May.

It may be sown at several intervals of time, from January till August, as every month, three weeks, and fortnight, according to the earliness or advanced period of the season, so as to obtain a regular succession of Spinach most part of the year; the spring and summer sowings attaining perfection for use from April till August or September, and run to seed, and totally perish the same year; but the autumn sowings in August being designed not to come in for use till October, in order that the plants may remain all winter, and the following spring, until succeeded by the spring-sown crops, as before remarked.

Observe of the spring sowing, that as the very early sowings in January run soon to seed, should sow but a moderate quantity; but may sow freely in February, March, and April, every three weeks, for the main spring crops, which will attain full perfection in useful growth, before it begins to run; and will supply plenty of young Spinach in great perfection, from April or May, till towards midsummer.

But if Spinach is required throughout the summer, continue the sowings every fortnight, all May, June, and July; though the summer-sown Spinach rarely attains full perfection, like the spring sowings, as it runs hastily up to seed; but should sow frequent accordingly; and always in a free open situation, the seed sown thin, and the plants thinned timely in their advancing young growth.

And as to the autumn sowings, as the plants do not run the same year, should always sow a good full crop to stand for winter and early spring use, as aforesaid.

With respect to the soil and situation for the culture of Spinach, it succeeds in any common soil of a kitchen-garden; but the richer in dung, the better; for a well enriched soil makes great difference in the growth of Spinach, by exhibiting the plants of a luxuriant growth, in respect to size and thick consistence of the leaves, a material excellence to be regarded in Spinach; always choosing an open situation, not too near low-spreading trees, &c. for Spinach never succeeds in close or shady places, in which it always draws up weak, and soon runs to seed, without attaining perfection; but having a free exposure open to the sun and air, encourages a stocky growth, and large expansion of its leaves. A warm border may be proper for the early crops; but for the main crops in general, the open quarters are the most eligible; though a broad warm-lying border may also be proper for some part of the later sown winter-crops occasionally, for the

the sake of having the advantage of a little shelter of the fence, and benefit of the sun during the winter season.

Let fresh seed not more than a year old be procured for each sowing; for this will be found of much importance in the free growth of the plants; and for the autumn sowings of the winter crops, it is of advantage to procure new seed of the same year's sowing, if possible.

The ground being digged, the seed may either be sown broad-cast and raked in, or in shallow drills a-foot asunder; though broad-cast is the most expeditious, and probably the most eligible method for the growth of the crop, in the product of large full leaves; sowing it all over the surface moderately thin, either in one continued plat, and trodden down evenly, if light ground, and raked in with a large rake, or light harrow; or may divide the ground into four or five-feet-wide beds, with foot-wide alleys between; more especially for the early and winter crops in wet ground; and the seeds being sown as above, rake them in evenly: but drill-sowing may also be occasionally practised, drawing the drills with an hoe flatways, near an inch deep, and ten or twelve inches asunder, scattering the seeds thinly along the drills, and rake the earth over, full half an inch deep; which mode of sowing Spinach may be more particularly eligible, when obliged to sow between other crops, as between wide rows of beans, peas, cabbages, &c. it also more readily admits of hoeing up the weeds between the rows; and if sown thin, and the plants also thinned proportionably, they will grow as large and fine as in the other method of sowing, and the produce very conveniently gathered; so that drill-sowing of Spinach, the spring-crops particularly, may also be effected occasionally, between other crops already growing in rows; as beans, cabbage, cauliflowers, &c. and may likewise be sown in wide drills alone; i. e. either about a foot distance for a distinct full crop; or in rows two feet asunder, to admit of intercropping in the intervals with rows of cabbages, beans, and other things occasionally: however, the broad-cast sowing being the most ready and expeditious for a large full crop, and generally also the most advantageous for making the most of the ground when necessary, is the most commonly adopted method of sowing Spinach, for large tracts of ground especially. See SOWING OF SEEDS.

Observe, in either of these methods of sowing Spinach, to scatter the seeds moderately thin, as the plants at any rate require to be

thinned to three or four inches distance at least; do not however spare seed in a moderate way, and let it be directly raked regularly in; previously observing of that sown broad-cast all over the surface, if in light loose land particularly, and a dry warm season in the advanced part of spring, and in summer and autumn, it may be proper first to tread the seed evenly down, then rake it in effectually with a large rake; and of that sown in drills, rake the earth evenly over it the depth aforesaid, and rake the surface smooth.

These seeds quickly germinate, and the plants will come up in a fortnight; or perhaps, if sown very early in spring, it will be three weeks or a month before they come up.

Observing, however, in respect to their culture, that when the plants have three or four leaves an inch broad, they should be thinned and cleared from weeds, performed either by hoe or hand; but the former is the most eligible, especially for the broad-cast-sown crops: chusing dry weather, and cut out the plants to three or four inches distance, together with all the weeds in every part; the above distance, however, is scarcely sufficient, unless intended to begin thinning out the plants for use while young; otherwise it is advisable to hoe them out six or eight inches asunder, especially the spring and summer crops of the round Spinach, which having proper room, will grow very large, and spread its broad leaves widely around, and will not run to seed so soon as if left close; for the spring and summer-sown Spinach in particular, if left too close, draw up weak and trifling, and soon go to seed; but as to the winter crops of triangular or prickly Spinach, if thinned finally to three or four inches distance, will be sufficient. See their *Spring, Summer, and Winter Culture*, under separate heads.

Spinach is often sown in spring with other crops, for the sake of cropping the ground to the best advantage, where necessary; especially where straitened for kitchen-ground room, or also when occasionally necessary to sow any considerable space of ground for a large crop of spring Spinach; for as the plants are of low spreading growth, soon acquiring useful perfection, and of short duration in the spring-sown crops, generally terminating their useful growth early in summer, for clearing off the ground to give full scope for any intervening succession crops; so that, agreeable to these intimations, where thought expedient, by way of saving or gaining ground, may occasionally perform some of the spring sowings, less or more, between rows of some particular crops, such as in final transplanted young cabbages
cauli.

cauliflowers, also between rows of beans, peas, &c. sowing the seed either broad-cast thinly, and raked in regularly, or in middle drills singly, or doubly between wide rows; sometimes also the market gardeners in sowing the large main crops of spring Spinach, they on the same consideration, to save or gain ground, &c. sow Spinach and short-top radishes mixed together, in February and March, &c. both on large borders and in the main quarters, often on the same ground where the general crops of spring-planted cabbages and cauliflowers are intended, generally sowing the Spinach and radishes first by broad-cast all over the ground, and rake or harrow them in; then either directly, or in a week, fortnight, or a month after, as it suits, plant the cabbages and cauliflowers in rows at proper distances, as directed under their proper heads. See BRASSICA. They will soon take root, and get the start of the Spinach and radishes, without retarding their growth; and the two latter will be all gathered off for use, by the end of May, and beginning and middle of June; when the ground is hoed to cut up weeds, loosen the soil, and draw up earth to the stems of the cauliflowers and cabbage-plants.

But the above methods of sowing Spinach with other crops are only intimated for occasional practice in the aforementioned cases; for in gardens where they are not necessitated to make the greatest advantage of the ground, it may be more advisable to sow the main crops mostly alone, without the incumbrance of other crops; in which the Spinach will most generally attain the greater perfection; in this however, every one will suit his own convenience.

When the plants have leaves two or three inches broad, may begin thinning out some for use.

As to the method of gathering Spinach for use, it may either be cut up with a knife wholly to the bottom, or clean out by the root if the crop wants thinning; or only crop the large outer leaves; the root and heart remaining, shoots out again.

In gathering the spring crops, however, we may at first, if the plants want thinning, cut them up wholly to the root, thinning them out where thickest in a gradual manner, so as to leave the standing plants at least six or eight inches distant to grow to perfection, which, when beginning to shoot for seed, may also be cut up wholly to the bottom.

And in gathering the winter crop of Spinach, if the plants stand too close at first, some may be thinned out quite to the bottom;

afterwards must only crop the larger outer leaves all winter, and early part of the spring; but when the spring is more advanced, and the plants grown large and require thinning, or when they begin to run to seed, you may then cut them up to the bottom, in a thinning order.

Having thus exhibited hints for the general culture of Spinach, we now proceed to treat of the culture of each variety separately, in its proper season; first, the spring and summer crops; second, the winter crop.

Spring and Summer Crops.

The round or smooth Spinach being the most eligible sort for the spring and summer culture, for the reasons before observed, February, March, and April are the principal months for spring-sowing the main crops thereof; though, to obtain a succession of this Spinach as early and late as possible, several sowings may be performed, from January till August, as already observed.

The first sowings may be performed in the beginning or any time of January, if the weather is open; or, for the greater chance of success, may sow twice in that month, if the weather permits, in a warm dry situation; sowing only a moderate portion at this early season, especially in the beginning of the month, as it may be cut off by inclement weather; or if the crop survives the frost, these early plants are apt to go to seed soon after they acquire their proper growth.

In February, however, for the main spring crops, may sow more freely in almost any open situation, especially towards the middle of the month; it will, however, be proper to sow also twice in this month, at two or three weeks' interval; which will ensure the greater success of plenty in a regular succession a long time, to succeed the winter crops, which will run to seed in April and May, about the time these sowings arrive to the first state of maturity for the table.

In March and April, it is also advisable to continue sowing the same sort of Spinach every three weeks, in an open situation, which will furnish a regular supply for the table or market in May and June.

And in the months of May, June, and July, if a constant succession is required all summer, it is proper to repeat the sowings almost every fortnight during those months, for these plants very soon shoot up for seed at this season: choosing for these summer-crops the moistest soil the garden affords in a free situation: and if you can have the opportunity of moist weather for sowing them, it will be a particular advantage; being careful to sow the seed moderately thin and regular, either broad-

broad-cast and raked well into the ground, or in drills and earthed in an inch deep: and let the plants be moderately thinned in proportion; otherwise will soon draw one another up into stalk for seed. Observing, that if a regular succession is required to be extended also quite through the autumn, we must continue the summer sowings till the middle or latter end of July; and thus we procure a constant succession till the beginning of winter, or till succeeded by the winter crops in October.

With respect to the method of sowing all the above spring and summer crops of Spinach, it may be principally by broad-cast and raked in, or occasionally in drills, as before observed in the *General Culture*.

But such persons as are not particularly anxious about having the Spinach in the fullest growth in large thick leaves, may sow it thick in drills, six inches to a foot or less asunder, so when the plants are up, permit the whole to stand to grow up together in close rows; and when two or three inches high, cut them off close according as wanted, leaving the bottom to shoot up again, to afford one or two more cuttings; but which will be greatly inferior in goodness of growth, to those crops in which the plants are thinned to moderate distances; however, every one may suit his own inclination and convenience, in the methods of sowing, agreeable to the foregoing intimations.

As to the culture of these spring and summer crops of Spinach, it is nearly the same as observed in the general culture; that when the plants have three or four leaves an inch broad, hoeing them out in dry weather to about three or four inches distance, cutting up all weeds; and when they are advanced in growth, so as nearly to meet, they will be fit for the table: when may either gather the large leaves, or if the plants stand close, they may be thinned out regularly, the largest for use, cutting them up close within the ground; repeating the thinnings according as they are wanted for the family or market: and those remaining at last, having full scope, will attain great perfection, in large broad spreading leaves, thick and succulent.

After, however, all these spring and summer crops attain full perfection for use, they soon shoot up stalks for seed, the same season, and become useless; which renders a repetition of several sowings necessary.

Some of the best plants of the February and March sown crops should be left to run up, and produce seed for next year's sowing. See *Sowing the Seed*.

Winter Crop.

Winter Spinach is principally the triangular or prickly sort, as being the hardiest, sown in the end of July or beginning of August, and arriving to perfection for use the same year, in the latter end of September, or in October; and stands without running all winter, supplying the table all that season, and the following spring; being, however, generally in good perfection all October, November, and December if mild weather, and often in moderate seasons continues growing all winter long; is liable however to suffer by severe frost; but the root and heart remaining sound, it recovers strength apace as the spring advances, and shoots out into large leaves abundantly till May; then it shoots for seed, being succeeded by the spring-sown crop.

It is advisable to chuse principally the triangular or prickly Spinach for this main crop, as being the hardiest to endure the frost and wet in winter. The leaves not being so succulent as those of the round-leaved Spinach, are less liable to be affected in winter, by severe cutting cold, or excessive moisture; however, some of the round-leaved sort may also be sown in a warm-lying dry situation, in which the plants often stand the winter effectually, and produce fine large leaves towards the spring.

The proper season for sowing this crop is principally the first and second week in August; for if sown sooner, it will get too forward, and be apt to run to seed the same autumn, or very early in the spring; however, in cold or poor soils, in very exposed situations, it is proper to sow early in the first week of this month, as the forwarding the sowings a few days in such soils and situation is of importance, that the crop may get properly forward and obtain sufficient strength before the approach of winter. But in good, rich, warm-lying ground, if the sowing is performed any time in the first fortnight of the month, it may be time enough; and in some of the rich grounds about London, they often sow this crop of Spinach in the middle of this month, especially for the later crop; however, it is most advisable to sow the main winter crops rather early in August, which generally proves a very successful season in most situations for sowing winter Spinach; observing, if showery weather happen about this time, it will prove an advantageous opportunity for sowing; as, when sown in dry hot weather, this seed is apt to germinate irregularly, and the plants rise sparingly and straggling; do not however omit the proper sowing season as above.

Chuse

Chuse generally for this crop an open situation, that lies tolerably dry in winter, and that enjoys the winter's sun.

And the ground being properly digged, immediately sow the seed while the surface is fresh and moist, sowing it generally by broadcast all over the surface, either in one continued plat to make the most of the ground, or in four or five-foot wide beds, for the convenience of standing in the alleys to do the necessary culture and gather the produce; and may scatter a sprinkling of brown Dutch, and common cabbage lettuce, &c. along with the Spinach seed, to take their chance for culling out in winter and spring: directly, as soon as sown, tread and rake it in evenly.

Or some may be occasionally sown in drills, eight to ten or twelve inches asunder, as formerly intimated: but I would more generally prefer the broad-cast sowing for the principal crop, either in a continued space, or in beds, as above: especially when intended to give the plants a regular thinning, which is always the most effectual mode of culture, whereby to have Spinach in best perfection.

In large crops of winter Spinach, as in most of the market gardens, they very commonly plant rows of early cabbages, in October or November, whereby to make all possible advantage of the ground; the rows of cabbage being three feet and an half or four feet asunder, or more, as, at that distance, they in their advancing growth, will not be any impediment to the Spinach, which in spring being all cleared off for use, there remains a full crop of cabbages, &c. in good forwardness; so we thus both gain time and ground.

But with respect to the culture of this crop of winter Spinach, the plants coming up in a week or fortnight after sowing, will, in three or four weeks after that, when their leaves are an inch broad, want thinning and clearing from weeds, performing it if possible by hoeing in dry weather, leaving the plants three or four inches asunder; which will be room enough for the present, as some may afterwards be gradually thinned out for use, so as to leave them finally about four or five inches apart; afterwards, must only gather the leaves for use all winter, taking always the larger outer ones; and the smaller leaves in the centre gradually expand themselves in their turn for use in regular succession all winter and spring; but in the spring, when the plants grow large and crowd one another, or begin to shoot for seed, they may be cut up clean to the root.

Particular attention is required to keep this crop clear from weeds by occasional hoeings

and hand-weeding as may be convenient, being particularly careful to clear away chick-weed, which is apt to infest this crop greatly in winter; always shaking the largest of the weeds entirely off the ground, which, if left at this moist season, would soon strike root again and grow.

Towards spring, after the rigours of winter are past, take opportunity of a fine dry mild day, and lightly hoe the surface of the ground about the Spinach, which will greatly recruit the vigour of the plants, and in February and March will shoot out strong, and attain fine perfection again for use: still cropping only the largest outer leaves at first, unless they stand too thick, or when they begin to shoot for seed, as before hinted; then may be cut up by the root, as they are wanted, leaving a portion to produce seed, as below.

Saving the Seed.

When intended to save Spinach seed, may allot a portion both of the spring and winter crops to stand and run up for that purpose.

Remarking, you may either sow a quantity of both varieties on purpose, in spring and autumn, in an open situation, to stand for seed; or may leave a parcel of some of the crops that were raised for use; observing of the spring-crops, chuse principally that of the February or beginning of March sowing, which will run up early the same year, and ripen seed the beginning of autumn following: and as to the winter crops, they being not raised till August, do not shoot till the following spring; though as they run earlier to stalk than the spring-sown plants, they probably will ripen their seeds somewhat earlier in autumn.

Note, in the plants designed for seed, it may be of some advantage to have the two varieties, round and triangular Spinach, at some distance from another, lest by the intercommunication of the farina it may cause a degeneracy.

Observe likewise, in the plants allotted for seed, should draw out all the bad sorts, preferring those of the most stocky growth, with the largest, most expanded, and thickest leaves; thinning the whole eight or ten inches distance, and cut up all weeds.

They will begin to run up to seed-stalks in April and May: the winter crops generally shoot first, and are soon followed by the spring crops, flowering in June; at which time the male and female plants discover themselves distinctly; leaving, however, the whole to nature, the males will sufficiently fecundate the flowers of the female plants, so

as the latter will be loaded with abundance of ripe fertile seeds, in the end of July or beginning of August.

When the seed is full ripe, which is obvious by its changing brown and hardening, the stalks must be pulled up, and spread to dry a few days, turning them occasionally to dry, and harden all the seed properly : then thresh them out, and bag them for use.

This newly-saved seed is excellent to sow for the winter crop, provided it is ripe time enough ; it however remains perfectly good for next year's sowing, but is not to be trusted to if more than a year old.

SPIRÆA, *Spiræa frutex*, &c.

This genus is composed of shrubby and herbaceous plants, consisting of many beautiful, deciduous, flowering shrubs, and floriferous herbaceous perennials, all of hardy temperament ; and eminent for decorating the pleasure-ground, being of upright growth, adorned with spear-shaped, pinnated, trifoliate, and decompound leaves in the different species, and terminated by spikes and clusters of pentapetalous flowers.

Class and order, *Icosandria Pentagynia*.

Characters.] CALYX is monophyllous, acutely quinque-dentate, and permanent. COROLLA, five oblong roundish petals inserted into the calyx. STAMINA, twenty or more slender filaments, having roundish antheræ. PISTILLUM, five or more germens, supporting five styles, having capitated stigmas. PERICARPIUM, oblong, acuminate, compressed, bivalvular capsules, containing a few small acuminate seeds.

There are many species of *Spiræa*, the greater part of them being shrubby, with durable stems, &c. and others are herbaceous, having durable roots, but mostly annual in stalk. All the shrubby kinds are originally exotics, from different parts of the continent of Europe, Siberia, &c. and North America ; and of the herbaceous kinds, some are indigenous plants of England, others exotics ; but all the sorts, both shrubby and herbaceous, are very hardy, and most of them have been long inhabitants in our gardens for ornamenting the shrubbery, &c.

Shrubby Kinds.

Under this head are exhibited some very eminent hardy, deciduous, flowering shrubs, obtaining from about three or four to six or eight feet stature, mostly with slender pliant shoots, some garnished with oblong simple leaves, others with lobated and pinnated foliage ; and the branches terminated by spikes and clusters of flowers of very ornamental appearance ; hence these shrubs are in good

estimation among the curious for embellishing the shrubbery compartments, particularly the first three or four species, which have been long residents of our gardens.

There being eight or nine species of these shrubby *Spiræas*, are all originally from abroad, in different parts of Europe, Asia and America, &c. but are all hardy enough to succeed in our open plantations.

The chief species are,

1. *SPIRÆA salicifolia*.

Willow-leaved Siberian Spiræa, or Common Spiræa frutex.] Rises with many upright, straight, slender, reddish-brown stems and suckers from the root, three or four feet high ; garnished with spear-shaped, obtuse, serrated, naked leaves ; and the stalks terminated at top by doubly-branching racemous spikes of numerous pale-red flowers.

This is the most common sort of *Spiræa*, is in high estimation as a flowering shrub ; it flowering beautifully in June and July ; and frequently the same year's suckers, from the root, flower also in August.

The young shoots of this plant being straight, pliant, and tough, are often used for tops of fishing rods, and riding switches.

2. *SPIRÆA tomentosa*.

Tomentose or Downy-leaved, Red Philadelphian Spiræa.] Rises with upright, slender, branchy, purplish stems, three or four feet high ; spear-shaped, unequally-sawed leaves, tomentose or downy underneath ; and the branches terminated by doubly-branching racemous spikes of beautiful red flowers.

Variety.] With white flowers.

Both the varieties flower in June and July, and are very beautiful.

3. *SPIRÆA hypericifolia*.

Hypericum-leaved Canada Spiræa, commonly called Hypericum frutex.] Rises with slender brown stems, branching numerously and slender almost from the bottom, five or six feet high ; garnished with small oval entire leaves, and numerous small white flowers all along the branches, to the very ends of the twigs, in small close-fitting umbels.

This shrub has singular beauty when in flower, as every branch and twig is closely covered with flowers their whole length ; flowering in May and June, continuing very ornamental about a fortnight.

4. *SPIRÆA opulifolia*.

Guelder-Rose-leaved Virginia Spiræa.] Rises with many shrubby stems branching six or seven feet high, having a brown loose bark, falling off in winter ; garnished with lobated or lobed leaves, like the guelder-rose and currant leaf ; and numerous white flowers in

corymbose bunches at the ends of the branches.

5. *SPIRÆA forbifolia*.

Sorbus-leaved Siberian Spiræa.] Rises with shrubby slender stems and branches, three or four feet high; pinnated leaves of four or five pair of folioles uniformly serrated; and white flowers in panicles at the ends of the branches, in July.

6. *SPIRÆA crenata*.

Crenated-leaved, Siberian and Spanish Spiræa.] Rises with shrubby slender stems, and numerous slender, brownish branches, four feet high; having oblong leaves serrated at the end, and white flowers in corymbose bunches laterally from the sides of the branches in May.

7. *SPIRÆA chamædrifolia*.

Germander-leaved Siberian Spiræa.] The leaves ovate, cut-sawed, smooth; and with peduncled flower umbels.

8. *SPIRÆA triloba*.—Three-lobed leaved Spiræa.

9. *SPIRÆA argentea*.—Silvery wedge-form-leaved Spiræa.

All these shrubby *Spiræas* flower here very ornamentally, from May till July, in different species; but rarely ripen seeds in perfection in England; they however are all easily propagated, some by suckers, and all of them also by layers and cuttings. See their *Propagation*.

Herbaceous Kind.

Consists of four floriferous perennials of the fibrous-rooted tribe, rising with herbaceous annual stalks, from one to three or four feet high, garnished with pinnated, ternate, and decompound leaves, and terminated by cymose bunches, and panicles of flowers; they are all perennial in root, but renew their stalks annually in spring, arriving to a flowering state in June and July, produce ripe seed in autumn, and the stalks soon after decay.

There being four species of these kinds, the two first grow naturally in England, in pastures, &c. and the others are foreigners, but are both very hardy.

10. *SPIRÆA Filipendula*.

Filipendula, or Drop-wort.] Hath a fibrous root hung with numerous small oval tubers, and crowned at top with a large tuft of pinnated leaves, of many reniform, sawed lobes spreading over the ground; and upright herbaceous stalks a foot or more high, terminated by cymose bunches of white flowers.

Varieties.] Common single-flowered *Filipendula* of the pastures, &c.—Double flowered of the gardens.

The single sort grows wild in England, in pastures and chalky grounds, but is also re-

tained in gardens as a flowery plant, in assemblage with the double sort, which is very ornamental.

They flower in June and July, and the seeds ripen in autumn.

The root of this plant, consisting of many thready fibres, hung with small oval knobs, it obtained the name *Filipendula*.

11. *SPIRÆA Ulmaria*.

(Ulmaria regina prati)—*Queen of the Meadow, or Common Meadow-Sweet.*] Hath a thick, fibrated, spreading root, upright, reddish stalks, three or four feet high; garnished with large pinnated leaves, of two or three pair of indented lobes, and an odd one, which is the largest of all, and lobated; and the stalks terminated by large cymose bunches of white sweet-scented flowers, in June.

Varieties.] Common single flowered of the meadows—Double-flowered of the gardens.—Variegated-leaved.

The common single sort grows wild in moist meadows in England, but is often allowed garden-culture along with the double and variegated-leaved sorts; the flowers of all the varieties being very conspicuous, and agreeably scented; but the double sort in particular makes a fine appearance: they flower in June, and the seeds ripen in autumn.

12. *SPIRÆA trifoliata*.

Trifoliate or three-leaved Virginia Meadow Sweet.] Hath a fibrated root, upright, branchy stalks a foot high; garnished with almost equally ternate or trifoliate serrated leaves; and terminated with loose panicles of white flowers in July.

13. *SPIRÆA Aruncus*.

(Aruncus)—*Greater Meadow-Sweet, or Austrian Spiræa.*] Rises with upright firm stalks, three or four feet high; garnished with supra-decompound leaves; each division consisting of three or four pair of folioles, and an odd one; and the stalks terminated by paniculated spikes of dioecious white flowers in July.

All the above species of *Spiræa*, both shrubby and herbaceous kinds, are very hardy, succeed in any common soil and situation, and are of long duration; the shrubby kinds being durable in root, stem, and branches, and deciduous in leaf; but the herbaceous kinds are durable only in root, and renew their stalks every spring; all the sorts, both shrubby and herbaceous, flower abundantly every summer; the flowers separately are small, composed universally of five small petals each, but being numerous and closely placed, are conspicuous to view; but are rarely succeeded by seed in England in the shrubby

shrubby kinds, though most of the herbaceous kinds furnish tolerable plenty in autumn.

As to the merit of all the sorts in gardening, they are all proper furniture for ornamenting the shrubbery, and other parts of the pleasure-ground occasionally.

The shrubby kinds particularly have great merit as deciduous flowering shrubs, for embellishing the principal shrubbery compartments, placing them somewhat forward, in assemblage with other shrubs of equally moderate growth; and here they will exhibit a proper variety, and flower very ornamentally every summer.

And as to the herbaceous kinds, considered as flowery plants, all the sorts, not omitting the doubles, are proper for adorning the common borders, &c. where they will flower every summer, and increase the variety.

Propagation, &c. of the Shrubby Kinds.

The method of propagating all the shrubby kinds is very easy; by suckers, by layers, and cuttings.

By Suckers.—Several of these shrubby *Spiræas* are productive of many suckers annually from the root, which being taken off in autumn, commence good plants; but the first species in particular, *Spiræa salicifolia*, *Willow-leaved Spiræa*, or *Common Spiræa fruticosa*, is remarkably prolific in suckers, that in one summer grow as high as the parent plant, and generally terminated by spikes of flowers the same year in autumn, and should always be cleared off from the old plants every year or two in winter; as should also the suckers of all the other sorts: and as most of which suckers will readily rise with roots, they immediately commence proper plants; and the largest may be planted at once where they are to remain, and the others in nursery-rows, to have one or two years' growth, and will then be fit for the shrubbery.

By Layers.—All these sorts will grow freely by layers, but is a more particularly eligible mode of propagation for any of the sorts that do not readily afford a sufficiency of suckers; for almost every branch or twig being layed down in the earth, in autumn or winter or spring, will be well rooted, fit for transplantation, by the autumn following.

By Cuttings.—Any of the shrubby sorts will likewise grow by cuttings, though not to be depended upon like layers; however, in October or November, chusing cuttings of the strongest young shoots of last summer's growth, planting them in a shady border, many of them will grow, and, in two or three years, commence good plants for the shrubbery.

Propagation, &c. of the Herbaceous Kinds.

All these sorts may be propagated by seed, and by parting the roots.

By Seed.—This may be sown either in autumn soon after it is ripe, for the greater certainty of having them come up freely in the spring following, or may be sown early in the spring, as they will also often rise the same year; keeping the plants thin, and clear from weeds till autumn, then planted out either in nursery-rows for a year, or at once where they are to remain.

By parting the roots.—All the herbaceous kinds may be propagated by this method in autumn, and is the only method of propagation for continuing the double-flowered and striped varieties; observing, of all the sorts, it may be performed either in autumn when the stalks decay, or early in spring before new ones begin to shoot forth.

SPONDIAS, Brazilian Plum.

This genus comprehends for our stove collection, two species of tree-like exotics of America and India; growing ten or twelve to fifteen or twenty feet high; adorned with winged or pinnated leaves, composed of four, five, or six pair of folioles, terminated by an odd one; and numerous small pentapetalous flowers along the sides of the branches; having each a five-parted deciduous calyx, five oblong, spreading petals, ten filaments, oval germen with five styles; succeeded by a roundish, oval, plum-shaped, pulpy fruit, containing a five-celled nut.

Class and order, *Dicandria Pentagynia*.

The species are,

1. *SPONDIAS Mombin*.

(*Mombin*)—or *Brazilian Plum*.] Rises with an upright stem, and branchy head; pinnated leaves, having the common foot-stalk compressed; and purple flowers and fruit.

2. *SPONDIAS Myrobalanus*.

(*Myrobalanus*)—or *Yellow American Plum*.] Grows upright and branchy: with pinnated leaves, having round foot-stalks; glossy shining folioles; and yellow flowers and fruit.

These trees being tender exotics from the hot-parts of South America, require a hot-house in this country; and are retained accordingly to diversify curious collections in that department, in which they form an agreeable variety; and are propagated by sowing the stones of the fruit in pots plunged in the bark-bed, and by cuttings and layers of young shoots, assisted by the same means; keeping the plants always in pots, and continued in the stove; and treated as other woody plants of the same repository.

SPROUTS.

Sprouts are small young shoots or suckers, emitted from the sides of the stem and heads of certain vegetables; being in many instances a compendium of the plant that produced them; and, when detached from the parent and planted, although then destitute of roots, they often, in the process of vegetation, emit fibres, shoot at top to mature growth, and exhibit leaves, flowers, and seed, like the parent plant.

Likewise, in some herbaceous esculents, young Sprouts are excellent eating, such as in cabbages, broccoli, &c. proving a very profitable after-crop.

But the term Sprouts is more generally applied to the lateral shoots or suckers of certain herbaceous vegetables; such particularly, as most of the *brassica* tribe, comprehending all the sorts of cabbages, favoys, coleworts, borecole, purple broccoli, &c. which, after the main head is gathered for use, the stalks remaining, shoot forth abundance of Sprouts, that often form heads like the principal one, but smaller; and, may be gathered for use as esculents, and will prove equally good, and often superior to the main head for eating. Sometimes young Sprouts of cabbages, being detached as slips, and planted, will strike root and grow.

These Sprouts, however, of the cabbage-tribe, have merit chiefly as esculents, and very little in the work of propagation.

For, although they will grow if planted while young, they are only proper to be used occasionally in particular cases; as for example, in planting cabbages for seed in any particular good sort, which having the main-head gathered early in summer for use, and the stalk having produced a quantity of good Sprouts soon after, we sometimes slip off a quantity of the best of them towards autumn, plant them in rows two feet asunder, giving occasional waterings, will grow and shoot up to seed next spring. See BRASSICA.

However, the Sprouts of all the cabbage-tribe are to be considered principally as esculents; and are admirable fine eating, generally boil exceeding green and tender; but those Sprouts produced from the forward cabbage stalks in summer and autumn, are always larger and finer than the winter and spring Sprouts, as sometimes the Sprouts produced on the stalks of the early-cut cabbages often also cabbage into tolerable little firm heads towards autumn; the sugar-loaf cabbage particularly, and other forward kinds, producing abundance of fine Sprouts in summer, which,

being gathered while young and green, are some of the most excellent culinary greens of the season; likewise forward favoys being cut early in autumn, the remaining stalks produce fine large Sprouts the same year, fit for use in the early part of winter; later crops of the same plants produce also abundance of small Sprouts in the spring; and the borecole is remarkable for its great production of Sprouts towards spring, emitted all along the small stems from the very bottom to top; also purple broccoli never fails to produce a secondary crop of excellent Sprouts furnished with little tender heads.

Thus all these cabbage and colewort tribe, that after the main-heads being arrived to perfection and gathered for use, the stalks furnish a plenteous supply of Sprouts coming in for a second crop; those produced in summer and autumn continuing long in perfection; but the spring Sprouts run smaller, and continue but a short time before they fly up for seed; they are nevertheless very acceptable and useful, at that season of the year.

Therefore, in the culture of all the above varieties of the cabbage kind, it is proper, after gathering the main-heads, to leave a quantity of the stalks of the best and forwarder crops of the respective sorts, to produce Sprouts; and if, towards autumn or winter, &c. the ground should be wanted for other crops, the stalks may be removed and trenched in by the roots in another place, not in any shady by corner as often practised, nor placed too close, as the Sprouts would prove small and trifling, and be liable to be eat up by slugs; but being placed in an open situation, in rows a foot asunder, the Sprouts will continue their growth in much greater perfection, though probably not equally so good as if the stalks had remained undisturbed.

Thus the product of Sprouts will prove a very beneficial and acceptable supply, both for usefulness and variety at table.

The stalks of cauliflowers and cauliflower-broccoli rarely produce any Sprouts; so it is needless to leave them standing.

STAMINA, the male organs of flowers.

Stamina, consisting of the filaments and antheræ, the male organs of every-flower; being the fine chives or thread-shaped parts situated in the centre of the *corolla*, in number from one to twelve, or twenty, or more, and composed of the three following parts.

1. *Filamentum*, the filament or thread-shaped part of the stamina, elevating the antheræ. See FILAMENTUM.

2. *Antheræ*, the summit of the filaments, and

and that part which contains the *pollen* or fecundating dust or farina. See *ANTHERÆ*.

3. *Pollen* or farina, the fine dust, or fecundating male sperm contained in the antheræ, and, when ripe, dispersed upon the stigma or female organ, to effect the important office of impregnation.—See *ANTHERÆ* and *FILAMENTUM*, &c.

It is observable in most flowers, that the *Stamina* and *pistillum* come together; and the antheræ and stigma ripen and become of full vigour at the same time to effect the work of fecundation.

For the *Stamina*, containing the genuine male sperm of plants in the antheræ, that without its fecundatory aid no plants would be effectually prolific, but mostly abortive; at least, if they produce seeds, they would not vegetate.

In hermaphrodite plants, the *Stamina* or male organ being placed in the same flower with the female genitals, are for the most part all of equal height, generally surrounding the *pistillum* in such situation, as the farina or male sperm, lodged in the antheræ, may readily reach the *stigmata* of the female flower to impregnate it effectually; but in some hermaphrodite flowers, the *pistillum* being shorter than the *Stamina*, the flowers, though nodding before, upon opening generally stand upright, that the powder of the antheræ may fall upon the stigma; and, after conception, probably resume their drooping or pendulous posture again; and, in other hermaphrodite flowers having the style longer than the *Stamina*, it either bends back like ram's-horns towards the antheræ, or the whole flower droops, that the antheræ may drop its dust down upon the female organ. See *HERMAPHRODITUS flos*.

In monœcious plants, the *Stamina* and *pistillum* are, in different flowers, situated apart on the same plant, as in cucumber and melon; but many sorts have the male flowers mostly placed above the female, that the farina or fertilising powder may more readily fall on the stigma of the *pistillum*; or so situated as to be easily conveyed by the air, or flying insects skipping from flower to flower, sufficiently to effect the impregnation. And in some plants, such as cucumbers, growing in hot-beds at an early season, we often perform the fecundation by art, carrying the male blossom to the female, and discharge the contents of the antheræ upon the stigma; but when the warm season is advanced to admit of the plants being fully exposed, that operation is effected by the air, gentle breezes of wind, bees, &c. conveying the prolific dust of the antheræ

to the female blossom. See *CUCUMIS* and *MONÆCIA*.

And in the diœcious plants the *Stamina* and *pistillum* are, in separate flowers, situated on different plants, species of the same genus, as in spinach, hemp, hops, &c. but so wonderfully contrived by the great Author of nature, that the male dust of the antheræ is conveyed to the female flowers by the gentle breezes of air, &c. and impregnates them. See the *Class* *DICÆCIA*, under the head *CLASSIS*. See also *SEXUS*, *PISTILLUM*, *STIGMA*, and *STYLUS*.

STANDARD Trees.

Standard-trees are to be considered as all trees with upright single stems, and stand detached without being trained to any wall, &c. or other support.

The name Standard-trees is applicable both to all sorts of fruit and forest-trees, and all other tree and shrub kinds that, having upright stems, stand detached erectly without aid of support: though the word Standard is more generally understood of such trees as grow with tall erect stems, six or eight feet high, or more, before they branch out to form the head; such as the common Standard apples, pears, and other fruit-trees in orchards and gardens, and the common forest-trees of the woods and fields; in gardening, however, we commonly distinguish three sorts of Standard trees; namely, Full Standards, Half Standards, and Dwarf Standards; fruit-trees particularly, being occasionally trained in all these ways; but forest and tall ornamental trees rarely in any other than Full Standards; though, in the shrub tribe, they are occasionally formed both into Half and Dwarf Standards, according to their natural stature of growth. See each as below.

FULL STANDARDS.

Full Standards.—These are such trees that are trained with tall, straight, clean stems, six or seven feet high or more, clear of branches, then suffered to branch out at that height all around to form a head, as in Common Standard apples, and pear-trees, forest-trees, &c.

All trees designed as Full Standards, should be trained accordingly in their minor state, by trimming off all lower laterals gradually as the stem advances in height, to encourage a clean straight growth to the proper height, and promote the aspiring of the top or leading shoot more expeditiously; suffering the leader always to remain entire, especially in all forest-trees; or, if it should happen to fork, take off the worst, and leave the straightest shoot to run up, to continue the prolongation of the stem; and having thus run them

up.

up with clean stems gradually six or seven to eight or ten feet or more, especially the deciduous kinds, then suffer them to branch out into a full head, and run in height as fast as possible; though in fruit-trees the stem is often topped at six or seven feet height, to force out a set of laterals in that part, to form a regular spreading head of but moderate height, for the greater convenience of gathering the fruit: however, for all kinds of forest-tree Standards, never reduce the top, but permit the leader to remain ever entire to run up in height; for the beauty and worth of such trees consists in their lofty stature.

But in several forest and ornamental Standards of the evergreen-tribe, the trimming their stems from laterals while young, as above, must be but sparingly practised; such as the pines, firs, cedars, and several others of the coniferous tribe, which, being all of a resinous nature, do not succeed if too close pruned; besides, when designed for ornamental plantations, the trimming up the under branches of these kinds would greatly diminish the beauty of their peculiar growth; for the disposition of the branches, in most of these sorts, covering the stem in circular rays to the very bottom, is thought additionally ornamental in their general appearance, so that in training all these sorts of trees, should only prune occasionally any lower disorderly stragglers.

Almost all sorts of fruit-trees may be trained for full Standards, except vines, though all sorts will not ripen their fruit effectually on Standards in this country; such as peaches, nectarines, apricots, and figs; on the other hand, all sorts of apples, pears, plums, and cherries, ripen their fruit freely on Standards.

All fruit-trees designed as full Standards are raised by grafting, &c. on the freest strong-shooting stocks, and trained with straight clean stems full five or six feet high, either the stock trained up to that stature, and so grafted or budded at the desired height, and the graft or bud branching out forms the head; or the stock may be grafted, &c. near the ground, and the first shoot from the graft or bud trained up for a stem to the height aforesaid; then suffered to send forth branches: observing, in either method, it is next to be considered whether you intend the tree shall form a spreading open head, or assume a more erect and aspiring growth; in the former case, if you top the leading shoot of the graft or bud at six or seven feet from the ground, it will force out lateral shoots at that height, and commence a spreading head open in the middle; suffering, however, the whole afterwards to take their own growth; and in the

second instance, that, by permitting the leading shoot to remain entire, it will aspire in height, and the whole head will assume a more upright and lofty stature; in both methods the heads will afterwards naturally branch out abundantly, and furnish themselves sufficiently with bearing wood, producing fruit, in some sorts, in two or three years from the grafting and budding, as in cherries, apples, &c. but pears in particular are sometimes four, five, or six years before they bear: generally permitting the whole to take their own growth without shortening, and but very little other pruning, except the regulating any very irregular or bad growths, as below.

It being expedient to train most of our principal hardy fruit-trees as full Standards, as that, when planted in continued rows, either in gardens or orchards, by having tall stems elevating the head considerably from the ground, it both admits the influence of the sun and air more freely to the head all around; and admits of obtaining crops of esculents, grass, &c. on the ground, under their spreading branches.

With respect to the general culture of full Standard fruit-trees, in regard to pruning, &c. very little is required after the first training, to form the stem to the proper height, and the first shoots advanced at top to give the head its first formation; they should afterwards generally be allowed to advance nearly in their natural order, except reducing any very irregular growths, &c. not shortening the general branches, but permit the whole to shoot both in length and branch laterally in their own way; and they will thus all naturally form fruit-spurs along their sides upward for bearing; remarking, however, when any very irregular growing branch occasionally occurs, it should be retrenched; also if the head is much crowded, some should be judiciously thinned out to keep the middle open, long ramblers reduced, and all suckers from the root, stem, and middle of the head, cleared away, and all dead wood; which occasional prunings may be performed any time in winter.—See the culture of different fruit-trees, as apples, pears, plums, cherries, &c. under their proper heads; also PRUNING.

But sometimes Standard fruit-trees, with four, five, or six feet stems, are also planted against walls, and trained as wall trees; this being frequently practised for high walls, as the Standards having tall stems elevating the head several feet, so as immediately to cover the upper part of the wall, whilst dwarfs and Half Standards cover the bottom and middle part; and thus may every part of the wall be fully

fully occupied at once; but the dwarf-trees being designed as the principal residents, and that after several years' growth having advanced considerably upwards, and the Standards having borne a few years, the latter have their under branches gradually reduced to make room for the dwarfs, and at last are either wholly transplanted or destroyed, leaving the dwarfs in entire possession of the wall, covering it effectually from bottom to top with their branches. See the different sorts of wall-trees, as peaches, nectarines, apricots, &c.—Also the article WALL-TREES.

And sometimes Standard wall-trees with tall stems are planted against the ends of buildings, such as some choice sorts of pears in particular; also sometimes apricots in a southerly aspect, or other fruits occasionally; and which, on particular occasions, are chosen principally with tall stems to elevate the head of branches five or six feet or more from the ground, especially in much frequented or exposed situations, that the fruit may be more out of the reach of being illegally plucked; and the trees having good space of wall above, they will spread their branches accordingly, and yield large productions of fruit in the best perfection.

HALF STANDARDS.

Half Standards.—These are trees trained with short stems only three or four feet high, then suffered to branch out at that height to form heads; being practised for many sorts of fruit-trees, sometimes both as detached Standards by way of variety; and by having low heads, the fruit is more easily gathered; and likewise are often trained with fanned spreading heads, designed as wall-trees for high walls, that, as observed of the full Standards, they may cover the middle or upper part of the wall, whilst dwarfs occupy the lower part.

As to the method of raising these Half-Standard fruit-trees, it is nearly the same as observed for the full Standards; only, they being grafted, or budded upon lower stocks, training them with upright single stems only three or four feet high, either the stocks on which they are to be grafted trained up to that height for a stem; or being grafted or budded low in the stock, and the first main shoot of the graft, &c. led up for a stem, and so top it at the aforesaid height to force out branches to form the head; suffering the head, in all those designed as detached Standards, to branch out all around, and permitted to run up to a full spread, nearly according to their natural mode of growth, except just reforming any ill-growing branch, as hereafter noticed; for

shortening the branches should be very sparingly practised, which would force out numerous useless shoots, and prevent the formation of bearing wood, especially in the apple, pear, plum, and cherry kinds.

But when Half-Standards are intended for walls, they should have the head trained in a somewhat fanned manner, to spread to the wall like a common wall-tree; and as to the after-pruning, the same is to be observed, as hinted in the general culture of the respective sorts under their proper genera, whether in detached Standards or against walls.

It may sometimes be proper to have these Half Standards so trained as to form heads of as moderate growth as possible, especially the detached Standards, when designed for small compartments; in which case they are grafted or budded upon the more dwarfish sort of stocks, as apples upon codlins, and pears upon quinces, and so of other fruits; in which the head will always shoot moderate, and never ramble wide or grow high. See STOCKS.

But although a few Half Standard fruit-trees may be eligible as detached Standards for variety, they are not so proper for any general plantation in the open quarters of the garden; because their branches coming out low may impede the growth of under-crops; may however have a range thinly planted along the boundary or division of any wide compartment, especially those worked on dwarf stocks, that they may branch more moderately in a less spreading growth; and in this order may also have a good portion of the common codlin, as being naturally a moderate shooter and plentiful bearer; and, in the whole, their heads suffered to run mostly in their natural growth, except a little occasional regulating pruning, as hinted for the Full Standards.

For walls, however, that are eight or nine feet high, it would be proper to have a sufficiency of Half Standards to plant between the dwarfs or principal residents, to cover the middle or upper half of the wall, whilst the dwarfs occupy the lower space, as remarked of the full Standards.—See WALL-TREES.

Half Standard fruit-trees of cherries, apricots, &c. are also proper to plant in forcing frames to produce early fruit. See FORCING FRAMES.

The culture of detached Half Standards, in respect to pruning, is nearly as the full Standards; that, having shot out at top to form the head, permit them to branch both in length and laterally nearly in their own way, except just pruning to order any considerable irregularity, crowding branches in the middle, long ramblers, and detaching all suckers from the

the root, stem, and head, and to cut out casual dead wood; and thus the regular branches remaining at length, will emit fruit-spurs abundantly in every part for bearing.

And as to the Half Standards against walls, they are to be pruned and managed as other wall-trees, each according to its nature, as directed under their proper heads.

Forest-trees, and the taller ornamental tree kinds, are rarely ever trained as Half Standards, but mostly always suffered to run up in height to their full stature, unless any particular sort may be required to form bushy Half Standards for some particular purpose.

Many of the shrub kind in their natural growth assume the appearance of Half Standards, though some are often branchy to the very bottom, or rise with several stems; but might readily be trained with a single clear stem, three or four feet high, and then suffered to branch out into a full head.

DWARF STANDARDS.

Dwarf Standards.—They are trained with low stems only one or two feet high, being then topped to force out branches at that height to form the head.

Sometimes several sorts of choice fruit-trees are trained as Dwarf Standards, with stems seldom more than one foot high, branching out at that height, forming proportionably low heads; being occasionally planted round the borders of the kitchen or pleasure garden, &c. instead of espaliers, and the heads either kept down low by close pruning, whereby they never produce much fruit; or suffered to branch upward nearly in their natural growth, and they will bear in much greater abundance; all of which Dwarf Standards being raised by grafting, &c. upon the most dwarfish stocks, such as apples on codlin, or paradise-stocks, and pears on quinces, &c. in order to dwarf them as much as possible in their growth (see STOCKS); and as they shoot in height, each year's shoots are either generally pruned short, whereby to keep the head down, and confine it within a small compass; but, by this severe pruning, they are forced into numerous useless shoots annually, and seldom form a sufficiency of bearing wood; so that they never answer the end effectually; or the general branches permitted mostly to shoot in length, except just reducing casual ramblers, and disorderly growers; and they will generally shoot more moderately, and sooner form themselves into plentiful bearers in greater perfection; though these kinds of Dwarf Standards are not so generally introduced now since espalier fruit-trees have been brought to a proper degree of perfection in training and bearing.

However, for the sake of variety and curiosity, a few Dwarf Standards of all sorts of fruit-trees might be admitted, one here and there; and by a judicious moderate pruning, according to their nature, as directed for the respective sorts, under their proper heads, and the article DWARF TREES, they will bear abundantly in proportion to their size.

Likewise may have some Dwarf Standard fruit-trees in pots, for the purpose of forcing in hot-houses, forcing-frames, hot-beds, &c. particularly early May and May-duke cherries, plums, peaches, nectarines, apricots, figs, vines, gooseberries, currants, &c. which being placed in the above departments at the proper season, i. e. January or early in February, they will often ripen a few fruit very early in tolerable perfection, some of which might be brought to table growing on the trees in the pots. But Dwarf Standard fruit are also proper to plant fully in the borders in forcing-frames. See FORCING FRAME.

For the particular method of raising and training the different sorts of these Dwarf Standards, see DWARF TREES.

Numbers of the upright shrub tribe naturally form themselves of the Dwarf Standard kind, as rising with low, erect, firm stems, perhaps but half a foot, or a foot or two high, branching out near the ground into bushy heads, such as the gooseberry, currant, and numerous flowering shrubs and evergreens; though great numbers of the shrub kind are apt to rise with several stems immediately from or near the root, forming a bushy growth quite from the bottom; which, in many cases in the shrubbery way, may be allowable: in others, it may be proper to train them with one stem; which is easily effected by retrenching the superfluities and trimming away low stragglers; forming a clear single stem half a foot, or a foot or two high, according to their nature, then suffered to branch out into a full head.

For many of the low Standard flowering shrubs and evergreens appear to the best advantage, when trained as Standards to a single stem a foot or two high, terminated by a branchy full head.

Likewise all the fructiferous shrubs, such as all the varieties of currants and gooseberries, should generally be trained with a single stem a foot or more high, then permitted to branch out at that height into a regular head, keeping the internal part always tolerably open, and the branches moderately thin; and shorten them but sparingly, particularly the gooseberry.—See RIBES.

STAPELIA. (Stapelia.)

For

For the stove this genus furnishes two or three species of curious succulent perennial plants, singular in their protuberant branches, being mostly destitute of leaves; are of spreading and upright growth, in different species; producing large, monopetalous, stellated, variegated, yellow and purple flowers of singularly-curious appearance.

Class and order, *Pentandria Digynia*.

Characters.] CALYX, monophyllous, small, five-parted and persistent. COROLLA, monopetalous, large, flat, cut halfway into five acute segments, and containing a starry, five-pointed nectarium, with its lacerated points surrounding the parts of generation. STAMINA, five plane, broad, erect filaments, with linear antheræ attached to their sides. PISTILLUM, two oval, plane germens, without styles, each having an obtuse stigma. PERICARPIUM, two oblong, subulated, cylindric, single-celled, univalvular pods, filled with compressed downy seeds.

The species are,

1. *STAPELIA variegata*.

Variegated Lesser Stapelia, or Fritillaria Crassa Minor.] Grows with many spreading succulent branches, having several denticulated, spreading protuberances on their sides, rising about six inches; no leaves; and from the sides of the branches arise the large, spreading and starry, yellow flowers, variegated and spotted with purple, having in the centre the five-pointed coloured nectarium, including and surrounding the fructifications.

2. *STAPELIA hirsuta*.

Hairy greater Stapelia, or Fritillaria crassa major.] Grows with upright succulent, angulated branches, with erect, denticulated tubercles; and at the sides of the branches large stellated hairy flowers, variegated with purple stripes, running across the petal.

3. *STAPELIA mamillaris*.—Mamillary or Warty Stapelia.

These are plants of curious singularity, both in their leafless, protuberant and warty, succulent branches, and in the beauty of their large, stellated, variegated, spotted, and striped flowers, produced, in successional order, great part of summer and autumn, but which are of a very fetid scent.

They being tender succulent exotics, must always be kept in pots of light poor earth, and placed in the stove upon the shelves or top of the flues, &c. and continued constantly in that department, in which give them but very little water in the winter, and moderately in summer; managing them, in respect to other culture, in common with other hot-house exotics.

All the sorts are easily propagated by cuttings or slips of their succulent branches in summer; laying the cuttings or slips for a few days in the sun to heal over the moist wound occasioned on the separation from the parent plant; then plant them in pots of dry light earth, and plunge them in the tan-bed, where they will soon strike root and grow.

STAPHYLÆA. Bladder nut.

Two hardy deciduous flowering shrubs are the principal species in this genus, both of which are proper furniture for the shrubbery, being of largish upright growth, generally obtaining eight or ten feet stature, adorned with pinnated and ternate, five and three-lobed leaves; and long slender bunches of pentapetalous flowers, succeeded by bladder-like capsules; whence the name Bladder-nut.

Class and order, *Pentandria Trigynia*.

Characters.] CALYX is roundish, concave, coloured, and almost as large as the corolla. COROLLA, five oblong erect petals, nearly like the calyx, and a pitcher-shaped nectarium at the bottom. STAMINA, five oblong erect filaments, crowned with simple antheræ. PISTILLUM, a thick three-parted germen, and three styles, having obtuse stigmas. PERICARPIUM, three inflated bladder-shaped capsules, joined together by a longitudinal suture or seam, having acuminate tops, and open inwardly, inclosing two almost globular, hard, nut-like seeds.

There are only two species, both very hardy deciduous shrubs, the first of which is a native of England and other parts of Europe, the other is from America; are distinguished by the names of five-leaved and three-leaved Bladder-nut.

The species are,

1. *STAPHYLÆA pinnata*.

Pinnated five-lobed European Bladder-nut.] Rises with upright, shrubby, smooth, brownish stems, branching eight or ten feet high or more, with very pithy shoots; garnished with pinnated leaves of two pair of large, oblong, oval lobes, and an odd one; and at the axillas along the sides of the branches, long pendulous bunches of white flowers, succeeded by large, inflated, or swollen, bladder-shaped capsules, containing roundish hard seeds or nuts, ripening in autumn.

This sort grows wild in England, and many other parts of Europe, and is cultivated in gardens, to increase the variety in ornamental plantations, where it flowers and ripens seed annually.

The seeds or nuts are in some countries eaten, but have a very unpalatable relish.

2. *STAPHYLÆA trifoliata*.

Three-leaved Virginia Bladder-nut.] Rises with upright, shrubby, smooth, greyish stems, branching eight or ten feet high; garnished with ternate or trifoliate leaves, being composed each of three large oval lobes; and at the sides of the branches, long, hanging bunches of white flowers, succeeded by large inflated capsules, containing roundish hard seeds, ripe in autumn.

Both the species flower annually in May, numerous in pendulous bunches, each flower having five oblong petals; and the seeds ripen in autumn, proper to sow for propagation.

These shrubs are very eligible furniture for diversifying any of the hardy ornamental deciduous plantations, but particularly the larger shrubbery compartments, where, being planted in assemblage with other shrubs, principally of the deciduous tribe, they will agreeably multiply the variety with their pentaphyllous and ternate foliage, long pendulous bunches of flowers, and bladder-shaped capsules, which have a singular appearance in autumn.

Method of Propagation.

The propagation of both these shrubs is most easily accomplished by three or four different methods, viz. by seed, suckers, layers, and cuttings.

By Seed.—This ripens plentifully in autumn, when it should be sown soon after it is ripe, in a bed or border of any common earth, either in drills or promiscuously on the surface, covering them an inch deep; and being thus sown early in autumn, they will come up the following spring, though probably not all of them till that time twelvemonth; keeping them clean from weeds; and if, in the early part of summer, very dry weather prevails, refresh them with frequent waterings, repeating those operations during summer as occasion may require; and by autumn or spring following, the largest plants will be fit to plant out in nursery-rows; or at least in the second autumn they may be wholly planted out, placing them in rows two feet asunder, and one foot distance in each row; here to have two or three years' growth, or till wanted for the shrubbery, &c.

By Suckers.—The plants of a few years' standing generally send up suckers from the bottom in tolerable plenty, which may be easily taken up in autumn, winter, or spring, with roots, and planted in nursery-lines, to have one or two years' growth, then transplanted into the shrubbery, when required.

By Layers.—In autumn or winter choosing the younger branches, lay them either by slit or twist-laying (see *LAYERS*), and they will be

properly rooted by the following autumn; when they should be planted off in nursery-rows for a year or two, to gain due strength for the shrubbery.

By Cuttings.—In October or November procure a quantity of young shoots of the former summer's growth, choosing principally the lower part of the shoots; plant them in a shady border, giving occasional waterings the following spring and summer in dry weather, and they will be mostly well rooted by the following autumn.

STATICE, Thrift or Sea Pink, and Sea Lavender.

Consists of low, hardy, herbaceous, and under-shrubby plants for ornament and variety; some of which being flowery perennials are employed in the decoration of the pleasure ground; they rising, some sorts with very low, close, tufty heads, of numerous small, narrow, grassy, evergreen leaves close to the earth, and very slender single flower-stalks but half a foot, or a little more or less high; others having much larger, broad, radical leaves, and stronger stalks dividing into branches; all the stalks and branches of the sorts in general terminated with globular and spiked aggregate heads, of numerous small, infundibuliform; pentapetalous flowers.

Class and order, *Pentandria Pentagynia*.

Characters.] *CALYX*, an aggregate of florets collected into globular or spiked heads, included wholly in one common cup of divers structures in the different species, each floret having also its proper calyx, which is monophyllous and funnel-shaped. *COROLLA* is funnel-shaped, consisting of five small petals, narrow at the base, but broad, obtuse, and spreading above. *STAMINA*, five subulate filaments that adhere to the unguis or claws of the petals, and incumbent antheræ. *PISTILLUM*, a small germen, and five filiform distant styles, crowned with acute stigmas. *PERICARPIMUM*, none; the seeds, one in each floret, are lodged in the general calyx, each seed coronated by its own proper cup.

Since to this genus has been added the *Limonium* or Sea Lavender, the species are multiplied considerably; the first of which is the common Thrift or Sea Pink, a small, hardy, herbaceous evergreen, well known for its use occasionally as an edging to borders, &c. comprehends several varieties, all very low, close-growing, grassy-leaved plants: the other species, being mostly of the Sea Lavender kinds, are of larger growth, with broadish leaves; and consist of herbaceous and under-shrubby perennials and annuals; but for general garden culture, one species, common Thrift,

Thrift, and varieties, are very commonly cultivated: and also some of the most material of the Sea Lavender kinds are introduced for variety.

Common Thrift Kinds.

One species only comes under this head, comprising, however, several varieties; some of which were formerly considered as distinct species, but prove all varieties only of *Statice Armeria*, or common Thrift, differing somewhat in their size and colour of the flowers, as noticed below.

1. *STATICE Armeria.*

Armeria, Common Thrift or Sea Pink.] Hath a thick, fibrated, spreading, perennial root, dividing into heads at top, closely crowned with thick tufty heads of numerous linear, grassy, evergreen leaves close to the ground; and among them numerous slender single stalks, from five or six to eight or ten inches or more in the different varieties; each crowned with a globular aggregate of small red and other coloured flowers in the varieties, appearing in June and July.

Varieties.] Common smaller Thrift with pale-red flowers—With scarlet flowers, and with white flowers—Greater Thrift with red flowers—Greater Thrift with white flowers—Least Sea Pink with small flesh-coloured flowers—all of which flower profusely from the end of May until July or August.

Remarking, as to the difference in size and growth of these varieties,—the common smaller Thrift is distinguished by its leaves being more narrow, grassy, and of lower growth, and the flower-stalks only five or six inches high, being the sort most commonly used for edgings; the greater Thrift having longer and broader leaves, and flower-stalks near a foot high; and the least Thrift have exceeding narrow, short leaves, flower-stalks only three or four inches high, and very small heads of flowers.

All the sorts are inhabitants of plains and meadows, chiefly near the sea in most countries of Europe and North America; but have been long admitted into gardens as flowery plants, and are in great estimation to plant for edgings to beds and borders, as being of very low close growth, and always green; and also to plant in tufts about the flower-borders and other compartments of the pleasure ground, as they succeed in any soil and situation, and flower very abundantly in June and July, making a good ornamental appearance, more particularly the red and scarlet sorts; and for all of which purposes they are very expeditiously raised by slipping the heads and roots together, at almost any season, but

principally in autumn and spring.—See their *Propagation.*

However, for edgings in particular is the principal merit of these plants; and as they grow very close, low, and continue in verdure all the year, they form the most useful and eligible edging, next to box; and in some particular situations in gardens, are sometimes preferred to box edgings, especially as they flower very ornamentally for two months in summer; but are not however so proper for general edgings as box, as being rather apt to spread soon out of bounds, and require to be reduced, either by cutting them inconsiderably on each side, or by taking up and re-planting them afresh every three or four years.—See *EDGINGS.*

Sea Lavender Kinds, &c.

These sorts assume a different appearance from the common Thrift kinds, both in their foliage and mode of flowering; their leaves not being so small and grassy, but mostly plane and broadish, and the stalks generally dividing into panicles terminated by the flowers, not in globular heads like the Thrift, but chiefly in spiked aggregates; but their general *characters* proving the same as in the Thrift, they are all considered as true species of *Statice*.

2. *STATICE Limonium.*

(Limonium) — or common Sea Lavender.]

Hath thick, reddish, fibrated roots, crowned with oval-spear-shaped, smooth leaves; and upright, firm, cylindric stalks a foot or more high, dividing into paniculated branches, all terminated by spiked heads of pale-blue flowers, in July and August.

Varieties.]—Common great Sea Lavender—Narbonne great late-flowering Sea Lavender—Olive-leaved Sea Lavender—Deep blue-flowered Sea Lavender—White-flowered Sea Lavender.

This species grows naturally on the sea-shores of England, &c. and is sometimes retained in the gardens for variety.

3. *STATICE tatarica.*

Tartarian Sea Lavender.] Hath long, spear-shaped, sharp-pointed leaves; and forked, branchy, spreading stalks six or eight inches high, terminated by spiked heads of whitish alternate flowers at a distance, in August and September.

4. *STATICE reticulata.*

Netted Sea Lavender.] Hath cuneiform or wedge-shaped lower leaves; prostrate slender stalks, and retroflexed naked sterile branches netted or matted together; and the stalks terminated by panicles of pale-blue flowers, in July and August.

This is a sea-side plant of England, and most parts of Europe.

5. *STATICE cordata*.

Heart-leaved Mediterranean Sea Lavender.] Hath thick, spatulate, heart-shaped, retuse, smooth leaves close to the ground; and slender naked stalks six inches high, terminating in panicles of pale-red flowers, in August.

6. *STATICE flexuosa*.

Flexuose Siberian Sea Lavender.] — Hath oval nervous leaves from the roots; and weak, flexuose, branchy stalks eight or ten inches long, terminated by corymbose bunches of flowers, in August and September.

7. *STATICE speciosa*.

Specious-flowered Sea Lavender.] With ovate, dagger-pointed leaves; flower-stalks two-edged, two forking, terminated by aggregate heads of flowers.

8. *STATICE suffruticosa*.

Under-shrubby Siberian Sea Lavender.] Hath under-shrubby stalks, naked and branching near the top, rising near two feet high; spear-shaped variegated leaves; and close-fitting round heads of pale-blue or whitish flowers, in August and September.

9. *STATICE monopetala*.

Monopetalous Sicilian Sea Pink.] Hath under-shrubby, leafy stalks, spear-shaped, vaginant leaves; and flowers placed singly.

10. *STATICE ferulacea*.

Ferula-leaved Barbary Sea Pink.] Under-shrubby branching stalk, the branchlets chaffy and imbricated, terminated by hairy bristles.

All these species, both of the Thrift and Sea Lavender kinds, are hardy fibrous-rooted perennials, seven of them being herbaceous, and the others under-shrubby; all of which flower abundantly in summer; the flowers are numerous, but separately small, funnel-shaped, and pentapetalous; and many collected together into aggregates, within one general cup (see the *Characters*); being generally produced at the ends of the stalks and branches, in some singly, in others in panicles, as before described in each species; but are not all commonly succeeded by seeds in the gardens.

But of the above species, the last three or four sorts being rather tenderer than the others, some of each should generally be kept in pots, and placed among the green-house plants, to have protection in winter.

The first species, *Statice Armeria*, and varieties, being considerably the most material for their use as edgings, are the most generally cultivated.

The other species are not so generally common in the gardens; however, all the sorts of them that can be obtained, may with propriety

be admitted, to increase the variety, as they take up but little room, will grow in almost any common soil and situation, though, if but moderately exposed to the sun, they will probably be the more successful and durable.

All the sorts, both the Thrift and other kinds, may be planted any time in autumn or spring.

The Thrift kinds, as we before noticed, are proper both to form edgings, and to plant in detached tufts about the borders: the scarlet Thrift is the most beautiful in regard to its flowering; but, for variety, should also admit the pale-red and white kinds, all of which succeed almost any where, and may be planted at almost any season when not in flower; though the autumn and spring are the most successful seasons for planting them.

As to the method of planting Thrift edgings, a quantity of slips being obtained in the seasons above-mentioned from old plants, by slipping or dividing the off sets of their roots, not however too small, and each slip furnished with roots and top; then, having made up the edge of the bed or border even and firm, proceed to plant them either with a dibble in one range, two or three inches distance in the row; or to form at once a close edging, may plant them so near as to touch one another; or, otherwise, to perform this more effectually, may form a small trench, as in planting box edgings; so plant the Thrift in the trench quite close together, to form immediately a compact uniform edging, in the manner of a box-edging aforesaid. See *Buxus Suffruticosus*, and *EDGINGS*.

And as to the culture of these edgings, they should every summer, immediately after flowering, be trimmed with garden-shears or knife, to cut off all the decayed flower-stalks close to the bottom; likewise, to trim in any projecting irregularity of the edging at sides or top: also when it spreads considerably out of bounds, should be cut in evenly on each side, in due proportion; observing to perform those occasional trimmings generally in moist weather, and not too late in autumn, otherwise the drought of summer, or the cold in winter, may injure it when newly cut, and cause it to assume a shabby disagreeable appearance.

Observe, however, that when these edgings grow considerably out of bounds, or become very irregular, it is proper to take them up, slip the plants small, and immediately replant them again as before, in a neat regular edging.

Sometimes these edgings require replanting, as above, every three or four years.

Method

Method of propagating all the Species.

All the sorts are very easily propagated, by slipping or parting the roots, in autumn and spring.

Thrift kinds.—All the varieties of Thrift propagate abundantly by off-sets of the root and head; which, in early autumn, or in the spring, &c. may either be slipped off from any growing plants, or any large old plants taken up and wholly divided, each into as many separate slips as it admits; preserving the root and top to each slip; and plant them directly, either in an edging, or in the borders, &c.

Sea Lavender kinds.—They may be propagated by parting their roots, in autumn or spring: also some of them by slips or cuttings of their shoots in summer, planted in a shady border, or shaded and watered; and they will be rooted by autumn.

These sorts may also be raised from seeds when they can be obtained from the places where they ripen, in England and abroad; sowing the hardy sorts in autumn, or early in spring on an east border, and in warm dry weather give frequent waterings, both before and after the plants come up; and in summer or autumn, plant them out in beds or borders; and the tenderer kinds, sow in March or April, either in a warm border, or in pots under glasses, or forwarded in a hot-bed; and when the plants are a little advanced in growth, transplant them as above; and some in pots to move under shelter in winter.

STELLATA Planta, a Starry Plant.

Such as have the leaves disposed in rays or whorls round the stem at intervals, and point different ways like the figure of a radiant star; exemplified in *Rubia*, or madder, &c. likewise such as have the petals of the flower starry radiated.

STEWARTIA, *Stewartia*.

There is but one species, a hardy deciduous flowering shrub from North America, proper for the shrubbery compartments, rising several feet high, adorned with largish simple leaves, and large pentapetalous flowers.

Class and order, *Monadelphica Polyandria*.

Characters.] CALYX is monophyllous, divided into five oval, spreading segments, and permanent. COROLLA, five large, oval, spreading petals. STAMINA, many filiform monadelphous filaments, being united into a cylinder at bottom, connected to the petals at their base, and crowned with roundish incumbent antheræ. PISTILLUM, a roundish hairy germen, five slender styles, having obtuse stigmas. PERICARPIUM, a quinquelobate pomaceous capsule of five cells, each having an oval compressed seed.

STEWARTIA *Malacodendron*.

Stewartia or *Malacodendron*.] Rises with a shrubby stem branching irregularly on every side, eight or ten feet high, having the branches covered with a brownish bark; oval-spear-shaped, sawed, veined, alternate leaves, two or three inches long, and half as broad; and at the sides of the branches large white flowers, having numerous purple stamina surrounding the five styles; flowering early in June, but do not perfect seeds in England.

This elegant shrub is a native of Virginia, from which country it was introduced into our gardens to increase the variety in the shrubbery collection; and is raised in most of the nurseries for sale.

It is a hardy shrub, though young seedling plants of it are rather a little tender the first year or two, requiring shelter from frost, but after having acquired more strength, will stand very well in the open shrubbery the year round.

It is propagated by seed and by layers, and sometimes by cuttings.

By Seed.—This the seedsmen procure annually from abroad; sow it as soon as possible either in an easterly border of light earth, about half or near an inch deep; giving water in summer, and shelter from frost in winter; or, where convenient, it would be of great advantage to sow them in pots, and plunge them in a hot-bed, either of dung or bark, under glasses, giving occasional waterings, and moderate shade from the sun, both before and after the plants come up; being careful to harden them gradually in due time to the open air in summer; but in winter place them under a garden-frame, to remain till spring; when, in order to forward them as much as possible, may plunge them again in a bark-bed for a month or two, till towards summer, then gradually hardened, and plunged in a shady border till autumn, at which time removed again under shelter all winter; and in March following, may pot them off separately into small pots, which if plunged also in a bark-bed, it will strike them more expeditiously, bestowing proper waterings and occasional shade; not forgetting to harden them as before, and protect them with shelter another winter; and in spring following, when the weather is settled, may venture to turn them out, with the balls of earth about their roots, into the full ground.

By Layers.—Chuse the young shoots for laying, which may be performed early in autumn, generally by slit-laying; and in the following spring and summer in dry weather, do not fail to give frequent waterings; and if screened with a moderate shade in the heat of summer,

summer, they will root more freely, which they sometimes effect in one year; when, in March, pot them off separately; and if then plunged in any moderate heat for a few weeks, it will forward them considerably; removing them to a shady border all summer, to shelter of a frame in winter; and in spring after, transplant them with balls into the open ground, finally to remain.

By Cuttings.—Young shoots in spring and summer being planted in pots of good earth, and plunged in a bark-bed, some of them will probably strike and commence proper plants, which must be timely inured to the open air, and managed as the seedlings and layers.

STIGMA of the flower.

Is the extremity or summit of the pistillum, or female organ of flowers.

The Stigma forms the head or summit of the style, and is accounted the principal female organ of plants, designed for the reception of the farina or fecundatory dust of the antheræ or male organs, which being discharged upon the moist Stigma, the particles burst, and shed their fertilising seminal virtue; and being absorbed by the Stigma, its effluvia or essence is transmitted through the style or vagina, into the heart of the germen, ovary, or seed-bud, for the purpose of impregnating the seeds.—See PISTILLUM, FILAMENTUM, and STYLUS.

As to figure, the Stigma is various in different plants; it being in some formed into a round or globular head; in others, it is either oval, orbicular, angular, crown-shaped, target-shaped, cross-shaped, stump-shaped, hook-shaped, petal-shaped (as in *Iris*), obtuse, depressed, concave, channeled, ribbed, streaked, feathered, hairy, downy, &c.

In respect to number, the Stigma is either single or but one, as in the generality of flowers; bifid or two, as in lilac; three, as in *caragana*; four, as in *epilobium* or French willow-herb; five, as in some plants.

With regard to situation, the Stigma generally terminates or crowns the style, as in most plants; sometimes when there are many Stigmata, they are disposed with admirable symmetry along the sides of the style; and when the style is wanting, as in poppy and some other flowers, the Stigma rests immediately on the germen or seed-bud.

In general, the surface of the Stigma is covered with a viscous or clammy moisture, serving to attract, retain, and dissolve the particles of the fecundating powder, and thereby more easily transmit its effluvia to the seeds below.

For, in the vegetable kingdom, the genital

dust of the antheræ being carried by the air to the moist Stigmata, where the particles burst, as before observed, and discharge their exceeding fine or subtle contents, and impregnate the ovary; as is often obvious to sight in many plants when in flower, and the farina flying about, that part thereof lights upon and clings to the Stigma; which some flowers shew in a most agreeable manner, such as in the pansies, in which, when the flower is scarcely opened, we shall see the Stigma like a concave globe gaping open on one side, and of a pure white colour; but, as soon as the antheræ of the five stamina have discharged their male dust, you may observe the whole Stigma filled with this dust, or fertilising powder, and covered all over with a yellowish-brown colour.

With respect to duration, the Stigma most commonly withers after the impregnation is effected, except in some few genera, such as poppy and water-lily, &c. in which the Stigmata is permanent or abiding.

STIPULA of the leaves, &c.

Is a scale or very small leaf on each side the base of the foot-stalk of some leaves and flowers.

The Stipula is defined to be one of the *fulcra* or props of plants, designed to support more firmly the bud of the leaves, &c. at their first appearance; being generally stationed one on each side; though some plants have only one, and a great many none at all.

Stipulæ are, however, common to a great number of plants, both trees and herbaceous vegetables; their situation is mostly on the outside of the leaves, and in some few plants on the inside: being of divers figures and sizes in different species; and in some plants they grow free, loose, and detached; in others, they grow close to the leaves, &c. in some plants they are deciduous, or fall off before the leaves; others are permanent, continuing till the general fall of the leaf.

Thus the Stipulæ often afford marks of distinction in discriminating the species; as, from their situation, number, size, duration, &c. on the particular species, their difference is frequently more essentially distinguished.

The Stipulæ are in many plants very distinguishable and conspicuous, such as in rose, apricot, peach, cassia, tamarind tree, tulip-tree, bird-cherry, and all the papilionaceous or leguminous plants, and many others.

STOCKS, for Grafting and Budding.

Stocks, when alluding to the operation of grafting and budding, are young trees raised from seed, suckers, layers, and cuttings occasionally, designedly for the reception of grafts

grafts and buds of other trees, of any select or approved sort, to propagate and continue them the same without variation, by their uniting with the said young trees or Stocks, shoot out into branches, and become trees in all respects like the approved parent trees from which they were taken; and they thus remain supported and nourished by the trees on which they are grafted, commonly termed Stocks.

For, as numerous trees, particularly the varieties of certain species, not continuing the same from seed, but often vary exceedingly to very different sorts,—in order to continue them of the same approved varieties with certainty, recourse is had to propagating them by the operation of grafting or budding, being the insertion of shoots or buds of the said approved kinds of trees into the Stock or stem, or even the branches of other trees, which, when intended for the purpose of grafting, &c. are always denominated Stocks, and should generally be species or varieties of the same genus as the trees with which they are to be grafted, or very nearly allied in their general *characters*, otherwise they will not grow kindly upon one another: but the Stocks and grafts being of the same family, and the grafting and budding properly executed, the grafts, &c. unite firmly with the Stock, shoot and branch out into full heads, commencing trees in every respect like the select kinds from which the grafts and buds were cut, producing shoots, leaves, flowers, fruit, and seed, exactly the same as the said parent trees, whether fruit-trees, forest-trees, shrubs, &c. always retaining their respective properties distinct from the Stock; the Stock also continuing its inferior quality distinct from the graft, not interfering with the nature or quality of the trees grafted thereon; only supporting or nourishing them as effectually as if upon their own roots; sometimes, however, particular sorts of Stocks affect some varieties of trees, so far as to render them of longer or shorter duration; also, in some sorts of trees, improve or diminish the quality of the fruit: so that it is of consequence to be acquainted with the proper Stocks on which to graft or bud the different trees for general service, not only the trees of different genera, but also those of particular species, and varieties of each respective genus, as hinted hereafter in the general list of Stocks.

So that all trees, whether young or old, designed for grafting or budding upon, from the size of a large goose's quill, to one, two, or three inches in diameter, are distinguished by the appellation of Stocks; because the graft or bud is inserted into the stock or stem, sometimes occasionally into the branches.

when intended to renew any old fruit-tree, or change the sort of fruit, or have two, three, or more sorts of flowers, fruit, &c. on the same tree; in all of which cases, the part receiving the graft or bud is styled the Stock.

Remarking, that Stocks for general use may be used as such either for grafting or budding, when from the size of a good large goose-quill, to half an inch, or not more than an inch thick, in the part where the graft, &c. is to be inserted; likewise, on some occasions, Stocks of two or three inches diameter, either the stems or branches, are also occasionally grafted or budded with success, not proper, however, for general practice; for the small young Stocks, of from two to three or four years' growth in the nursery, &c. and from about near half an inch to an inch thick, or but a little more or less in the part to be grafted, whether dwarf or standards, are generally the most successful for general grafting or budding in the nursery plantations, to raise any considerable quantity of trees for transplantation, either for private or public supply.

Observing likewise, Stocks for grafting and budding are employed both principally for most kinds of fruit-trees, and occasionally for some varieties of forest and ornamental trees, and many of the shrub kind, as is generally intimated in the culture of the respective sorts in their proper genera.

Remark also, that Stocks, almost in general, when intended for grafting and budding, should be species or varieties of the same genus as the trees with which they are to be ingrafted; for most of the tree and shrub kind, whether fruit-trees, forest-trees, &c. succeed principally upon Stocks of their own family only, or such that are very near kindred by the *characters* of their flowers; such as in some similar cases as follow; for example, the peach, nectarine, and almond, being all of the genus *Amygdalus*, will take upon one another, and on Stocks of the *prunus* or plum, generally succeeding best upon that kind of Stock; that though of two distinct genera, are all icosandrious plants of the drupaceous stone-fruited tribe, nearly allied in their general *characters*; the same is also observable of the pear, which will take upon some species of the *Mespilus* and *Sorbus*, also on some of the species of *Crataegus*, such as white-thorn or haw-thorn Stocks; and all of those upon one another: but neither of these, nor the pear, however, are equally successful as upon Stocks of their own family; and even all the species of the same family do not succeed equally well upon one another, some sorts requiring Stocks principally of their own species, others those of some particular species or variety in the same genus.

For

For it being also remarkable, that although all the species of any particular genus grow by grafting or budding upon Stocks of one another, yet most sorts succeed best upon their own Stocks, that is, Stocks of some varieties and the same species; except in a few instances; for example, the apple, pear, and quince, being three distinct species all of the genus *Pyrus*, and will take upon Stocks of one another as above observed, but improper for general practice, as the apple always succeeds best upon its own species, i. e. any kind of apple or crab Stocks raised from the kernels of the fruit; the pear upon pear Stocks raised in the same manner, and will succeed upon quince Stocks, when intended occasionally to form dwarf-trees; and the quince grows free enough on their own, or pear Stocks; again, the plum, cherry, and apricot, being all species of the genus *Prunus*, and the grafts and buds of all three species will grow upon Stocks of one another, yet not all equally prosperous; for the cherry is always the most thriving upon cherry Stocks, and plums and apricots best upon plum Stocks.

And in several instances some sorts are the most thriving on some particular variety of their respective favourite Stocks, exemplified in the peach and nectarine, which being generally more thriving and durable on plum Stocks than their own, yet on one particular variety of plum, namely the muscle-plum-Stock, they are generally the most prosperous in a moderate and fruitful growth; the same is also observed of some other trees, both fruit and forest-tree kinds, as hereafter hinted in the list of Stocks.

Likewise, some sorts of fruit-trees are prosperous on crab Stocks, others succeed well only on free Stocks, and some require dwarf Stocks, to dwarf them more or less, either for walls, espaliers, or forcing-frames, &c. See Crab Stocks, Free Stocks, &c. below described.

Of the different Kinds.

For the various kinds of Stocks may for distinction sake, be divided into three classes, agreeable to their different natures, viz. Crab Stocks, Free Stocks, and Dwarf Stocks; each of which comprehending various sorts, both of the same and different genera, species, and varieties; and those of each class, although they may prove species or varieties of the same genus, yet often assume different properties requisite to be known previous to their being grafted or budded, as described below, each under its own head.

Crab Stocks.—The sort of Stocks generally considered as crabs, are all such that are raised

from seeds, &c. both of any natural or ungrafted trees, particularly of the fruit-tree kind; such as the crab-apple of the woods and hedges, any kind of wild thorny uncultivated pears, plums, wild black and red cherry, &c. and also of such trees as have been grafted or budded; and, as to the merit of these wild Crab Stocks, some sorts being strong shooters and hardy, are preferred, on which to graft some particular species, as supposed to improve the size and duration of the trees; for example, apples are very commonly worked upon the common wild Crab Stock, and cherries on the great wild black and red cherry Stock, as tending to promote a large, hardy, and durable growth proper for common standards, and the larger kinds of dwarf trees; remarking, however, in using Crab Stocks for general use, on which to graft any sorts of fruit-trees, it is proper to reject such of them as assume a very wild crab-like growth, or of a stunted, thorny nature, preferring those that are the freest clean growers.

However, the appellation of Crab Stocks is also often given to all Stocks indiscriminately, before being grafted; whether raised from the seed, &c. of wild or cultivated trees, being very commonly all denominated crabs until worked with grafts or buds; though probably with some distinction, as wild crabs, and free crabs.

Free Stocks.—The name Free Stocks is commonly applied to such as are raised from the kernels of the fruit, layers, &c. of any of the cultivated garden and orchard fruit-trees and others, which, as they often prove in general more free clean shooters than the generality of wild crabs, have the appellation of Free Stocks, and in several instances, when proving free clean growers, are more eligible Stocks than the wild crabs, particularly for choice apples, pears, peaches, nectarines, apricots, and plums, both to improve the growth of the trees and quality of the fruit, as is observed below in the List of Stocks, and in the culture of the respective sorts under their proper head; observing, however, that as also, in these seedling Free Stocks, some may appear of a wild crab-like growth, or of a stunted thorny nature, as aforesaid; which, when the real Free Stock is intended, should be all eradicated, reserving only the free clean shooters of a cultivated-like growth for grafting and budding.

But, as we noticed above of the crab Stocks, all Stocks raised from seed particularly, both of the wild, and cultivated garden fruits, are, before they are worked, very commonly termed crabs; either wild crabs or free crabs, as before

before observed, and with some propriety; since all seedling Stocks, though raised from the finest fruit, vary so greatly from the original, many of them often assuming a wild crab-like growth, and if permitted to stand long enough without grafting to bear, it is probable the fruit would prove also of the crab nature, intolerably hard and austere; hence the necessity of grafting and budding: but, on the other hand, many of them assume a free, cultivated-like growth; and if trained up without grafting to a bearing state, some out of a great many may produce tolerable good fruit, though probably not above one or two in a hundred or more; which, however, is the method by which all our fine varieties of fruit were first obtained, and the sorts afterwards increased and continued the same by grafting and budding them upon proper Stocks; so that for experiment, might select a few of the most promising of any of these seedling Free Stocks if thought convenient, transplanting them by themselves, to try to gain new varieties; but allotting, however, the general supply to remain for Stocks, for the reception of grafts and buds of the choicer kinds of the already-acquired fruits, for farther propagation.

Dwarf Stocks.—These are raised from low-growing trees, some nearly of a shrub-like nature, and others of but a very moderate tree-growth, being occasionally employed as Stocks on which to graft and bud trees, intended as the lower and middling sorts of Standards, and to form dwarfs, either for walls or espaliers, or as dwarf standards in small gardens, and any others occasionally for variety; and to plant in forcing-frames, or to pot for forcing, or curiosity, &c. such for instance, the paradise apple and codlin Stock, for dwarfing apples, the quince Stock for pears, the bird cherry, morello, and small May cherry Stock for cherries, the bullace and muscle Stock for dwarfing apricots, peaches, and nectarines, and sometimes dwarf-almond Stocks for the two latter, when designed to have these trees of a very dwarfish growth, either to pot for curiosity, or for forcing in small forcing-frames.

Observing, the most dwarfish kinds of Stocks of the above are, the paradise Stock, bird-cherry, black bullace, and dwarf almond; all of which being of very moderate growth, when used as Stocks, they dwarf the trees grafted thereon exceedingly, the head remaining within very small compass, and shooting moderately into wood, soon forms for bearing abundantly in proportion to their size; they, however, are not so proper for any

general culture as common dwarf-trees, as they never attain a large growth, sufficient to produce any considerable quantity of fruit, but continue fruitful of equal duration; so that a few only are proper for variety, or for small compartments of borders, &c. and small gardens, or to pot, or for forcing as aforesaid.

But as to the codlin dwarf Stocks, quince Stock, morello cherry, and muscle-plum Stocks, they being but moderately dwarf, are proper Stocks for the middling, or larger kinds of dwarf trees, either for walls or espaliers, or dwarf and half-standards.

All of which dwarf Stocks, both of the most dwarfish growers, and middling growth, are generally raised either from suckers, layers, and cuttings, as hereafter directed.

But we now proceed to give the list of all the principal sorts of Stocks comprehended in the above three kinds; crab Stocks, free Stocks, and dwarf Stocks, under the names of the respective genus, species, &c. in which they are used for grafting and budding.

List of the various Sorts.

As it is therefore of importance to know all the different sorts of Stocks eligibly adapted for the reception of grafts and buds of the various genera, species, and varieties of trees usually propagated by grafting and budding, particularly all the fruit-tree kinds, and some others, we will exhibit under this head a list of the principal sorts in general use, arranging them separately under the name of the species or variety to which each sort is peculiarly adapted as Stocks, for the reception of their respective grafts and buds.

For apples (*Pyrus malus*).

The Stocks for all kinds of apples, are their own kind, raised from the kernels of any of the cultivated apples or crab for common standards, and the larger kinds of dwarfs; though the wild crab Stock is often esteemed preferable to the free Stock for its hardy and durable nature, on which to graft common standards, and sometimes dwarfs for espaliers; and for lower dwarfs, the codlin, Siberian crab, and paradise Stock are occasionally used; the former for middling dwarfs, and the latter for the smallest dwarfs, as may be occasionally required.

All these Stocks for apples are easily raised, the free Stock and crabs from the kernels of the fruit, and the codlin and paradise Stock, also from suckers, layers, and cuttings. See *PYRUS MALUS*.

For the pear (*Pyrus Communis*).

The pear-tree is grafted and budded principally on pear Stocks for general use, and occasionally on quince Stocks for dwarfs;

raised, the former chiefly from the kernels of any sort of pears; and the latter freely by suckers, layers, and cuttings.

Though the pear Stock is always to be preferred for the general supply of larger trees of the pear kind raised from the kernels of the best summer and early autumn pears, being the most eligible Stock on which to graft or bud for all common Standards, and the larger dwarf pear trees for extensive walls and espaliers.

But to raise either standards or dwarfs of a more moderate growth, they are occasionally worked on quince Stocks, generally raised either from seeds, suckers, layers, or cuttings as aforesaid; for the quince-trees being low moderate growers, when used as Stocks for any kind of pears, they dwarf the trees pretty considerably, rendering them more proper for small compartments and for moderate extent of walls and espaliers, or dwarf standards; and the trees often commence a bearing state sooner than on strong-growing pear Stocks: but this sort of Stock is in more estimation for the melting pears, than the hard breaking kinds, being supposed to improve the fruit of the former, and harden the pulp of the latter; though this is not general: and the quince Stock, at any rate, is estimable principally for its dwarfing property, or at least in being productive of moderate shooting trees for walls, espaliers, or middling standards, sooner arriving to a bearing growth; as, however, pear Stocks are productive of larger trees, more extensively branching, they, when advanced to a settled growth, yield a larger production of fruit in proportion.

Sometimes also, to form dwarf pears, white-thorn Stocks, raised from seed, were formerly in repute, but are very improper, as the trees are rarely prosperous.

Therefore the pear Stock is preferable to use for grafting or budding all the sorts of pears for the general supply of large trees as before intimated; observing, however, as the goodness of a pear is often improved or diminished by the nature of the Stock on which it is grafted, so it is of importance to use principally free Stocks, raised from the kernels of the best summer and autumn pears; and being raised, if any among them assume a wild crab-like appearance, reject them, especially for the prime pears, which should be worked always on the finest free-shooting Stocks of the most cultivated-like growth.

And sometimes, to improve the quality of any particular choice kind of pears as much as possible, some double work them, i. e.

graft the best sorts into free Stocks in the spring, which shooting the same year, then about midsummer or soon after, bud the young shoots of the graft with buds of the prime sorts of pear, suffering only the shoots from the second budding to run up to form the tree: thus the breaking kind of pears are often rendered less hard and stony, and the melting property of others considerably improved; but this double working is not intended for general propagation.

Both the sorts of Stocks for pears are easily raised by the methods above noticed, and as hereafter directed.—See *Pyrus Communis*.

For quinces (*Pyrus Cydonia*).

Two sorts of Stocks are occasionally used for this tree, viz. that of its own kind, and the pear Stock raised, the quince Stocks from seed, suckers, and cuttings, &c. and the pear kinds from the kernels of any sort of pears: but as all the varieties of quinces are so expeditiously raised the same with certainty by layers and cuttings, renders the raising of Stocks for grafting or budding them on almost unnecessary. See *Pyrus Cydonia*.

For plums (*Prunus domestica*).

This tree is worked only upon plum Stocks, raised from the stones of any sort of cultivated plum, and likewise by suckers and layers thereof, as the most certain methods whereby to obtain any particular variety of free plum Stock when required; such, for instance, as the muscle-plum Stock, which many prefer as the best Stock of all on which to work the finer kinds of plums, as generally producing very thriving moderate-growing, fruitful trees; raising it, not from seed, which would vary exceedingly, but principally by suckers from the root of real muscle-plum trees, or of those worked upon the true muscle Stock; or from layer Stocks also of the muscle-plum tree: observe, however, plums almost in general succeed equally well on any kind of free plum Stock; and therefore, the general supply may be raised from any sort of plum, either by seed or suckers, &c. as may be convenient; as directed hereafter.

The plum will also grow upon the apricot and cherry Stock, but not thrivingly for any great duration.—See *Prunus domestica*.

For cherries (*Prunus Cerasus*).

The proper Stock for this tree is that of the cherry kind only; viz. the great wild cherry Stock for large trees, the cultivated garden cherries for more moderate growths, and the bird-cherry Stock for small dwarfs; raised, the two former from the stones of the fruit, and the latter also by seed, or by layers and cuttings.

But

But as for general use, the wild black and red cherry Stocks, being strong free growers, are preferable, on which to raise all common large standard cherries particularly; also the larger dwarf-trees for extensive walls and espaliers; as these Stocks being of strong hardy growth generally produce larger, more hardy, and durable trees than the cultivated cherry Stocks; though in default of these wild Stocks, may use Stocks raised from any of the cultivated garden cherries, to raise common moderate standards and dwarf-trees; it is however of importance to raise the general supply of large trees on the wild cherry Stock, for the reasons above mentioned.

Sometimes Stocks of the morello and May cherry, as being moderate growers, are used, on which to raise the smaller cherry-trees, either in dwarfs for low walls and espaliers, or for small or moderate standards, but remarking of the morello Stock, that if raised from layers you will be more certain of having the real sort in its naturally moderate growth.

And Stocks of the common bird-cherry (*Prunus padus*), being a very moderate grower of the cherry kind, is used, on which to raise dwarf cherry-trees, either to plant in borders, pots, forcing frames, or to pot for forcing, &c. are raised plentifully from seed, cuttings and layers; and have the effect of dwarfing trees worked thereon, exceedingly, so as to bear fruit when but one or two feet high; and they shooting very little to wood, generally bear abundantly for their size.

Cherries will also grow upon plum, apricot, and laurel Stocks, as being all of the same genus, but not proper for general propagation, only by way of curiosity or experiment.

All the varieties of cherry Stocks are raised with great facility by the methods above hinted and hereafter exhibited.—See *PRUNUS Cerasus*.

For apricots (*Prunus Armeniaca*).

The apricot proves the most durable on Stocks of the plum kind, viz. common plum Stocks of any variety for all common wall, espalier, and standard trees; and the bullace Stock for small dwarfs; raised, the plum Stocks from the stones of any kind of cultivated plum, or by suckers from the root; and the bullace from seed, suckers, and layers.

But always chuse the plum Stock on which to raise the general supply of apricots for common use, in general, wall-trees and occasional standards, which succeed almost equally well upon Stocks of any kind of plum, though they probably may prove the most successful on the muscle-plum Stock, like peaches, &c. in being

of a more moderate regular growth, and most prolific nature; but as the difference is not always very material, we may use any kind of plum Stocks that can be the most readily obtained, on which to raise all our principal apricot-trees, for walls, espaliers, and standards.

And the bullace Stock is only used occasionally on which to raise moderate small dwarfs for low walls, or to plant in pots, or in forcing frames for forcing.

Note, the apricot will grow on its own, and on peach and almond Stocks raised from the stones, but never so prosperous for any duration.—See *PRUNUS Armeniaca*.

For peaches (*Amygdalus Persica*).

Several sorts of Stocks are occasionally used for peaches; viz. almond Stocks, peach, nectarine, apricot, and plum Stocks, all raised from the stones of the fruit, and the latter also by suckers and layers; but the plum Stock being the most hardy, is the most eligible for general use.

For the peach is not equally successful and durable on all those kinds of Stocks, on those of the almond, peach, nectarine, and apricot, although they take freely, shoot fair and promising for some years, yet are frequently apt to prove but of middling duration in a prosperous growth: so that the free plum Stock is preferable for all the sorts of peaches and nectarines, as being productive of the most hardy, thriving, and durable trees; though it is remarkable, one sort of plum Stock in particular is generally preferable on which to work peaches, which is that of the muscle-plum, formerly hinted, as producing the most prosperous trees, generally of a more moderate, regular, and fruitful growth, as before observed, and the fruit of superior quality, provided the said Stock is raised genuine; not from the stones, for, as observed before, the seedlings are apt to run into many varieties materially different from the original; but to obtain it more certainly real, is occasionally raised from suckers or layers of the true muscle-plum-tree, or by suckers from the roots of such peach, nectarine, plum, &c. as are worked on muscle-plum Stocks, which generally send up plenty from the roots annually; planting them off at one year's growth into the nursery to train for use: however, for want of a sufficiency of this particular Stock, recourse must be had either to seedling Stocks raised from the stones of the muscle or any other kind of plum, or suckers, Stocks of any of the plum varieties.

Double Stocks or double working, is sometimes used for the more delicate peaches, to improve their bearing and flavour of the fruit; and consists of first budding in the com-

mon way, by inserting buds of any strong shooting peach, almond, or apricot into a plum Stock; and the buds shooting out strongly next summer, then upon the main shoot from the bud, perform the second or final inoculation with buds of the approved sort intended for propagation, suffering the shoots from the second budding only to grow up and form the tree; and by this practice the more prosperous fruitful growth of the trees of the above particular sorts, and the delicate flavour of some sorts of peach fruit is more certainly preserved, and sometimes improved.

For nectarines (*Amygdalus Nucipersica*).

The nectarine is worked upon the same Stocks as the peach, viz. almond, peach, nectarine, apricot, and plum; all raised as observed above for the peach-tree: preferring, however, the plum Stock for general propagation, as for peaches.—See the Stocks for peach trees above.

For almond-trees (*Amygdalus communis*).

The almond-tree when raised for its fruit, the approved varieties may be budded into Stocks of any sort of almond, peach, nectarine, apricot, or plum, raised from the stones, and the latter also from suckers, &c. but the trees are generally the most hardy and durable on plum Stocks.

For medlars (*Mespilus germanica*).

About three or four different Stocks are occasionally used, on which to raise the approved varieties of eatable medlars, viz. medlar Stocks, white-thorn, pear, and quince Stocks, raised, the three former from seed, and the latter expeditiously from suckers, layers, and cuttings; the medlar seedling-raised Stocks are very proper, whereon to graft the approved varieties; and the white thorn and quince Stocks are only used occasionally; but free Stocks, raised from the kernels of medlars or summer or autumn pears, are preferable to the two last-mentioned for all the varieties of common medlar, which either on their own or pear Stocks, generally assume a more free growth, and produce the fruit in greater perfection.

For sweet Service-trees (*Sorbus domestica*).

The domestic or sweet service, when designed as a fruit-tree, have the approved varieties grafted or budded upon proper Stocks: either principally their own Stocks raised from the seed, or occasionally on pear or quince Stocks raised as mentioned just above for medlar and other trees; though either any of the Sorbus, or the pear Stock are preferable to the quince on which to work this tree to have it large and durable, or may use quince Stocks

to have trees of smaller growth, for low standards, espaliers, &c.

For the wild maple-leaved Service berry-trees (*Crataegus torminalis*).

This tree being sometimes cultivated in the garden and orchard for its eatable berries, and to obtain or continue any particular good variety with certainty, they are occasionally raised by grafting or budding, and the proper Stocks are either their own kind, or hawthorn Stocks raised from the seed; they will also take upon pear Stocks, &c.

For hazel nuts, filbert nut, &c. (*Corylus avellana*).

Any approved variety may be continued the same with certainty, by grafting and budding upon Stocks of the common nut-tree, raised either from the nuts, or by suckers from the root; though as all the varieties may be readily increased, and continued the same by layers, &c. with great facility and abundance, the grafting or budding is not commonly practised in their propagation, only in particular cases, in default of layers or suckers of any particular good sort of nut, and that probably cuttings or buds for grafting or budding, can be more readily obtained from neighbouring trees of the sorts intended; and having raised a few trees by this method, they, in two or three years, furnishing plenty of branches to raise a more plentiful supply of layers; and these layer-raised trees, being wholly the same top and root, suckers from the bottom are equally eligible as grafting and budding, for continuing any approved variety.—See *CORYLUS avellana*.

For orange-trees (*Citrus Aurantium*).

The orange-tree is worked upon Stocks of their own kind only, viz. either any kind of orange, lemon, or citron Stocks, raised from the kernels of the fruit; though of the orange kinds, the Seville orange, as being a very free strong shooter, is generally preferred for orange Stocks; but the lemon and citron being also free growers form very proper Stocks on which to raise any variety of orange. See *CITRUS Aurantium*.

For lemon and citron trees (*Citrus Medica*).

Both these varieties are also budded or inarched upon lemon, citron, or orange Stocks, raised from the kernels of the fruit, as observed above for oranges. See *CITRUS Medica*.

Thus far is principally all the sorts of Stocks commonly used for fruit-trees, that are either generally, or occasionally raised by grafting and budding.

For the several other sorts of fruit-trees, not mentioned in the above list of Stocks, such as the

the vine, fig, mulberry, currant, gooseberry, berberry, walnut, chesnut, &c. they in their several varieties, in the first six sorts particularly, being raised and continued the same with great facility either by layers, suckers, or cuttings, according to the different sorts, and some of them by all those methods occasionally, which renders the propagation by grafting and budding unnecessary; and the walnut and chesnut not succeeding perfectly by these methods to become large thriving trees, are raised from the nuts: however, any approved variety thereof, or of most of the above-mentioned sorts, may also be tried occasionally by grafting and budding upon proper Stocks by way of experiment; and the eligible Stocks are principally those of their own kind, raised some from suckers, layers, and cuttings; others also from seed, as exhibited in the culture of the respective sorts, under their proper genera.

For forest and ornamental trees, flowering shrubs, &c.

As to the Stocks proper for such forest-trees, ornamental trees, and flowering shrubs, &c. that are occasionally raised by grafting and budding, either to improve or continue any particular variety, they are for the general part each worked on Stocks of their own kind, as observed above for the generality of fruit-trees; but, as in these kind of trees, the variation of the seedlings being not so numerous and material as in the fruit-tree kind, they do not require to be so generally raised by grafting or budding, only for some particularly valuable variety, or any of peculiar property, such as variegated-leaved, or other remarkable kinds, double flowering variety, or other curious flowering sorts, &c. that cannot be continued the same by seed, but only either by grafting or budding, or by layers and cuttings: though, as the two latter methods are not convenient in all sorts, recourse is had to grafting and budding to increase the above varieties with certainty of the kinds intended, without farther variation; working the respective sorts principally each upon Stocks of its own kind, chusing the strongest free shooters, raised either from seed or suckers, &c. as mentioned in their culture, each sort under its proper genus as observed on former occasions.

General Hints for Experiment.

Sometimes for variety and curiosity in any sort of fruit-trees and others, the same Stock is made to support two, three, or more different varieties of fruit, grafted or budded, either all into the Stock, being previously trained with branches forking off for that purpose one for each graft, or by cleft, or crown-grafting sin-

gle large Stocks, with two or more different sorts; or in smaller single Stocks, by inserting two or more different buds by inoculation; likewise any Stock being singly grafted or budded, may insert different sorts into the shoots arising from the said graft or buds; and thus may have two, three, or more sorts of apples, on the same root for curiosity; the same of pears, plums, cherries, and most other fruits, &c. that are chiefly species or varieties of the respective sorts in the same genus, or that which is very nearly allied, as we have already exhibited; and in several instances, by the same rule and method, may have different sorts of fruit upon the same Stock, as plum, cherries, and apricots all on a plum Stock, or peaches, nectarines, and apricots on the same, or on Stocks of their own kind; and pear, medlars, and quinces upon the pear Stock; also red and white currants, or currants and gooseberries, both on a currant or gooseberry Stock; or white and red grapes on any vine Stock; likewise red and white roses, or other different sorts, upon any common rose Stock; and the same of numerous other trees and shrubs, species and varieties of one genus; remarking, however, this is not recommended for any general practice, but only for a tree or two of any particular genus or species, by way of experiment, variety, and curiosity.

Method of raising the Stocks in general.

With respect to the method of raising all the different sorts of Stocks, it is occasionally by seed, layers, suckers, and cuttings, as hinted above in the list for each particular sort.

By Seed.—Numerous sorts of Stocks are easily raised from seed, consisting of the kernels and stones of the fruit, of the respective trees, such as the kernels of all the apple kinds; kernels of all the sorts of pears and quinces; and the stones of plums, cherries, apricots, peaches, nectarines; the seeds or stones of medlars, services, &c. also nuts, when designed for Stocks; all of which are to be obtained in autumn from their respective fruits when fully ripened: previously laying a sufficiency of the common pulpy fruits together in an heap, and bruise them; suffering them to lie some time to decay as the different sorts may require, in order that the pulp may be more readily cleared from the kernels and stones proper for sowing; or, the kernels of apples and pears may also be procured from any of the accidentally rotten fruits in the fruitery; and sometimes for large supplies, both apple, pear, and crab kernels are occasionally obtained from the cyder presses after the fruit have been pressed for cyder, perry, verjuice,

verjuice, &c. but the stones of plums, cherries, apricots, and the like, must be procured from the fruits as above, as soon as they are ripe; which, together with all the other sorts, may be sown as soon as possible, each sort separate.

All the sorts, both kernels, stones, and other feeds, are to be sown in beds of common earth in the nursery, either directly in autumn, or preserved in sand till February, and then sown.

Observing, however, that for the general part, it is eligible to sow them principally in autumn or early part of winter, as October, November, or December, unless the ground proves of such a wet cold nature, as to endanger their rotting in winter; and that it shall seem necessary to preserve them in sand in a dry apartment until February, as before observed.

However, in any common moderately dry soil, it is advisable to sow them at once in autumn, or as soon as they can be obtained, as it will be both less trouble, and may prove more successful in forwarding their germination; and, if the winter should prove severe, the beds of the more tender kinds, as almonds, and peaches, &c. may be covered with dry litter to defend the seed from the frost.

The method of sowing all the sorts is in beds of any common light earth in the open nursery or seminary, sown either by bedding-in, or in drills, as below.—See NURSERY.

Having, however, previously digged the ground, then if intended to bed in the seeds, divide the ground into four-foot-wide beds, with foot-wide alleys between; and then with a rake or spade trim the earth from off the top of the beds evenly, into the alleys from about an inch, to an inch and half, or two inches deep, according to the size of the different feeds; this done, sow the seeds all over the surface moderately thick, and after pressing them all evenly down into the earth with the back of the spade, cover them in with the earth from the alleys evenly, the depth as above; the kernels of apples, crabs, pears, &c. near an inch deep, the smaller stones about an inch and a half, and the larger sorts full two inches deep. But if it is designed to sow them in drills proceed thus: having digged the ground, and formed it into four-foot wide beds as above advised, then draw drills with an hoe, either lengthways or cross the bed, from one to two inches deep, and six inches asunder at least, sowing the seeds, &c. in the drills, and directly cover them in with the earth the depth of the drills. See SOWING OF SEED.

After having performed the sowings as

above, if the ground is much infested with mice or other destructive animals, which often attack these kind of feeds in winter, it is advisable to set different sorts of traps and baits for their destruction.

The different seeds being thus sown, they will all germinate freely in the spring, and soon come up the same season; observing previous to the sprouting or appearance of the seedlings above ground, that if in those sown in autumn, &c. the surface of the bed proves mossy, or that the top is hard bound or caked, it is beneficial culture to stir the surface lightly with a small iron rake; also if very dry weather prevails, to give frequent moderate waterings both before and after the plants are up; repeating the waterings occasionally in dry weather all spring and early part of summer, to encourage a free strong growth; being likewise careful to keep the beds very clean from weeds by diligent hand-weedings; and by thus giving every encouragement of culture, the seedling Stocks will grow so freely all summer, as by autumn or spring following will be mostly of proper size to plant out into nursery lines in the open quarters, in rows two feet asunder, to remain for grafting and budding; though, if they have made but middling progress this first summer in the seed-bed, and are rather small and weakly, may plant out only the strongest, leaving the rest growing until next autumn, when they will be all of full size for planting out wholly into the nursery quarters.

Therefore, when the Stocks are of due size for removal from the seed-bed, choose for their reception some of the open quarters of the nursery, preparing the ground by trenching two moderate spades deep; then forking the seedlings up out of the seed-bed, shorten any perpendicular tap-root and long stragglers, but leave all their tops entire, and then proceed to plant them in lines, either by trench-planting, slit-planting, or dibble-planting, as the size of the plants admit (see PLANTING), marking out the rows two feet or two and a half asunder, and set the plants one foot or fifteen inches apart in each row, all in an upright position; and having planted one row, then tread the earth gently all along close to the roots of the plants, to fix them firmly in the earth all evenly in a straight range and erect posture; and so proceed row and row till all is planted, levelling the surface of the ground between all the rows with your spades.

As to their future culture till grafted or budded, it consists in occasional waterings the first spring, hoeing the ground every summer to kill weeds; digging between the rows annually

nually in winter or spring; and of training the Stocks each to one stem; preserving their top always entire; but trimming off strong laterals below, to encourage the strength of the main stem, and the aspiring of the top as fast as possible; whereby they will be fit for grafting or budding, in from one to two or three years after planting.

They are generally of proper size for working, when from about the size of a large goose-quill, already observed; or half an inch diameter, to the thickness of a man's little finger, or a little more; but the sooner they are worked after having obtained due size, the better they will succeed, and the sooner you will have them form trees of the sorts intended. See GRAFTING and INOCULATION.

But supposing the Stocks to have shot freely the first summer after planting out from the seed-bed, many of them will probably be of due size to graft the following spring and summer, at five or six inches height, to form dwarfs for walls and espaliers, &c. or even, in some sorts, for full or half Standards; provided the first main shoot from the graft or bud is trained up singly, two or three years to form the stem, of from four or five to six or seven feet stature: however, if the Stocks have grown but moderately the first and second season, and that they are not generally in a condition for the operation of grafting or budding, let them have another year's growth, or till arrived to the before-mentioned size, which may be sufficient for dwarf-trees; also occasionally for standards, when the graft or bud is to form the stem, as above observed; but when designed for standards, and the Stock to form the stem, they must be permitted to stand two or three years longer, trimming off strong shoots below, and still preserving the leading top shoot entire to continue the elongation of the stem to an eligible stature, to receive the graft or bud at five or six feet height for full standards, and three or four for half standards; so that these standard Stocks being arrived to about seven feet height for full, and five or six feet for half standards, and of the before-mentioned thickness at top in the place where the graft or bud is to be inserted, they are of due size for working.

By Suckers.—Several sorts of fruit and forest trees, &c. furnish many suckers from the root annually, very proper to be transplanted for Stocks; such for instance, as codlins, plums, and quinces; also peach, nestarine, and apricots, that are worked or growing on plum Stocks, pears on quince Stocks, any sort of apples on codlin Stocks: likewise most sorts of elms, and many other forest and ornamen-

tal kinds. And the suckers of all these trees being planted off at one year's growth in autumn, winter, or spring, is a very expeditious and eligible method of raising several sorts of Stocks; as that after being transplanted into the nursery, they often in one or two years' growth commence proper Stocks for the reception of grafts and buds; and sometimes many of them will be fit for budding in the summer following at the proper budding season, or for grafting the spring after.

Likewise, in some instances, suckers afford an opportunity of raising Stocks of any particular variety required, with certainty, such as the muscle-plum for peach Stocks, codlin for dwarf apples, and the like particular kinds; for when the trees productive of the suckers are either wholly top and root of the variety intended, or that they form Stocks to other trees, the Stock and root still remaining of the intended sort; and in either case, all the sucker Stocks prove invariably the same as the parent-tree; but this is only to be particularly regarded when any particular variety of Stock is required; in other cases may use suckers of all other fruit-trees, &c. indifferently for Stocks.

They are generally fit to take up for the purpose of Stocks when of one year's growth, about the size of a tobacco-pipe or but little bigger, and should be collected in autumn or early part of winter; taking them up as well rooted as possible, cutting off all knots or knobbed woody parts of the old roots that may adhere to their bottom, trim straggling fibres, and cut off all side-shoots from the stem, then plant them in rows two feet asunder, and one foot distant in the lines; treading the mould gently to their roots, and finish the work by levelling the surface between the rows: thus they will readily take root, and in spring soon show signs of free growth.

Then as to culture till grafted or budded, it is nearly the same as the seedling Stocks, keeping them clean from weeds in summer by hoeing; and probably some of the strongest shooters may be fit to bud in July or August following; though the general part will require two years' growth before they are proper for working; still continuing them all to one stem, by timely displacing strong laterals; and preserve their top or leading shoot generally entire until grafted, &c. which may be performed when they are of the sizes before-mentioned.

By Layers.—Some sorts of Stocks, both of fruit and other trees, may also be raised occasionally by layers; and when any particular variety of Stock is required, such as the paradise

dise Stock for apples, muscle-plum for peaches, &c. they may be obtained of the real sort always with certainty, by layers of the shoots of such trees as are of the intended sort; but as this method of raising Stocks would be attended with great trouble for general grafting and budding, it is only practised occasionally when a sufficiency of any particular sort of Stock intended cannot be obtained, the same with certainty by seed, or suckers, &c. so that in autumn or winter, chusing the young shoots either of such trees whose branches naturally grow near the ground, or the stems have been cut down low while young, to force out branches near the bottom, furnishing shoots properly situated for laying; which being slit-layed in the common method, they will be rooted by autumn following, and fit to plant into the nursery; managing them as directed for the seedling and sucker Stocks.

By Cuttings. — As some sorts of trees proper for Stocks, grow freely by cuttings; such as codlins, quinces, bird-cherry, paradise Stock, &c. a supply of Stocks of these sorts are sometimes raised by this method; chusing cuttings of the year's shoots in autumn, plant them in the nursery in a somewhat shady border, giving occasional waterings the following spring and beginning of summer in dry weather, and they will be well rooted by next autumn, then transplanted in nursery-rows two feet asunder, managing them as the others.

Remarking of the Stocks in general, raised in either or by all the above methods, that as we formerly observed they must always be continued to one upright stem, with their top entire, except any should assume a stunted or crooked growth, in which case, head them down to the ground in spring, they will push out strong from the bottom the ensuing summer, training them to one stem, and with their leading top-shoot entire as abovesaid; and according as all the sorts advance in growth, divest them of strong lateral shoots below, repeating it particularly in the taller standard Stocks to encourage their upright direction more expeditiously to the proper grafting and budding height.

With respect to the different methods of grafting and budding the several sorts and sizes of Stocks, the grafting them is occasionally performed different ways according to the size of the Stock; and the budding them is performed only by one general method to all sorts; remarking as to grafting, the method called whip-grafting is consider-

ably the most eligible for general practice in nursery plants, and especially for small and moderate sized Stocks: likewise budding is also the most successfully performed upon Stocks of similar growth; for example, young Stocks, from about half an inch, to the thickness of the little finger, or but little more in the part where the graft or bud is to be inserted, are of the most eligible general size for all nursery Stocks, either by whip-grafting, or by inoculation, as the different trees may require: though cleft-grafting is also occasionally performed on small Stocks, but not so successfully as whip-grafting, so is more commonly practised for such Stocks as are too large for that method; but large Stocks of an inch or more diameter, succeed very well by cleft-grafting; also sometimes tolerably by budding, but not in general so effectually as smaller Stocks, &c. above mentioned. And such Stocks as have stood to grow very large, perhaps two inches or more in diameter, may also be grafted occasionally with tolerable success, but do not succeed by inoculation: and crown-grafting is generally the best method for such large Stocks; sometimes also cleft-grafting is practised by making several clefts round the top of the Stock, and insert one graft in each, though the working of these very large Stocks is the most generally, and successfully practised when they are growing in the places where they are finally to remain; but, for the methods of performing the operations of grafting and budding the various sorts of Stocks for raising the several kinds of dwarf and standard trees, see GRAFTING and INOCULATION; also the several sorts of trees raised by these methods, as apples, pears, plums, peaches, &c. each in its respective genus.—Also DWARF TREES, STANDARD TREES, WALL and ESPALIER TREES.

After grafting and budding the several sorts of Stocks, they may be then said to commence new trees of the respective sorts with which they are worked, especially after the graft and bud begins to shoot, which growing up into branches, forms the said new tree of the sort intended.

STOOLS, to furnish layers.

Stools are headed-down young trees and shrubs in the nursery, appropriated for the production of an annual supply of lower shoots or branches near the ground, eligibly situated for effecting the propagation of the respective sorts by layers. See LAYING.

Such trees and shrubs as are designed for Stools to furnish layers for the work of propagation, are generally headed down to the bottom

bottom in the nursery, &c. in order to force out more effectually a plenteous supply of branches near the ground, to afford layers conveniently situated for laying down in the earth as aforesaid; which being layed in autumn, winter, or spring, they striking root in a year or two; and each layer commencing a distinct plant, are planted off into the nursery in autumn following; the Stools remaining, send out a farther supply of lower shoots the following summer for laying as before; and thus the remaining Stools continue affording a plentiful supply of branches from the bottom, fit for laying annually, or every other year at least; and hereby propagate the sorts intended with great facility and abundance.

Therefore, as many sorts of trees and shrubs are principally propagated by layers, a sufficient number of the respective sorts in the nursery, &c. should be appropriated for Stools, in proportion to the supply required of the sorts intended; chusing for this purpose some strong young trees and shrubs, which being planted in the nursery, &c. at from five or six, to eight or ten feet distance, according to their size or nature of growth, and after having remained a year or two till firmly rooted, and acquired some substance, then all those of the tree kind, or such others as run up with stems, without affording lower branches near the ground for laying, should, in autumn, winter, or early in spring, be headed down within a few inches of the ground; by which operation they, in summer following, will push out from the bottom plenty of strong young shoots commodiously placed near the ground for laying, which may be performed the succeeding autumn, winter, or spring; or, if you wait till the second autumn, the first shoots sending out many lateral or side shoots the ensuing summer, and thereby probably furnish an additional supply, of a proper growth for laying; and these small laterals are often better adapted for rooting, than the first vigorous shoots that rise immediately from the Stool, and each of which layed will form a new plant; however, you will order this as it shall seem convenient, as some sorts may afford a sufficiency for laying the autumn after they are produced; others may require to grow till the second or third autumn before they are eligible for laying.

As to the method of performing the operation of laying, it being fully explained in all the various ways in practice under its proper head, we will not repeat it here, so refer the reader to the article LAYING.

In most sorts of Stools where the laying is performed in autumn, about October, or November, or early in the spring, the layers are for the general part well rooted in one year, commencing proper plants fit for separation from the Stools in the autumn following, in order for planting out in nursery rows to be trained for the purpose intended; though some very hard-wooded sorts require two summers growth in the layer-bed before they are sufficiently rooted; on the other hand, some sorts being laid in summer in the young shoots of the year, often effect their rooting freely the same season, fit for planting off the following October.

However, in all sorts it is proper to examine the layers in the autumn after they are layed; and all those sorts that are rooted should then be taken off, separating them with a knife from the Stools, with as much root as possible; and directly planted in nursery-rows a foot or two asunder; and the more tender sorts plant in pots for moving under shelter in winter, as directed for each sort under its respective genus; then, when the layers are all thus planted off, let the remaining Stools be trimmed and dressed as below, for providing a fresh supply of layers the succeeding year.

Every year, soon after the layers are separated from the Stools, the latter should be dressed, which consists of trimming the head by cutting off all parts of old branches and scraggy stumps within an inch or two of the main Stool; and then dig and level the ground neatly about and between the whole, and in spring and summer, give occasional hoeings in dry weather to destroy weeds; thus, repeating the same work of dressing, digging, and hoeing every year; and the Stools still remaining, supply you with plenty of layers for years to come.

But sometimes Stools for layers are formed occasionally of trees, &c. that are considerably grown up, not having been headed down to form low Stools, but whose branches are of some considerable height from the ground; and in which case, the branches, if flexible and long enough, are bowed down to the earth; or, if inflexible and too stubborn to bend, are plashed by making a gash or cut on the upper side; or if too large for plashing, or that the nature of the wood will not bear that operation, the tree or shrub is sometimes thrown on its side by opening the earth about the roots, loosening or cutting those on one side to admit of lowering the head sufficiently for laying the branches in the ground.

Sometimes also, Stools being formed of

grown-up trees, whose branches are too high for laying in the full ground, a temporary stage or scaffold is erected on which to place pots or tubs of earth for the reception of the layers.—See LAYING.

STOVE, or Hot-house.

Stoves in gardens are ranges of buildings constructed with brick walling behind on the north, and fronted and roofed wholly with glass sashes next the south, full upon the sun; furnished internally with a pit, or long, wide, and deep cavity for a bark hot-bed; and with flues round the inside of the walls for fires: the whole calculated to produce a certain temperature of heat at all seasons, peculiarly adapted to the culture of the tenderest exotic plants, from the hot parts of the world; also for forcing various plants, both hardy and tender, into flower and fruit, &c. at an early season.

Formerly, before the use of bark-beds was introduced, all Stoves or Hot-houses were worked by fire-heat only, hence they obtained the name of Stoves.

These Stove departments are generally constructed in an oblong manner, ranging in a straight line lengthways nearly east and west, with the glass front, and top, full upon the south sun, or inclining a little to the south-east; and in dimensions, may be from fifteen or twenty, to fifty or an hundred feet long; by twelve or fourteen, to sixteen feet wide in the clear, and from ten to fourteen feet height commonly in the back wall, by five or six in front, including the parapet wall, and upright glass-work together; and with the whole roof over-head sloping to the south entirely of glass-work, supported on proper cross bearers.

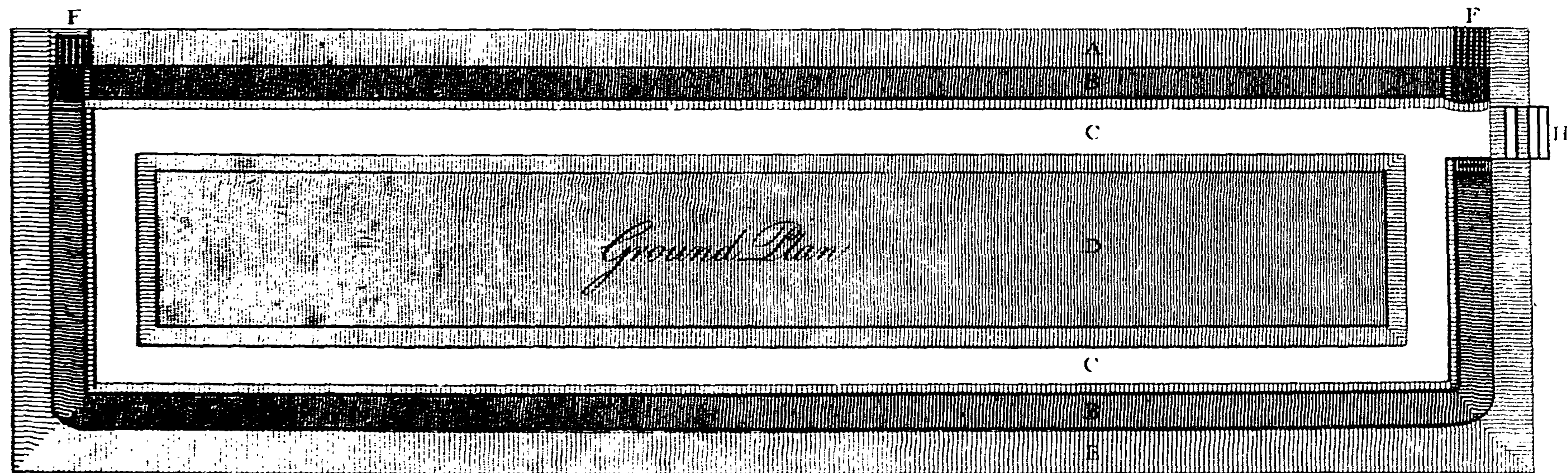
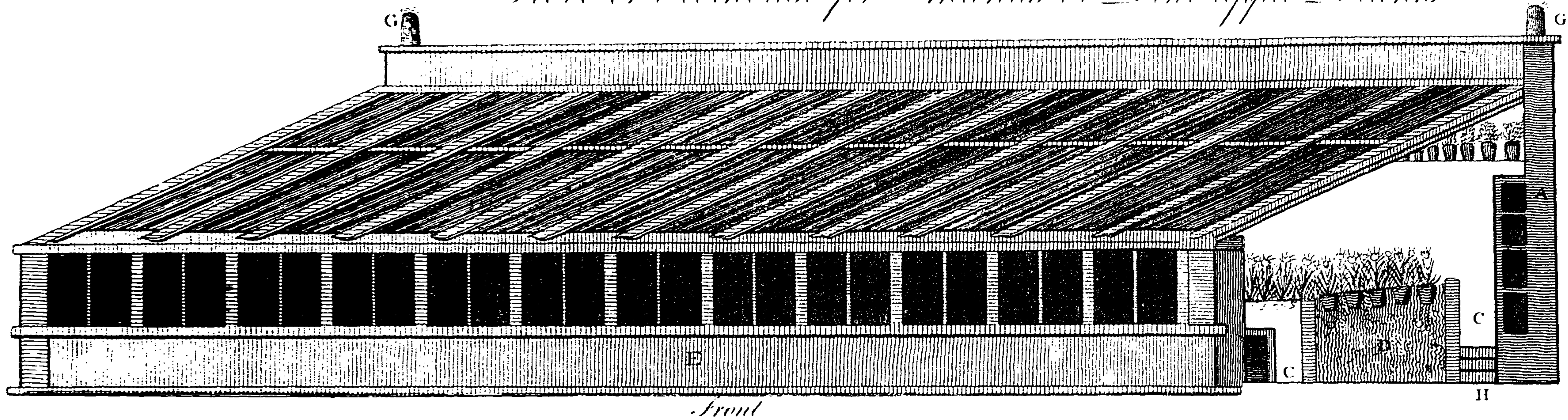
Observing, however, as to its general structure, a wall of brick-work is first formed all round, raised behind from ten to twelve, or fourteen feet height, as just observed; and only two or three feet in the front and both ends, on which to support the upright glass-work, and from the top of which, in front, are arranged the sloping glasses to the coping of the back wall; but previously, in erecting the walls, set out and construct the furnace, or fire-place of the flues near the foundation of the back wall outward, at one or both ends according to the length of the building, or may be in the back part of the end walls; the flues, for conducting the fire-heat, to be ranged internally close along the inside of the back wall, &c. above one another: but, as before noticed, the front and end walling is raised only about two or three feet height, for the support of the timber framing for the upright front glasses nearly head high, including the wall, both ends corresponding with the front

and top framing: a door-way for entrance being formed at one or both ends near the back wall; finishing the timber framing of the top glasses, over-head in one continued slope, from the top of the back wall to that of the crown timber of the front, erecting cross bars for the support of the slope sashes, which should be in two tiers sliding one over the other, the uppermost carried quite home to the crown timbers behind; having no dead roof or cieling in the back part as sometimes practised, but wholly of glass to admit the rays of light, &c. equally in every part; all the glass-work, both front and top sashes being made to slide open occasionally to admit air, &c.

Within side is formed the pit or cavity for the bark bed, and flues for the fire-heat; the pit being ranged nearly the length of the building, six or eight feet wide or more, and three deep; either the lower part sunk a little or raised the greater part above ground, nearly equal to the outer front walls, and formed by a surrounding thin wall of brick:—and in which is made the bark hot-bed, both to assist in warming the internal air, and for the reception of some of the more tender or particular sorts of exotics, plunged therein to have the beneficial moist heat of the tan-bark immediately about the roots, such as is always indispensably necessary for the *ananas*, or pineapple plants in particular: next to the bark-pit wall, is a path or walk eighteen inches or two feet wide generally continued all round; then along against the inside of the main walling are continued the flues constructed of brick-work on edge; each flue about seven or eight inches wide in the clear, by two or three bricks on edge deep, and ranged horizontally one over the other the whole length of the back wall, in three returns or ranges communicating with each other; continued also along the end and front walls in one or two ranges, to be used either generally or occasionally; furnished with a regulator accordingly, to slide open and shut as required; and generally have the flues detached one or two inches from the walls, that the heat may arise from the back as well as the front, which is of very beneficial advantage, the whole proceeding from the first lowermost flue, which communicates immediately from the furnace or fire-place, without side, behind, in the bottom, either of the back wall at one end, or in the back part of the end walls as before hinted, and as the situation admits; or if very long stoves, more than forty or fifty feet length, two fire-places are requisite, one at each end, or both in the middle: each having its set of flues ranging half way; each set of flues terminating in an upright chimney.

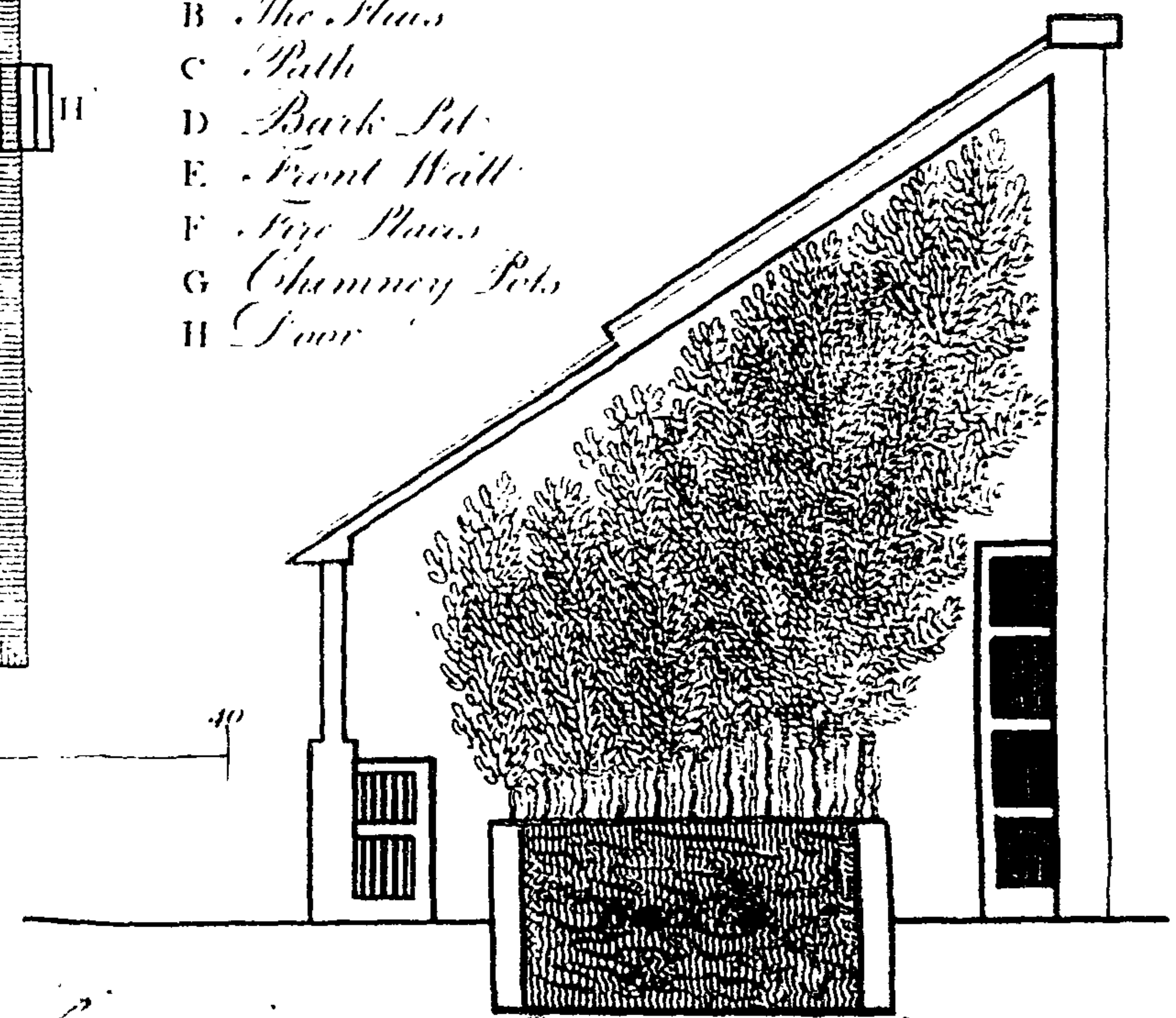
Store or Hothouse for - Guanas or Pine apple - Plants

Facing Ste.



- A Back Wall
- B The Glass
- C Path
- D Bark Pit
- E Front Wall
- F Side Walls
- G Chimney Pots
- H Door

0 5 10 20 30 40
Scale of Feet



View for tender Exotic tall Tree

chimney at the ends of the back wall without, to discharge the smoke after having spent its heat in its passage through all the returns, for the purpose of heating the whole sufficiently to warm the air within; for, in winter and early spring, fires being made in the furnaces every night, the smoke and heat passing immediately into the first bottom flue, thence quickly transmitted through all the others in their several returns, heating them in its passage so effectually, as to diffuse a proper heat sufficiently to warm the internal air in the most agreeable manner, which, together with the bark-bed heat, produces a temperature of warmth proper for the growth of all sorts of tender exotics, both woody, herbaceous, and succulent, from the hottest parts of the globe; as some succeed principally in the bark-bed, others best upon the flues and shelves, &c. or the greater part in any situation in the Stove; as is generally noticed in the culture of the respective sorts under their proper genera; hinted also in the article *STOVE PLANTS*.

The above is a general sketch of the dimensions and formation of a common Stove or Hot-house for general use, proper for the culture of pine apples, and numerous other similar tender exotics; as well as for forcing flowers, fruits, &c. but for further particulars of its construction, see the article of its *General Structure*.

But some Stoves are built considerably more lofty and capacious than the above-hinted dimensions, when intended to cultivate the taller exotics in the greatest perfection possible, according to their nature of growth; and for which purpose there are Stoves erected twenty feet high in the back wall, with width in proportion; by only five or six feet height in the front glasses, in order to suit low as well as high plants; and with the roof sloped quite from the top of the back wall to the front, and wholly of glass-work, having a capacious bark-pit within, formed mostly towards the front; behind which is sometimes a border of earth to receive tall plants in the full ground; so in this kind of Stove may cultivate exotics, &c. from the lowest to almost the highest stature, placing the shortest growth forward, and the tallest behind, according to their several gradations of height.

However, these very lofty and capacious Stoves are not recommended for general use, they being both very expensive in erecting, requiring also a great force of fire-heat to warm the internal air in winter; and not so well calculated for the growth of the general run of exotics, as Stoves of a moderate height: but persons of fortune and curiosity can in-

dulge their fancy in this respect as they think proper.

But the common Stove first described, of from ten to twelve or fourteen feet high behind, and twelve to fourteen in width, by five or six feet height in front, will prove sufficient to raise a great collection of curious tender plants of middling growth.

Thus, in these Stove departments, by the constant moderate heat of the bark-bed obtained the year round, and occasional heat of the flues in cold weather, we are able to produce such a temperature of growing warmth in the internal air equally throughout the building, as is eligible for the growth of all sorts of tender exotics from the hottest regions of the East and West Indies, &c. which, in this country, could not possibly exist, in winter especially, without the constant shelter of such a conservatory, assisted by the above artificial heats of bark hot-beds and actual fire, by which we can imitate the hot climates of Africa, Asia, and America so nearly as to raise the plants of those countries and make them flourish as in their native soil, and some of them made to yield their fruit in high perfection; exemplified in the *ananas* or pine apple particularly, which indeed is almost the only sort of our Stove exotics that afford any material useful production.

Likewise, by the aid of Stoves we are enabled to forward many of our hardy plants to early perfection, such as various sorts of curious flowers, fruits, fallads, kidney beans, strawberries, &c. probably one, two or three months sooner than they could possibly be obtained in the open ground.

Also many sorts of seeds, cuttings, and layers of exotics are made to grow freely in the bark-bed of the Stove, that without such aids would not grow at all in this country; likewise, even cuttings, &c. of many curious hardy plants that root rather reluctantly in the full ground, may be facilitated very considerably in their rooting by the Stove bark-bed.

Of the different sorts of Stoves.

There are, however, different sorts of Stoves used occasionally for different purposes, viz. a Bark Stove for common use, being accommodated both with a bark-bed and flues: a Dry Stove for some particular very succulent plants, &c. is furnished only with flues for fires, and no bark-bed: a Forcing Stove purposely for forcing hardy fruits, flowers, &c. to early perfection; being constructed, some both with bark-bed and flues, and some only with flues and no bark-bed. See each sort described below under their respective heads:

BARK STOVE, DRY STOVE, and FORCING STOVE.

BARK STOVE.

The Bark Stove is so called, as being furnished with an internal pit for a bark-bed as well as with flues for fire-heat; its general construction has already been described; and is the most universally used, as the most eligible Stove for the general culture of all kinds of the tenderest exotics, as well as for forcing several sorts of hardy plants, flowers, and fruits occasionally to early perfection; for the bark-bed being designed to effect a constant moderate moist heat the year round; and the flues are used occasionally for fire-heat in winter, or during the cold weather, to produce an additional warmth in the internal air, as may be requisite at that season; the bark-bed being formed of that useful material tanner's bark, commonly called tan, (see BARK BED) and being made the whole width, depth, and length of the bark-pit, is productive of a uniform moderate growing heat of long duration, peculiarly adapted for the immediate reception of many of the tenderest exotics, that require to be constantly plunged in their pots in the bark-bed; such as the pine-apple, &c. in order to enjoy the benefit of that durable, moist, bottom heat about their roots, peculiar to bark hot-beds only, whose heat also evaporates and warms the air of the Stove at all times; and when the cold in autumn, and winter commences, the bark-bed alone not producing a sufficient temperature of heat to warm the internal air effectually, fires are made in the furnace of the flues every night, also on days occasionally during the winter season, to produce an additional internal heat, as before observed; so as the whole may both effectually keep out frosts and the effects of cold damps, and support a constant regular temperature of heat within adapted to the nature of the plants of this department; being generally directed in this by a well graduated botanical thermometer placed constantly in the Stove, distant from the fire-place, and as much in the shade as possible, that neither the fire nor sun may affect it, and the fluid thereof only raised by the air of the house to a proper degree; supporting always such a state of heat, as to raise the spirit in the tube to the degree marked *ananas*, the standard for pine-apple Stoves, not exceeding five or ten degrees under or over that standard; which thermometers are certain guides to regulate the proper growing fire-heat requisite in winter for the culture of Stove exotics in this country.

There are hardly any exotics from the hottest parts of the world, either woody, herbaceous, or succulents, but may be cultivated in this

kind of Stove (Bark-stove) by placing them in different situations as their natures may require; and many sorts of hardy plants, forwarded in growth, both esculents, flowers, and fruits.

In the arrangement of the plants in this Stove, some require the bark-bed, others succeed in any part of the house; and others, such as the succulents, require the driest situation near the flues: many of the more tender, herbaceous, and shrubby plants, natives of the hottest countries, generally succeed best plunged in the bark-bed; though many sorts, or the greater part, both herbaceous and woody, succeed well enough in any part of the Bark Stove; as most commonly in a general hot-house, the bark-bed is principally allotted for the pine-apples; and most of the smaller succulents particularly, may be stationed mostly over the top of the flues upon shelves out of the way of moisture, as being of themselves naturally very replete with humidity. And as to any hardy plants designed for forcing, such as strawberries, kidney beans, and various sorts of flowers, &c. that being potted, may be placed upon shelves, or on the parapet wall of the bark-bed; but the nearer the glasses the better, particularly the strawberries; but may raise good early kidney beans in almost any part of the Stove; though, when intended to forward any sort of flowers, such as roses, pinks, &c. or any bulbous flowers as early as possible, may plunge some in the bark-bed, the others placed upon shelves, &c. will succeed them: thus, in this kind of Stove, besides its use for raising pines and other tender plants, may forward numerous hardy plants both for use and curiosity.

DRY STOVE.

This is called a Dry Stove, because it is furnished only with flues for fires and no bark-bed; and consequently produces a more dry heat in the air within, than the bark Stoves; intended, however, principally, for the culture of some very succulent tender exotics of parched soils, that require to be kept always dry; though this was the first invented Stove for general use, before the use of bark-beds was introduced and brought to such perfection in Stoves, where, by their moderate, durable, moist heat, we are able to cultivate most sorts of tender exotics generally in greater perfection than in Dry Stoves; in which, by the constant fire-heat all winter, night and day, the fibres of the roots are subject to dry too fast, and prove injurious to many sorts of plants that are not of the very succulent tribe; however, some persons, who cultivate full collections of exotics, erect dry Stoves in which

to deposit the most succulent plants separate, for fear of the other plants, which perspire more freely, should occasion a damp air in winter, and be imbibed by the succulents, and injure them, as being impatient of much moisture in that season particularly.

In this kind of Stove some movable stands or shelves are erected above one another, theatre ways, on which to place the pots of plants, such as the tenderer sorts of aloes, cereuses, euphorbiums, melon-thistle, and other very tender succulent plants, &c.

Though most of the tender succulent kinds of the Stove temperature above alluded to, are also occasionally cultivated in a common general Stove or Hot-house, along with other Stove exotics of different natures of growth; and mostly with a degree of desirably effectual success, in common with the other plants of that department.

FORCING STOVE

Is intended principally for forcing various sorts of hardy plants, flowers, and fruits, &c. to early perfection; some Forcing Stoves being designed principally for flowers, as is common about London, to force large quantities of early roses, pinks, and numerous other flowers for market, where they fetch a very great price at an early season. Other forcing Stoves are intended principally for fruit-trees, and some serve both for forcing flowers and fruits, and several sorts of small plants, as strawberries, kidney-beans, &c. so that these forcing Stoves consist of two kinds, viz. a bark Forcing Stove, being furnished both with a bark-bed and flues; a fire Forcing Stove, having only flues for fire and no bark-bed.

The former of which, the bark Forcing Stove, is constructed like a common Bark Stove, already described, being furnished with a pit for a bark-bed to receive the pots of some particular sorts of plants intended for forcing, in order to forward them as early as possible; and with flues for fire-heat occasionally; and sometimes is formed capacious enough in width to admit of a border of earth behind the bark-bed, next the back wall; serving for fruit-trees, to be planted in the full ground; such as cherries, peaches, apricots, &c. for early forcing; and the bark-bed being for receiving various sorts of plants in pots in winter, for forcing to maturity of growth or production in that season or early in spring; may accordingly introduce pots of roses, pinks, dwarf tulips, hyacinths, narcissuses, honeysuckles, hypericums, and many other flower plants of small or moderate growth, both of shrubby and herbaceous kinds, that may be required early in flower; also may forward any curious

tender annual flowers in the bark-bed, such as balsamines, &c. likewise may have pots of strawberries, dwarf cherries, and other small fruits plunged either in the bark-bed, or placed any where towards the glasses; also pots or boxes of kidney-beans, fallading, &c.

The season to begin forcing or fire-working this Stove, is principally from about Christmas to Candlemas, according to the earliness the flowers and fruits, &c. may be required; having the plants and trees intended for forcing in pots, previously potted either a year before or in the preceding spring or autumn, and in winter sheltered from severe frost till the forcing time arrives; though for such plants as are to be raised from seed, this should not generally be sown till the time the pots are placed in the Stove for forcing; but the shrub and tree kinds, in particular, if planted or potted the preceding year or before, that they may be well rooted and firmly established in the earth, will be of essential advantage; all of which being previously raised in the open ground till advanced to a proper growth for flowering and fruiting; and the fruit trees at the same time, trained in the requisite order; then those intended for planting in the internal border of earth behind, if any, should be planted fully therein early in autumn, without being potted; some of which, such as peaches, nectarines, apricots, &c. to be there trained as wall-trees, others as low standards, particularly cherries: and vines, planted also against the front without-side, have the stems trained in through small holes, and conducted up under the sloping-glasses; as directed below in the fire Forcing Stove.

Agreeable to these intimations, and the forcing season, as above, being arrived, having previously prepared the bark-bed, in proper time accordingly, and plunged therein the pots of plants intended; and placed pots of small plants upon the shelves and top of the flues, such as strawberries, kidney-beans, pinks, and pots of any curious or desirable low or moderate-growing flower-plants, roots, &c. in similar situations; as also any intended dwarf or small fruit-trees being some in pots, placed any where the most convenient, others planted fully in the border of earth, if any; they will all soon be set in motion by the bark-bed heat; afterwards begin also making moderate fires on cold nights, likewise on days occasionally, in very severe weather, to support a constant proper warmth to continue the plants always in growth moderately; and thus may obtain various flowers and fruits two or three months before their natural season in the open air.

The other kind of Forcing Stove, worked by

by fire-heat only, is furnished with flues and no bark-bed, but otherwise constructed like any other common Stove, having flues all round the inside walls for fire-heat; and is designed principally for forcing fruit-trees, having the whole or most part of the bottom space within formed of good rich earth full two feet deep, in order to plant the fruit-trees entirely in the ground to remain; an alley or walk being either formed next the back wall, or carried along the middle, allotting a raised border along the back part, for the reception of the choicer fruits to be trained as wall-trees; and the main middle space for small standards of moderate growth.

Here may be planted for forcing, the best sorts of apricots, peaches, nectarines, cherries, plums, vines, and figs; likewise, any small fruit plants, as gooseberries, currants, raspberries; also tufts of strawberries. All of which being first trained in the open ground to a bearing state.

For in this kind of Stove, having the bottom space formed of good rich earth as before observed, it admits of planting the trees, in the full ground; peaches, nectarines, apricots, and figs principally toward the back wall, and trained to a treillis as wall-trees: others, such as cherries, are planted as standards, both small-headed, moderate, full standards, half standards, and dwarfs, disposed in the middle space, the tallest behind and the lowest forward; and may have also pots of strawberries and low flowers, upon shelves near the glasses; and vines being also planted either within towards the front, or wholly without side, close against the front wall, and the stems or a strong shoot of each plant drawn in through a small hole made for each, either in the wall, or in the timber of the front erections; and the branches within are trained up to the inside of the slope glass upon treillis work, where they often produce abundance of fine fruit at an early time, generally observing, that in those vines planted on the outside, it is advisable to guard the stems in winter, especially some time previous to, and during the forcing season, with hay-bands wrapped closely round them, also to lay some dry mulch over the roots, to protect the whole as well as possible at that time, that the progress of the sap may not be much retarded by the external cold, and to promote its flowing more freely for the advantage of the internal growth of the vines, &c.

This kind of Stove is worked entirely by fire-heat, and the season to begin forcing or making the fires, is January or early in February, continuing it moderately every night and

morning, during the cold weather in winter and spring; to forward the different fruits to as early perfection as possible.

Some other sort of forcing Stoves for fruit-trees are contrived also with a low pit for a bark or dung hot-bed, or dung and bark together; beginning first to force the trees moderately with only the hot-bed heat; afterwards, gradually apply the fire-heat on nights, increasing its strength by degrees.

Other orders of Forcing Stoves come under the denomination of hot-walls or fire-walls, designed principally for forcing fruit trees, and worked wholly by fire-heat; being ranges of brick or stone south walling, fronted with sloping glass frames, inclosing a space of four, five or six to eight or ten feet wide, furnished with internal fire flues, and having a range of some different sorts of choice wall-fruit-trees, extending in a regular expansion along the said walling, or to a detached treillis, and trained in the wall-tree order; they, by means of the fire-heat communicated by the flues, within the glass-framing inclosure, are forwarded to early production of their respective fruits very agreeably in considerably good perfection.

In these kind of fire-wall Forcing Stoves, the flues in some are erected against the main walls, in two or three returns over one another, and the trees planted a little forward detached some small distance in front of the said flues, and the branches trained in regular order to a light treillis, continuing also a low range of flues forward along near the front and both ends, in order to have the advantage of communicating the whole benefit of the fire-heat as fully as possible, either generally or occasionally as may be required: in others, having no flues behind, the trees are trained close against the main back wall, and the flues placed forward in a low range, extending along near the glasses; and sometimes carried longitudinally along the middle space in one or two separate or distinct ranges, parallel; all the different flues communicating with each other:—and with respect to the trees, &c. for forcing herein, any of the principal sorts of the choicest wall-fruit kinds are occasionally introduced, such as those of peaches, nectarines, apricots, cherries, plums, figs, grapes, &c. generally all planted in the border within; sometimes also some small fruit plants introduced in pots, as strawberries, currants, &c. and the forcing being commonly commenced in January or early in February, by daily fires, made every evening and morning in a moderate degree, the trees are thereby forwarded to early growth, in blossoming and fruiting;

fruiting; and ripe fruit is obtained in early perfection accordingly. See *Forcing Frames* and *Hot-walls*.

In all these kind of Forcing-frame Stoves, every summer after the trees have yielded their produce, the top glasses, &c. should be removed to admit the free air, showers, &c. to strengthen and harden the shoots of the year properly, and should remain open until winter; but for more particulars in respect to forcing fruit-trees, see the article **FORCING FRAME**.

The different Structures of Stoves.

Stoves, for the various purposes above noted, are formed upon different plans, according to the fancy of the owner or inventor; though there is only one good plan we would recommend for general use.

We formerly noticed that Stoves are for the general part ranged lengthways nearly east and west, that the glasses of the front and roof may be full upon the sun; this will be found to be the most convenient and eligible plan for a common Stove for general use and good success, for the purposes before-mentioned, either for a common bark Stove for pines and other exotics; or any other kind of Stove.

There are, however, Stoves of late inventions erected on the following plans.

Some, instead of ranging lengthways east and west, are ranged directly south and north, having a double sloped glass roof, being sloped to each side like the roof of an house, sloped also at the front or south end; both sides and the south front end being of glass; which kind of Stove, as to dimensions, is from ten or twelve to fifteen or twenty feet wide, the length at pleasure; and from ten to twelve feet high in the middle, both sides nearly head height; formed by a brick wall all round, raised only two or three feet on both sides, and south end; but raised at the north end like the gable end of a house, to correspond with the above-mentioned double sloped glass roof; and upon the top of the side and south end walling, is erected the framing for the glass-work, which is sometimes formed two or three feet upright immediately on the top of the wall, and sloped glass-work above; and sometimes is wholly of a continued slope on both sides, immediately from the top of the side walls to that of the middle ridge: within, it is furnished either with one or two bark pits; but if of any considerable width, generally with two pits ranging parallel, one under each slope of the top glass; separated by a two feet path running along the middle of the Stove; and sometimes continued all round each pit; and with flues ranged along against the inside walls, the whole terminating in an

upright funnel or chimney at the north end.

Other kinds of Stoves are formed entirely square, having a ten or twelve foot brick wall behind; that of the front and both sides, only two or three feet high for the support of the glass-work, placed upright nearly the same height, and sloped above on both sides and front, also wholly of glass; and is furnished within with bark-pit and flues like the others.

And some Stoves are made semicircular, others entirely circular, formed with a two or three-feet brick wall supporting the glass framing, which is continued quite round; having the bark-pit also circular, and flues carried all round the inside of the walling, terminating in a chimney on the northern side.

However, we have in general observed, that the common straight Stoves ranging in a line nearly east and west, with the main range of glass work in front and top full upon the south, as before-mentioned, are the most commodious, as well as generally prove the most successful in the end, take summer and winter, both for the culture of all kinds of Stove exotics; also for forcing any kinds of fruits, flowers, and esculents; and is the plan we would recommend for general use, though sometimes in situations limited to room and exposure, Stoves are erected more or less inclining to an east or westerly aspect; but in general, where the situation admits, should always stand southward, as much as possible.

Stoves or Hot-houses of this plan are of different dimensions, according to the sizes of the plants they are designed to contain, though the most general Stoves for all the aforementioned purposes are but of moderate height, not exceeding ten or twelve to fourteen feet behind, and five or six in front, as in all common pine-apple Stoves; but some are built much more lofty behind, as before observed, to admit of the taller-growing exotics placed towards the back part, to grow up accordingly in a lofty stature; but Stoves of a moderate height as above, are best adapted to the culture of pines and other moderate-growing plants, as well as for forcing: for very lofty Stoves require both a greater force of heat to warm the inclosed air effectually, and the glasses being so high, the plants receive less benefit of the sun, and are apt to draw the pines &c. up too fast into long slender leaves, as they naturally aspire towards the glasses; but in lower Stoves, where the top glasses are but a moderate distance from the plants, they receive the benefit of the sun's heat more effectually, which is particularly essential in winter, and the plants do not draw so fast in a weakly stature,

stature, but become more stocky at bottom, and assume a more robust firm growth, particularly the pine apple, and thereby more capable of producing large fruit: on which consideration, a general Stove or Hot-house, intended principally for the culture of the *ananas*, and various other tender exotics, and for forcing flowers, fruits, &c. should never be built very lofty, but of the moderate height before observed, which will be found very eligible dimensions.

It may be observed, from foregoing intimations, that a Stove may be large or small, according to fancy or convenience; for even in a moderate sized Stove, a person may indulge his fancy with a great number of the more curious sorts of tender exotics, as well as forward many sorts of hardy plants, flowers and fruits to early perfection, at a moderate expence for bark and fuel; but where a more general or grander collection is required, either for pleasure or profit, the dimensions of the Stove must be enlarged proportionably; so that a common Stove for either, or all of the above-mentioned purposes, may be of any length, from fifteen or twenty to fifty or an hundred feet, as before suggested, by twelve to fourteen feet wide; ten to fourteen feet high behind, by five or six in front, including the dwarf wall, and upright glass-work together, as before observed.—See the particulars below.

Its general Structure, &c.

Having, however, determined on the size or dimensions, as to length and width, &c. of the intended Stove, the following are some further general sketches of the dimensions and construction of the different parts of the building, supposing it is designed as a common bark Stove for general use; being furnished with a bark-pit and flues, &c. which may also serve as hints for the erection of any other sort of Stove.

Proceeding to set out the foundations of the walls accordingly of brick-work, allowing also due width at bottom to support the flues a foot wide, wholly on the brick foundation; detached an inch or two from the main walls; then setting off the back or north wall a brick and half or two bricks thick; and the front and end walls nine inches, carrying up the back wall from ten to fourteen feet high; but that of the front and ends only about two feet to a yard high, upon which to erect the upright timber framing for the perpendicular glasses; previously observing in carrying up the walls, to allot a proper space for a door-way, at one or both ends towards the back part; setting out also

the furnace or fire-place of the flues in the bottom foundation, towards one end of the back-wall behind, formed also of brick-work, and made to communicate with the lowermost flue within; though if a very long Stove, of more than forty feet length, a fire-place at each end will be necessary; or if more convenient, may have them in the back part of the end walls, or both in the middle way of the back wall, as formerly mentioned; each communicating with a separate range of flues; in either case, forming them wholly on the outside of the walls, about twelve or fourteen inches wide in the clear, but more in lengthways inward; the inner end terminating in a funnel to communicate internally with the flues as above observed; fixing an iron-barred grate at bottom to support the fuel; calculated either for coal, wood, peat, turf, &c. as may be the most conveniently obtained; an ash hole being underneath, and just above it, is the mouth or fuel door, to admit the fuel, &c. being about ten or twelve inches square, having an iron frame and door fixed to shut with an iron latch as close as possible; raising the whole furnace sixteen or eighteen inches in the clear, finishing the top archways; then proceed in carrying up the main walls regularly.

Thus far observed, continue carrying up the walls of the building the thickness and height above mentioned; and within-side, erect the flues, close along the walls: but as formerly intimated, it would be advisable to have the flues a little detached from the walls, one, two, or three inches, that, by being thus distinct, the heat may arise from both sides of the said flues, which will be a particular additional advantage in more effectually diffusing the whole heat thereof internally in the house; for when the flues are attached close to the walls, a very considerable portion of the heat is ineffectually lost in that part of the wall behind: likewise, in the erection of the flues, should generally continue them also along the front and both ends, in one range at least, in the order as above; as the front and end flues, arranged near the upright glasses, are particularly efficacious, both as in conjunction with those next the back wall, the heat is more equally and effectually diffused regularly in all parts of the Stove, and being situated near the outward front and end glasses, aforesaid, the heat thereof is also more effectual in repelling the injurious effects of the cold external air, frost, damps, &c. from penetrating internally; generally raising these said flues as high as the outward front and end walls, in one or two ranges, one over the other;

other ; and on the top of which may place pots of many small plants, both of Stove exotics, and plants for forcing, as strawberries, kidney-beans, &c.

So that, agreeable to those intimations, proceeding in the construction of the flues, generally about a foot wide, in the whole including six or eight inches in the clear, formed with brick-work, on edge ; the first lower flue communicating with the furnace or fire-place without, and raised a little above it, -to promote the draught of heat more freely, continuing it along also above the intended level of the floor of the back alley or walk of the Stove ; six or seven to eight inches width in the clear, as before observed, and three bricks, on edge, deep, returning it in two or three ranges over one another, next the back wall, and in one or two along the ends, and front wall, as the height may admit ; each return two bricks, on edge, deep, and each tiled or bricked over, as mentioned below ; and in the beginning of the first bottom flue may have a sliding iron regulator, to use occasionally, in admitting more or less heat, as it may seem necessary ; being careful, as they proceed, that the brick-work of each flue is closely jointed with the best sort of mortar for that purpose, and well pointed within, that no smoke can break out ; having each return closely covered, with broad square paving tiles on the brick-work ; covering the uppermost flues also with broad, thick, flat tiles the whole width, all very closely laid and joined in mortar ; and the said uppermost or last range of flues, to terminate in an upright vent or chimney at one end of the back wall, or if two separate sets of flues, a chimney at each end, as formerly noticed ; and may contrive an iron slider in the termination of the last flue, next the chimney, to confine the heat more or less on particular occasions, either by the heat going off too quickly, or becoming of a too weakly degree.

Sometimes, in considerably wide Stoves, in erecting the flues, when thought necessary to make all possible advantage of the fire-heat, one or more spare flues, to use occasionally, are continued round the bark-pit, carried up against the surrounding wall thereof, but detached an inch or two, to form a vacancy, both for the heat to come up more beneficially, and that, by having vent, it may not dry the tan of the bark-bed too much ; and in which flues, either to use occasionally or generally, may at the beginning have a sliding iron regulator, above mentioned, either to admit or exclude the heat less or more, as it may appear expedient ; so that the smoke run-

ning through a larger extent, it spends its heat wholly in the flues before discharging in the chimney.

Should be very careful, that neither the fire-place nor flues is carried too near any of the wood-work, lest it should take fire.

Proceeding, however, within, to set out the cavity for the bark-pit, first allowing a space next the flues for an alley or walk, eighteen inches or two feet wide all round, and then in the middle space is formed the pit for the bark-bed, six or seven feet wide, the length in proportion to that of the Stove, and a yard deep ; being formed by a surrounding wall, and may either be sunk at bottom a little in the ground, raising the rest above, by means of the raised parapet wall ; or if there is danger of wet below, it should be raised mostly above the general surface ; and in either case, surrounding it wholly in width, length, and depth, with a nine-inch wall ; though a brick-wide wall is often made to do, especially that which forms the parapet above ground ; coping it all round with a timber plate or kirk, framed and mortised together, which effectually secures the brick-work.

Then the bottom of the pit should be levelled and well rammed, and if paved with any coarse materials, it would be an advantage in preserving the bark.

The path or alley round the pit should also be neatly paved with brick or stone ; this walk being very necessary for the convenience of performing the occasional operations of culture, as well as to admit of walking round, to view the plants and gather the produce of such as yield any ; as in the pine apple, and such plants as are occasionally introduced for forcing.

Next, in respect to the timber-framing and glass-work, for inclosing the whole, consisting wholly of a close-continued range of glass-fashes all along the front, both ends and roof, quite up to the back wall ; each fash being a yard, or three feet six inches wide ; and for the support of which, framings of timber are erected on the brick-wallings, conformable to the width and length of the fashes.

So that, for the reception of the perpendicular glasses in the front and ends, a substantial timber plate is placed along the top of the front and end walls, upon which is erected uprights, at eligible distances, framed to a plate or crown-piece above, of sufficient height to raise the whole front head high, both ends corresponding with the front and back ; a plate of timber being also framed to the back wall above, to receive the slop-

ing bars from the frame-work in front; proper grooves being formed in the front plates below and above, to receive the ends of the perpendicular sashes, sliding close against the outside of the uprights all the way along the front, or may be contrived for only every other sash, to slide one beside the other, as may be convenient, for admitting fresh air, &c.

From the top of the upright framing in front, are carried substantial cross-bars or bearers, sloping to the top of the back wall, where being also a timber plate, are framed at both ends to the wood-work at regular distances, to receive and support the slope glasses of the roof, placed close together upon the said cross bars or rafters, and generally ranging in two or more tiers, sliding one over the other, of sufficient length together, to reach quite from the top of the upright framing in front, to the top of the back-wall: the cross-bars being grooved length-ways, above, to carry off wet falling between the frames of the sloping lights; making the upper end of the top tier of glasses shut close up to the plate in the wall behind, running under a proper coping of wood or lead, fixed along above close to the wall, and lapped down of due width to cover, and shoot off the wet sufficiently from the upper termination of the said top sashes; though some wide Stoves, exclusive of the main slope sliding glasses, have a shorter upper tier of glass always fixed in the same place; the upper ends close to the back wall secured under a coping as above, and the lower ends lapping over the top ends of the upper sliding tier, and this over that below in the same manner, to shoot the wet clear over each upper end or termination; likewise along the under outer edge of the top plate, or crown-piece in front, may be a small channel to receive the water from the slope glasses, and convey it to one or both ends without running down upon the upright sashes; being careful that the top part behind is well framed and secured, water-tight, and finish the top of the back wall a little higher than the glasses, with a neat coping the whole length.

In every part, the bars of wood which support the glasses should be neatly formed, neither made very broad nor thick to intercept the rays of the sun; making those, however, at top, strong enough to support the glasses without bending under them. But, in wide Stoves, uprights are arranged within at proper distances, to support the cross rafters more effectually.

The glazing of the sashes should generally be in the imbricated manner, more especially

the slope sashes of the roof; so that the panes of glass should be laid in putty, with the ends lapping over each other about half an inch; the vacancies of which are by some closed up at bottom with putty, others leave each lapping of the panes open, in order both for the air to enter moderately at the imbrications, and that the rancid vapours arising from the fermentation of the bark-bed, &c. within, may thereby be kept in constant motion without condensing much; and also that such as condense against the glasses, may discharge itself at those places without dropping upon the plants; but as to the upright sashes in front, they may either be glazed as above, or the panes laid in lead work; being very careful in both places to have the glazing well performed, proof against wet.

A door way for general entrance having been formed at one or both ends of the building near the back wall, the door of which should generally have the upper half sashed and glazed to correspond with the other adjoining glass-work of the ends.

Within-side of the building, the walls should be plastered, pargeted, and white-washed; and all the wood-work, both within and without, painted white in oil colour for its preservation, and to give the whole a lively appearance, as well as to reflect the rays of light upon the plants on nights, which is supposed proves of some importance in improving their growth.

As to any necessary internal erections, there may be ranges of narrow shelves for pots of small plants, erected where thought most convenient, some behind, over the flues, a single range near the top glasses towards the back part, supported either by brackets suspended from the cross bars above, or by uprights erected on the parapet wall of the bark-pit: a range or two of narrow shelves may also be placed occasionally along both ends, above the flues; all of which shelves will serve for holding pots of many sorts of small plants, that do not require to be plunged in the bark-bed; also for pots of strawberries, flowers, &c. in winter and early in spring for forcing; which being placed near the glasses, are generally the most prosperous and successful in their respective productions.

In wide Stoves, if the cross-bars or bearers of the slope or top glasses appear to want support, some neat uprights, either of wood or iron, may be erected upon the bark-bed walling, at convenient distances, and high enough to reach the bearers above, and support them effectually in their proper position without bending under the glasses.

Without

Without side of the Stove behind should generally be erected, either a shed the whole length, or at least a small covered shed over each fire-place, with a door to shut, for the convenience of attending the fires, and keeping them regularly burning.

But if the situation admitted, a close shed, erected all the way against the north side of the back wall, would be the most advisable, as it will both beneficially defend the back of the Stove from the outward air, and if the fire places are behind, it will be convenient for attending and preserving the fires as aforesaid; serving also to stow fuel for the general use of the Stove, also for garden tools, and all garden utensils when not in use, to preserve them from the weather. As also to lay portions of earth in occasionally, to have it dry, for particular purposes in winter, and early spring.

Some stoves, or hot-houses, are furnished with top covers to draw over the glasses occasionally, in time of severe frosts and storms; sometimes, by slight sliding shutters, fitted to the width of the separate sashes; but these are inconvenient, and require considerable time and trouble in their application; others are formed by rollers of painted canvas, rolled up on long poles or rollers, and fixed lengthways all along the top of the Stove, just above the upper ends of the top sashes, which, by means of lines and pulleys, are let down all at once in a minute, and by the same means are rolled up again almost as expeditiously; though these are sometimes liable to violent winds moving and dashing them with force against the lights, and break the glasses; but many Stoves have no other covers, than occasionally using large garden mats, in very rigorous frosts, both on the top and upright glasses.

Thus far is principally all we have to say concerning the general structure of a Stove, which may serve to convey some necessary intimations; and as most builders are now well acquainted with the general plan, by giving the intended dimensions as to size, &c. to the different workmen concerned, such as bricklayers, carpenters, and glaziers, they can readily execute it, and finish the whole completely, as in other buildings.—*See the Plates.*

The above kind of Stove is calculated not only as a pinery for the culture of the pine-apple, but for all sorts of tender exotics of similar quality; some requiring to be plunged in the bark-bed, others placed on the top of the flues and shelves, and others nearer the glasses; the same Stove serves also to force

fruits and flowers, &c. as already hinted.—*See STOVE PLANTS.*

Such Stoves as are intended principally for pine-apples, and for forcing flowers, strawberries, and some sorts of small culinary esculents, &c. may be only ten or twelve feet high behind, and which generally succeed better than stoves of more lofty dimensions, for the reasons already observed.

Likewise, by raising the bark-pit within wholly above the surface, elevates the plants plunged therein nearer the glasses, and proves advantageous in their growth.

As since the insertion of the foregoing general sketches of the plans and dimensions of Stoves, it having been judged expedient to give plates of the different designs, we refer the reader thereto, for a view of the several plans.

Nursery and Succession Stove.

Besides the main bark Stove above described, it is very convenient to have one or two smaller, as a nursery-pit, and a succession Stove, particularly where large collections are required, and more especially in the culture of pine-apples; one serving as a nursery-pit, in which to strike and nurse the young off-spring crowns, and suckers of the old pines for propagation; the other as a succession-house for receiving the year old plants from the nursery-pit, and forwarding them a year to a proper size for fruiting, as succession plants, to furnish the main Stove or fruiting-house every autumn, to succeed the old plants then done fruiting.

These smaller Stove departments prove materially useful in the culture of pines, particularly to raise and nurse the young plants, until arrived to a proper age and size to produce fruit; then moved into the main Stove or fruiting-house, which being thus supplied from these smaller Stoves, with a succession of fruiting plants annually, without being crowded or incommoded with the rearing of the said succession plants, proves a particular advantage, not only in the culture of the fruiting plants, as they often require a higher degree of heat than the succession plants at particular times, in order to forward and improve the growth of fruit properly; but it is also making the best advantage of this main department, to have the bark-bed always filled with fruiting plants only, producing a full crop of proper sized pine-apples every year, which could not always be effected with such certainty and perfection without the aid of these succession Stoves; because the pine-plants in their infant state require sometimes different management

from the fruiting plants, particularly in respect to the degree of fire-heat as abovesaid, which, in general, should be more moderate than for the fruiting plants, lest too much heat force them into fruit in their minor growth, when incapable of producing it in any tolerable perfection.

Therefore, these smaller succession Stoves may be erected as appendages to the main house, or may be detached at some little distance, as may be convenient; though if the situation admits, it may be both more convenient and ornamental to join them in a line with the main Stove, one at each end, and nearly of the same construction, but smaller both in length, width, and height, if thought proper; and sometimes are formed in the manner of a common detached bark-pit, without any upright glasses in front, having a wall all round, five or six feet behind, gradually sloping at each end, to about four feet in front, and with only sliding glasses at top, more particularly the nursery Stove, commonly called simply the pit, because the whole internal space in length and width is often allotted entirely as a pit for a bark-bed, without any walk within, or door for entrance, the necessary culture being performed by sliding open the glasses at top, and the flues for the fires being formed in the upper part of the back wall, above the surface height of the bark-bed: however, it may be more eligible to form the succession Stove particularly nearly like the main one, with erect glasses in front, and sloping sashes at top, with a door for entrance, and an alley or walk next the back wall at least, or more eligible if continued all round the bark-pit.

Observing, however, if these smaller Stoves are joined to the end of the main one, they may be divided from it only by a sliding glass partition for communication with each other, particularly the succession and main Stove, but with separate furnaces, and flues to each department, because the young pine plants do not at all times require the same degree of fire-heat as the older pines, especially those of proper size for fruiting; so that by having separate fires, the heat can be regulated accordingly.

The nursery Stove or pit may be of smaller dimensions, in respect to width and height, than the succession house, if thought convenient: and if designed wholly as a pit without any path or walk within, six or seven feet width may be sufficient, by five or six high in the back wall, and four in front, the whole internal space being filled with tan three feet deep to form the bark-bed: serving chiefly as

a nursery in which to strike and nurse the annual increase of crowns and suckers of the *ananas* or pine-plants the first year; also to raise many tender plants from seeds, cuttings, &c. without incumbering the main Stove; and when they are forwarded to such a state of growth as to require more room, they are removed to the succession-house.

But the succession-house may be nearly on the plan of the main Stove, though of smaller dimensions both in width and height; and is intended to receive the year-old pine-plants from the pit or nursery Stove, in order to plunge them at greater distances, sufficient to give the whole proper scope to take their full growth another year, when they will generally be arrived to a proper size for fruiting the year following: being previously removed in autumn to the main fruiting Stove to succeed the old fruiting plants, which generally by October have all yielded their produce, are then removed away, and their place supplied by a sufficient quantity of large plants from the succession-house, being arrived to a proper state of growth to produce fruit next summer: and the succession-house is at the same time replenished with the largest plants from the nursery pit, which next autumn will probably be also arrived to a proper size for removing to the fruiting-house to succeed the others, and the nursery-pit supplied with young crowns and suckers of the year, from the fruit and old plants, to strike and forward them in ready successions for the above occasions.

Thus, by having the different Stove departments always furnished with pine plants of three different stages of growth, succeeding one another regularly, i. e. the nursery pit containing the yearly crowns and suckers, the succession pit the one and two year plants, and the main Stove the fruiting plants, a constant succession of fruiting plants is thereby annually obtained, for the same individual plants never produce fruit but once; they, however, produce a plentiful supply of crowns and suckers which commence proper plants, attaining a fruiting state in regular succession.

However, in many places, the situation or convenience not admitting but of one common Stove to raise and forward the pines and other exotics, in their different stages of growth, or at least with probably the assistance only of a small detached bark-pit, or a bark and dung hot-bed under a large garden frame, to strike and nurse the yearling crowns and suckers of the pines, &c. of each year, until they are about a year old, then moved into the Stove, where, with the proper requisite culture, often

produce very good pine-apples, as well as raise many other curious exotics, and forward flowers to early bloom; also early fruit and some culinary esculents.

But having a main Stove with two smaller ones adjoining, nearly on the same plan as above hinted, we can always, with greater certainty, obtain a regular annual succession of fruiting pines in perfection.

As in most common Stoves the pine apples, being considered the principal useful exotics of that department, most commonly occupying the greater part of the bark-bed, or sometimes almost wholly, may also, generally in the same Stove, retain a plant or two of many other different sorts of similar tender and curious exotics, such that require aid of a hot-house in this country; some placed in the bark-bed as their nature may require, others upon the top of the flues, top of the bark-pit wall, and upon shelves; but in extensive and capacious Stoves, may have a larger or full collection of the various different sorts of principal stove exotics, a list of which is exhibited below, being collected into one point of view under the head *Stove Plants*; showing at once all the principal Stove or Hot-house plants, from the hot parts of Africa, Asia, America, and southern parts of Europe, now inhabitants of the English gardens, with hints for their general culture, referring to their proper genera for particulars; likewise, a list of such hardy flowers, fruits, and culinary esculents, as may be forwarded to early perfection by the assistance of these departments.

Supposing, however, the Stove or Stoves are now erected, and ready for the reception of the various plants intended; then observing of the bark Stove, that preparations must be made early in autumn, to fill the bark-pit thereof with tanner's bark to form the bark hot-bed, for the immediate reception of the tenderer kinds of plants, to be plunged therein, each in its proper pot; this kind of hot-bed being the most eligible for all kinds of Stoves or hot-houses, as by its moderate and durable fermentation, no material yet known equals it for a hot-bed; it effecting an uniform lasting heat, of a temperature peculiarly adapted to the growth of pine-apples, and many other tender exotics of similar quality.—See BARK-BED.

The autumn, about September or early part of October, is the general season for filling or replenishing the bark-pit with fresh bark or tan, that the bed may support a constant lively heat during the winter: however, the work may also be performed occasionally

in spring, or any time of the year, as occasion may require.

But for the general management of the Stove or Hot-house, and the plants thereof, see STOVE PLANTS below, in the article of their *General Culture*.

STOVE PLANTS.

Having exhibited in the foregoing head general hints of the form, dimensions, and construction of the different sorts of Stoves, and their respective uses in the culture of plants, we now proceed to a list of the principal Stove plants, or such tender exotics from the hot parts of the world, that require the aid of a Stove to preserve them in this country; and although they are separately treated of under their respective genera, yet by collecting them under one point of view, each genus, under its generical name, with the names of many of the principal species, distinguishing which are shrubby, herbaceous, and succulent, will, we presume, assist the memory in making a collection, and in referring to their respective genera for the particulars of their description and culture.

ABROMA, (*Abrama*)—Maple-leaved. (*Tree kind.*)

ABRUS, Jamaica Wild Liquorice. (*Shrubby.*)

ACANTHUS, Bear's-breech. — Shrubby, holly-leaved *Acanthus*. (*Under-shrubby.*)

ACHRAS, Sapota or Mammee-tree.—Common Sapota.—Mammee Sapota. (*Trees.*)

ACHYRANTHES, Bloody or Red Indian *Achyranthes*.—Woolly-cupped Indian *Achyranthes*.—Prickly-cupped shrubby Indian *Achyranthes*. — (*Mostly herbaceous, and the last shrubby.*)

ADANSONIA, Æthiopian Sour Gourd. (*Tree.*)

ADENANTHERA, Bastard Flower Fence.—*Pavonina*.—*Falcataria*. (*Trees.*)

ÆSCHYNOMENE, Bastard Sensitive plant.—Tree *Æschynomene*.—Grandiflorous *Æschynomene*.—Selban, or Ægyptian *Æschynomene*. (*Woody.*)

AGAVE, American Aloe.—Viviparous American Aloe.—Stinking American Aloe. (*Succulents.*)

ALETIS, Guinea Aloe.—Hyacinth-flowered *Aletis*.—Ceylon *Aletis*.—Cape *Aletis*.—Fragrant *Aletis*. (*Succulents.*)

ALOE, African Aloe. Most of the species, except the *Aloe Uvaria*, may be considered both as green-house and Stove plants; for, although they may all be wintered tolerably well in a green-house, yet, if placed in the Stove, in winter particularly, they more certainly flower.

flower annually in greater perfection (*Succulent.*)

ALSTROEMERIA, two or three species. (*Herbaceous*)

AMARYLLIS, Lily Daffodil.—Jacobæan Lily.—Mexican Lily.—Zelon Lily. (*Herbaceous and Bulbous.*)

AMOMUM, Ginger.—Common Ginger, Broad-leaved wild Ginger, &c. (*Herbaceous.*)

AMYRIS, Sweet Wood. (*Shrubby.*)

ANACARDIUM, Acajou, or Cashew-nut. (*Tree.*)

ANNONA, Custard-apple.—Netted Custard apple.—Prickly Custard apple.—Scaly Custard apple, or Sweet Sop.—Marsh *Annona*, or Water apple.—Broad-leaved *Annona*. (*Tree and Shrub kinds.*)

ANTHOLYZA, Æthiopian Corn-flag, several species. (*Bulbous.*)

APOCYNUM, Dog's-bane.—Shrubby upright Ceylon *Apocynum*, with varieties.—Climbing Dog's-bane, with varieties.—(*Shrubby.*)

ARECA, Fausel Nut Palm, &c. (*Ligneous.*)

ARUM, Wake-Robin, &c.—Ægyptian *Arum* or *Colocasia*.—Trilobate Indian *Arum*.—Tree *Arum*.—(*Two first herbaceous, the other somewhat ligneous.*)

ARUNDO, Reed.—Bamboo Cane or Indian tree-Reed. (*Ligneous.*)

ASCLEPIAS, Swallow-wort.—American Scarlet *Asclepias*, &c.—(*Herbaceous but ligneous stalked.*)

BANISTERIA, several species. (*Shrubby climbers.*)

BARLERIA, several Species. (*Herbaceous and Shrubby.*)

BASELLA, Malabar Nightshade.—Red Malabar Nightshade.—White Malabar Nightshade. (*Herbaceous.*)

BAUHINIA, Mountain Ebony.—Prickly *Bauhinia*.—Tomentose *Bauhinia*. (*Shrubby.*)

BEGONIA, Shining-leaved. (*Shrubby.*)

BELLONIA, Rough-leaved. (*Shrubby.*)

BIGNONIA, Trumpet flower.—Several species. (*Chiefly woody.*)

BIXA, Dying Metella, &c. (*Shrubby.*)

BONONIA, Tree-celandine. (*Shrubby.*)

BOMBAX, Silk Cotton-tree.—Thorny *Bombax*, or *Ceiba*.—Pentandrous, smooth *Bombax*.—Heptaphyllous smooth *Bombax*. (*Trees.*)

BONTIA, Barbadoes Wild Olive. (*Shrubby.*)

BROMELIA, *Ananas*, Pine-apple.—Common *Ananas* or Pine-apple.—Wild Pine-apple or *Pinguin*.—*Karatas*, or Acanthous wild Pine-apple.—Pyramidal *Bromelia*.—Lingulated *Bromelia*. (*Herbaceous, succulent.*)

BROWALIA, Spreading.—Upright. (*Annuals.*)

BRUNIA, Several species, either for the Stove or green-house. (*Shrubby.*)

BRUNSFELSIA, *Brunsfelsia*. (*Shrubby.*)

BUDDLEJA, American *Buddleja*.—Occidental *Buddleja*. (*Shrubby.*)

CACTUS, Melon-thistle, Torch-thistle, &c.—Greater Hedge-hog Melon-thistle, with varieties.—Mamillary, or Smaller Melon-thistle.—Torch-thistle, several upright sorts. Creeping *Cereus*, or trailing Torch-thistle.—Climbing creeping *Cereus*.—*Ficus Indica*, or Indian Fig.—Greater Indian Fig.—Cochineal Indian Fig.—Indian Fig of Curassoa.—Sword-leaved *Opuntia*.—*Pereskia*, or American Gooseberry. (*All of the Succulent tribe.*)

CALCEOLARIA, Slipper-wort. (*Herbaceous.*)

CAMELLIA, Japan Rose. (*Shrubby.*)

CAPPARIS, Caper Bush. (*Shrubby.*)

CAPSICUM, Guinea-Pepper.—Shrubby *Capsicum*, with many varieties. (*Shrubby.*)

CARICA, Papaw or Pepo-tree.—Common Indian Papaw-tree.—Posoposa, or Branching Surinam Papaw-tree. (*Tree-like.*)

CARYOPHYLLUS, Clove-tree. (*Woody.*)

CASSIA, Wild Sena.—Purgin-tree *Cassia*.—Biflorous shrub *Cassia*. (*Tree and Shrubby kinds.*)

CATESBEA, Lily-thorn. (*Shrubby.*)

CEANOTHUS, New Jersey Tea.—Asiatic *Ceanothus*. (*Shrubby.*)

CEDRELA, Bastard Cedar. (*Tree.*)

CELASTRUS, Staff-tree, two or three species for Stove or green-house. (*Shrubby.*)

CESTRUM, Bastard Jasmine, or Jasminoide.—Nocturnal *Cestrum*.—Diurnal *Cestrum*. (*Shrubby.*)

CHAMEROPS, Dwarf Palm or *Palmetto*. (*Frondose.*)

CHIOCOCCA, Snowberry-tree.

CHRYSOBALANUS, Cocoa Plum. (*Tree-like.*)

CHRYSOPHYLLUM, Goldy-leaf, or Star Apple. (*Woody.*)

CINCHONA, Jesuit's Bark-tree.

CITHAREXYLON, Fiddle Wood. (*Shrubby.*)

CLIFFORTIA, three species, for Stove or green-house. (*Shrubby.*)

CLITORIA, three species. (*Climbers.*)

CLUSIA, Balsam-tree.

CLUTIA, *Elutaria*, or Indian *Clutia*. (*Shrubby.*)

COCCOLOBA, Sea-side Grape. (*Shrubby.*)

COCOS, Cocoa-nut-tree. (*Frondose Tree-kind.*)

COFFEA,

- COFFEA**, Coffee-tree. (*Shrub-like.*)
COTYLEDON, Navel-wort.—Cut or jagged-leaved *Cotyledon*. (*Succulent.*)
CRASSULA, Lesser Orpine. (*Succulent.*)
CRATÆVA, Garlick Pear. (*Tree-like.*)
CRESCENTIA, Calabash-tree. (*Tree-kind.*)
CRINUM, Asphodel-lily.—American Asphodel-lily.—African Asphodel-lily. (*Bulbous herbaceous plants.*)
CROTALARIA, Laburnum-leaved. (*Shrubby.*)
CROTON, Tallow-tree.
DRACÆNA, Dragon-tree.
DRACONTIUM, Dragons. (*Climbers.*)
EHRETIA, two or three species. (*Shrubby.*)
ELÆAGNUS, Wild Olive, or *Oleaster*.—Thorny *Elæagnus*. (*Woody.*)
ELÆOCARPUS, one species. (*Shrubby.*)
ERIOCEPHALUS, three species, for the Stove or green-house. (*Shrubby.*)
ERYTHRINA, Coral-tree.—*Corallo dendron*, or Smooth Coral-tree.—Spinous Coral-tree.—Herbaceous *Erythrina*. (*Shrubby and Herbaceous.*)
EUPHORBIA, Burning Thorny Plant.—*Euphorbia* of the Ancients.—Canary *Euphorbia*.—Oleander-leaved *Euphorbia*.—Medusa's Head *Euphorbia*.—Tithymaloide *Euphorbia*, or Bastard Spurge. (*All Succulents.*)
FAGARA, two species. (*Tree and Shrubby.*)
FERRARIA, waved-leaved. (*Herbaceous.*)
FICUS, Fig-tree.—Sacred Fig, or Indian God-tree.—Sycamore Fig-tree.—Bengal Fig-tree.—Indian long-leaved Fig-tree.—Dwarf Indian Fig-tree. (*Tree-kinds.*)
GARDENIA, Cape Jasmine. (*Shrubby.*)
GLORIOSA, Superb Lily. (*Herbaceous.*)
GLOXINIA, one species. (*Herbaceous Succulent.*)
GOSSYPIUM, Cotton-plant.—Consists of herbaceous and shrubby species. See *Gossypium*.
GREWIA, Oriental *Grewia*. (*Shrubby.*)
GUAIACUM, *Lignum vitæ*, three species. (*Trees.*)
GUETTARDA, one species. (*Tree kind.*)
GUILANDINA, several species. (*Trees and Shrubs.*)
HÆMANTHUS, Blood-flower.—Scarlet *Hæmanthus*.—Reddish *Hæmanthus*.—Carinated *Hæmanthus*.—Ciliated *Hæmanthus*. (*Herbaceous bulbs.*)
HÆMATOXYLUM, Blood-wood, or Log-wood. (*Tree-like.*)
HELICONIA, Bastard Plantain. (*Herbaceous.*)
HELICTERES, Screw-tree.
HELIOTROPIMUM, Turnsole. (*Shrubby.*)
HERNANDIA, Jack-in-a-box-tree.—Sonorous *Hernandia*.—Oriental *Hernandia*. (*Trees.*)
HIBISCUS, Syrian Mallow.—Mutable-flowered *Hibiscus*, or China Rose.—*Rosa Sinensis*, or Rose of China.—Viscous Mallow, or Scarlet *Hibiscus*. (*Shrubby.*)
HURA, Sand Box-tree. (*Woody.*)
HYMENÆA, American Locust-tree.
HYDRANGÆA, great-flowered. (*Herbaceous.*)
JATROPHA, Cassada, or Cassava Plant.—Most of the species are Stove-plants. (*Woody and herbaceous.*)
JUSTICIA, Malabar-nut.—Hyssop-leaved *Justicia*, &c. (*Woody.*)
INDIGOFERA, Indigo. (*Shrubby.*)
IXORA, Indian Wild Jasmine. (*Shrubby.*)
KÆMPFERIA, Galangale.—Both the species. (*Herbaceous.*)
LANTANA, American Viburnum.—Trifoliate *Lantana*.—Involucrum-headed *Lantana*.—*Camara*, or Leafless-headed *Lantana*.—Prickly *Lantana*. (*Shrubby.*)
LAURUS, Bay, Cinnamon-tree, Alligator Pear, &c. (*Trees*)
LAWSONIA. (*Shrubby.*)
LIMODORUM. (*Bulbs.*)
LOBELIA, Cardinal-flower.—Plumier's *Lobelia*.—Surinam *Lobelia*.—Pine-leaved *Lobelia*. (*Shrubby.*)
LORANTHUS. (*Shrubby.*)
MALPIGHIA, Barbadoes Cherry.—All the species. (*Woody.*)
MAMMEA, Mammee-tree.—American Mammee-tree.—African Mammee-tree. (*Trees.*)
MANGIFERO, Mango-tree.
MARANTA, Indian Arrow-root.—Arundinaceous *Maranta*.—Galanga, or Indian Arrow-root. (*Herbaceous.*)
MARTYNIA.—Perennial *Martynia*. (*Herbaceous.*)
MASSONIA, Broad-leaved.—Narrow-leaved. (*Bulbs.*)
MELASTOMA, American Gooseberry. (*Trees and Shrubs.*)
MELIA, Bead-tree.—Evergreen Bead-tree of Ceylon.—*Azadirachta*, or Indian Bead-tree. (*Tree-kinds.*)
MESEMBRYANTHEMUM, (*Ficoides*) Fig Marigold.—Diamond *Ficoides*, or Ice-plant. (*Herbaceous and Succulent.*)
MESUA, Indian Rose-chestnut. (*Shrubby.*)
MICHELIA. (*Shrubby.*)
MIMOSA, Sensitive-plant.—All the species. (*Shrubby and Herbaceous.*)
MUSA, Plantain-tree.—All the three species. (*Of a Tree-like growth, and Herbaceous nature.*)
MYRTUS, Myrtle-tree.—Pimento or Allspice-tree.—Diacious Myrtle.—Brazilian Myrtle, &c. (*Tree and Shrub kinds.*)
NERIUM,

NERIUM, Oleander.—Double-flowered.—Striped-leaved, &c. (*Shrubby.*)

NYCTANTHES, Arabian Jasmine.—Sambac, or common Arabian Jasmine.—Undulate-leaved *Nyctantes*, or Malabar Jasmine.—*Arbor Triflis*, or Sorrowful-tree.—Hairy Sorrowful-tree. (*Shrubby.*)

OPHIOXYLON. (*Climber.*)

PANAX, Genseng. (*Shrubby.*)

PANCRATIUM, (*Pancratiun* lily) Sea Daffodil.—Ceylon unicolorous *Pancratiun*.—Mexican bicolorous *Pancratiun*.—Caribbean multiflorous *Pancratiun*.—Amboyna broad-leaved *Pancratiun*. (*Bulbous Herbaceous perennials.*)

PANDANUS, Screw Pine. (*Herbaceous.*)

PARKINSONIA. (*Tree.*)

PASSIFLORA, Passion-flower.—Sawed-leaved Passion-flower.—Laurus-leaved Passion-flower.—Vespertilion, or Bat's wing Passion-flower.—Red Passion-flower.—Maliformous, or apple-fruited Passion-flower.—Silky Passion-flower.—Multiflorous Passion-flower.—Quadrangular Passion-flower.—Suberosous, or Cork-barked Passion flower. (*Woody, and Herbaceous climbers.*)

PENTAPETES. (*Annual and Shrubby.*)

PERIPLOCA, Virginia Silk, &c.—Indian *Periploca*. (*Woody.*)

PETIVERIA, Guinea Hen-weed.

PHŒNIX, Great Palm, or Date-tree. (*Lignous.*)

PHYLLANTHUS, Sea-side Laurel.

PHYSALIS, Winter-cherry.—*Arborescent*, or Tree *Physalis*.—Winter-cherry of *Curaçsea*. (*Woody.*)

PHYTOLACCA, American Night-shade. (*Shrubby.*)

PIPER, Pepper, several sorts. (*Herbaceous and Shrubby.*)

PISCIDIA, Two species. (*Shrubby.*)

PISONIA, Two species. (*Woody.*)

PLUMBAGO, Lead-wort.—Ceylon *Plumbago*.—Rose *Plumbago*. (*Lignous or Under-shrubby.*)

PLUMERIA, Red Jasmine.—Red *Plumeria*.—White *Plumeria*.—Obtuse *Plumeria*. (*Woody Succulents.*)

POINCIANA, Barbadoes Flower-fence, &c.—Fair *Poinciana*, or Double-spined Barbadoes Flower-fence.—Bijugated Single-spined *Poinciana*.—Spineless *Poinciana*. (*Shrubby.*)

POLYANTHES, Tuberose, or Indian Tuberous Hyacinth. (*Herbaceous.*)

PORTULACA, Purslane. (*Shrubby.*)

PSIDIUM, Guava-tree.

PTILEA, Shrub Trefoil.—Viscous Indian *Ptelea*. (*Shrubby.*)

RANDIA, Two species. (*Shrubby.*)

RAUVOLFIA. (*Shrubby.*)

RHAMNUS, Buckthorn.—*Spina Christi*, or Æthiopian Jujube.—*Oenopia*, or Ceylon Jujube. (*Shrubby.*)

RHUS, Sumach.—Cobbe, or Ceylon Sumach. (*Shrubby.*)

RIVINIA, Dwarf Tetrandrous *Rivinia*.—Climbing Octandrous *Rivinia*. (*Lignous.*)

ROBINIA, False Acacia.—Violet American *Robinia*.—Smooth Indian *Robinia*. (*Tree and Shrub kinds.*)

RONDELETIA. (*Woody.*)

SACCHARUM, Sugar-cane.—Common Sugar-cane.—Spiked Sugar-cane. (*Herbaceous, of the arundinaceous tribe.*)

SAPINDUS, Soap-berry-tree.

SCHINUS, Indian Mastic-tree.—Molle-tree of Clusius, or Peruvian Mastic-tree.—Areira, or Brazilian Mastic-tree. (*Woody.*)

SENECIO. (*Herbaceous.*)

SIDA, Indian Mallow. (*Herbaceous.*)

SIDEROXYLON, Iron-wood.—Inermous, or Smooth Æthiopian *Sideroxylon*.—Spinous, Malabar *Sideroxylon*. (*Shrubby.*)

SOLANUM, Nightshade.—Guinea Nightshade.—Fiery-thorned Nightshade.—Bahama Nightshade.—Trilobate Nightshade, &c. (*Shrubby.*)

SOPHORA. (*Shrubby.*)

SPATHLIA. (*Shrubby.*)

SPONDIAS. (*Trees.*)

STAPELIA, Variegated *Stapelia*.—Hairy *Stapelia*. (*Succulent and lignous.*)

SWIETENIA, Mahogany-tree.

TABERNÆMONTANA. (*Shrubby.*)

TAMARINDUS, Tamarind-tree. (*Tree.*)

THEOBROMA, Chocolate nut-tree.—*Cacao*, or Chocolate-nut-tree.—*Guazuma*, or Bastard Cedar of Jamaica. (*Shrub and Tree-kind.*)

TINUS. (*Tree.*)

TOLUIFERA, Balsam of Tolu-tree.

TOURNEFORTIA, Shrubby *Tournefortia*.—Volubillate, or Twining *Tournefortia*.—Fœtid, or Stinking *Tournefortia*.—Hairy *Tournefortia*.—Serrated *Tournefortia*.—Cymose *Tournefortia*. (*Shrubby.*)

TRIUMFETTA, Lappula, or Burry-capuled *Triumfetta*. (*Lignous.*)

TULBAGIA. (*Herbaceous.*)

TURNERA, Elm-leaved. (*Lignous.*)

VERBENA, Vervain. (*Herbaceous.*)

VINCA, Periwinkle.—Rose Periwinkle of Madagascar. (*Shrubby.*)

VITIS, Vine.—Indian wild Vine.—Trifoliate Indian Vine. (*Shrubby.*)

VOLKAMERIA, Prickly *Volkameria*.—Unarmed or Smooth *Volkameria*. (*Shrubby and Under-shrubby.*)

URENA, Angular-leaved *Urena*.—Sinuated *Urena*.—Procumbent *Urena*. (*Woody.*)

WALTHERIA,

WALTHERIA, American *Waltheria*.—Indian *Waltheria*.—Narrow-leaved *Waltheria*. (*Ligneous*.)

XIMENIA, American Prickly *Ximenia*.—Unarmed Jamaica *Ximenia*. (*Trees*.)

XYLOPHYLLA Love-flower.

ZAMIA, Dwarf American Palm. (*Fron- dose*.)

Of the above list of Stove plants, some of the sorts are also inserted in the green-house list; because, in default of a Stove, they may be preserved tolerably well in a good green-house, though probably brought to greater perfection in a Stove, as is generally noticed in the culture of the respective sorts, each in its proper genus.

General Management.

As to the general management of the bark Stove and culture of the plants; the pit of the Stove must always be filled with tan-bark to produce a continual heat, making fires only in winter, &c. and all the plants must be kept constantly in pots, in order to move to different situations in the house occasionally, some in the bark-bed, others on the shelves, top of the flues, &c.

But to prepare the Stove for the reception of the plants, the bark-bed must be formed by filling the pit with new tanner's bark early in autumn, or any time else when the most convenient to obtain the plants.

The tan-bark for this purpose is procured from the tan-yards, after having been used in tanning, and cast out of the tan-pits; choosing that which is fresh, not having lain long to exhaust itself, or become black and earthy; but the frether it is from the tan-pits the better, especially after having lain a short time to drain off the grossest wet, preferring the larger or middling sort to the small-cut bark, which soon becomes earthy and declines its fermentation; but the larger sort will retain its heat several months: having however obtained the proper quantity, generally observe, previous to applying in the pit, if it happens to be very wet, it is advisable either to spread it abroad, or dispose it in small heaps or ridges, two or three days in dry weather, to drain and dry moderately: or if copiously wet, may be formed into a general heap to drain off the redundant moisture more effectually, and promote its fermentation; and in a few days, or perhaps a week or more, it will be in good preparation for use; then fill it into the bark-pit, being careful as it is thrown in, to shake it up well together with the bark fork equally in every part, not beating or treading it down, raising the whole half a foot above the top of the pit to allow for settling, suffering it to set-

tle gradually of itself; and thus the fermentation will come on regularly, perhaps in a week or ten days; though may probably be a fortnight or more, before it becomes of a due temperature for the reception of the plants; having some long sticks thrust into the bed, drawing them up daily, and feel them with the hand, you will more easily discover the progress of the fermentation, and proper degree of heat; observing, if the heat should prove violent, to defer plunging the plants till it is become of a more moderate temperature.

When therefore the bark-bed is ready, prepare to plunge the plants, such as pines and other exotics that require the aid of the bark-bed; and the other less tender kinds, to be placed in different parts of the house as their nature may require; all the sorts being previously planted in pots.

In potting the different kinds, allot proper sized pots according to the size and nature of the plants, not too large at first, for as they advance in growth they may be shifted into others a size larger, &c.

Being careful also, to pot them in proper earth adapted to the nature of the respective sorts; though most of the shrubby or woody kinds, and the common herbaceous tribe, succeed in any common rich light earth; but all the succulent plants should be planted in a dry, sandy, or rubbishy soil, on account of their humid quality; however, as to the different soils requisite for any particular sort, it is exhibited in their culture under their respective heads.

In proceeding to plunge the pines and other sorts intended in the bark-bed, it is proper to have a broad plank or board to lay across the bed, on which to stand or kneel without treading the bark hard; likewise a hand-fork for opening apertures more expeditiously to plunge the pots, which may be plunged to their rims, if the fermentation is not too violent; otherwise only about half-way at first; afterwards, when the heat is moderate, plunge them wholly down; arranging the plants regularly in respect to their different gradation of height, the tallest behind, gradually down to the lowest in front; and if disposed in the quincunx way, they will receive the advantage of more room, and benefit of the air and rays of the sun more equally, plunging the whole as above observed; and at the same time, let all the other less tender kinds of plants, not requiring to be placed in the bark-bed, be disposed in different parts of the house, as their temperature may require; many of the woody and herbaceous kinds succeed well enough any where within the Stove; but most

of the succulent tribe succeed best in the driest part near the flues, distant from moisture, especially in winter, being placed either on the top of the flues, or on shelves ranged above them, or in other parts where convenient; though almost any sorts of Stove plants, when intended to forward them faster in growth, or into bloom, may be plunged in the bark-bed occasionally; however, as to the *ananas* or pine-apple, although they will grow in any part within the Stove out of the bark-bed, yet never so prosperously, nor produce any but small trifling fruit, therefore require to be continued always plunged in the bark-bed the year round; several other of the more tender curious exotics, mentioned in their respective genera, are also the most prosperous if plunged in the bark-bed, where there is room enough without incommoding the pine-plants.

Observe, if, after the plants are plunged in the bark-bed, the bark should happen to heat violently, it is proper to draw up the pots half way, or far enough to save the roots of the plants from being by vehemence of the heat damaged, replunging them again down to their rims when the heat becomes more moderate.

Most of the Stove plants require to be continued almost constantly in the Stove the year round; though, if the Stove is much crowded, some of the less tender kinds will bear to be almost fully exposed to the open air, six weeks or two months in the heat of summer, in warm dry seasons; at least, may remove some into the green-house or under frames, &c. towards the latter end of June, or beginning of July, if thought convenient to thin the Stove on any particular occasion: the green-house being then vacant, and in which these hardier Stove plants may enjoy the free air more copiously to promote strength, by opening all the windows daily, yet be sheltered on nights and bad weather; which would change the colour of their leaves disagreeably; removing them however into the Stove again early in September, or as soon as the nights prove cold; however, if plenty of Stove room, the whole may be constantly retained in that department.

The Stove must always be kept nearly to a certain regular temperature of heat as marked on the botanical thermometer (*ananas*); observing that in summer, from May until October, the bark-bed heat alone, aided by the heat of the sun through the glasses, will sufficiently warm the internal air: but from October or beginning of November, to April or May, aforesaid, the additional assistance of

and support a due warmth in the internal air nearly equal to that in summer; by making fires every evening and morning in the furnace of the flues, also occasionally on days in very cold, or foggy, and damp weather, and rigorous frosts without sun.

But as a guide to regulate the degree of heat requisite for Stoves, especially in winter, a Stove thermometer should be placed in a convenient situation within, not too near the fire-place or flues, but hung up towards the centre of the house, with the back to the sun, so as the mercury or liquid spirit in the glass globe and tube may be affected only by the warmth of the air internally; thereby discovering the real degree of heat more effectually, which should always be so regulated, as not to exceed five or ten degrees over or under the mark *ananas*, which, as we noticed before, is the standard generally to be observed in regulating the temperature of Stove heat at all seasons.—See THERMOMETER.

Fresh air must be admitted into the Stove occasionally at all seasons, for the benefit of the plants in general, by sliding some of the front or top glasses open in sunny days, more or less, according to the season and temperature of the outward air, &c. observing, however, that in winter and early spring, air must be admitted but sparingly and cautiously, only at favourable opportunities in fine calm sunny days, opening only some of the glasses a little way in the heat of the day, for two, three, or four hours, as the weather permits, shutting all close timely in the afternoon or sooner, if the air changes cloudy or very cold; but in summer admit air more freely every warm day, and in hot sun-shine weather especially, should slide some of the lights open pretty considerably, in the greatest heat of the day; being however careful at all seasons, to proportion the admission of free air judiciously, both as to time and quantity; not opening too soon in the day, before the sun has some power of heat; but in winter, or during the cold season, give air only in calm sunny days from about ten or eleven of the forenoon, till two or thereabout, or not so long if the weather changes; and in summer, from eight, nine, or ten in the morning, till three or four in the afternoon, or an hour or more earlier and later in very hot weather; remarking in general, that in giving air at all times of the year, to slide the lights open only a little at first in the morning, and as the heat increases, towards noon, admit a larger portion of air, according to the season; but when the sun or heat of the day is on the decline, shut the glasses close in proportion, having

also.

also particular attention to shut all quite close in due time, at the approach of the weather proving unfavourable, more especially in winter, &c. and always timely in the afternoon, before the warmth of the inclosed air falls too much below its due standard; generally observing the degree of heat on the thermometer.

Watering the plants in Stoves is also a material branch of culture to be performed, according as the different sorts require, which must always be applied more seldom and sparing in winter than in summer; remarking, the woody or shrubby plants, and most of the herbaceous tribe that are not succulent, require water frequently; the woody kinds require it most frequent, the herbaceous plants in a middling degree, and the succulents the least of all; so that the woody and common herbaceous plants, in this department, require watering, some perhaps two or three times a week in summer, and in winter, probably not above once a week; but you will regulate this accordingly, as you observe the plants stand in need: and, by the earth in the pots, being more or less dry, always apply the necessary waterings with due moderation, just to preserve the earth in the pots moderately moist, but never too wet; giving also at times occasional waterings all over the heads of the plants, in summer particularly, though but very sparingly in winter, especially to the *ananas*, *aloes*, and other exotics of similar growth; as the water would lodge long between the leaves of these sorts of plants, at this season: nor must it be practised to the pines when in flower. But as to the succulent tribe, they being naturally very replete with moisture, need but very little water at any season, more particularly in winter; except where the soil in the pots dry very fast, when a light watering now and then will be eligible; but in hot sunny weather in summer, frequent light waterings, to these kinds, is also necessary.

But in watering such of the woody plants, &c. as are apt to contract filth or insects, it is proper to water also all over their branches and leaves occasionally, at almost any season when the case requires it.

For the purpose of watering these plants, in winter particularly, a cistern or tub placed either in one corner of the Stove, or under cover of the shed behind, &c. near the fire-place, would be convenient to contain water some hours, or a day or two, previous to the using it, just to take off the chilling cold.

Likewise, for the convenience of watering

the pines and other plants plunged in the bark-bed, where they are crowded close, a tin pipe made with two or three joints or pieces, to join into one another to lengthen or shorten at pleasure; one of the pieces having a funnel fixed at one end, so that by pouring the water into the funnel, may conduct it to any pot in the bark-bed, &c. without wetting the hearts of the plants, which, in the pines, is to be avoided as much as possible in winter, and when they are beginning to show fruit.

The bark-bed will support a good growing heat three or four months, and if in that time the heat is much decreased, the pots being taken up, and the bark then forked over to the bottom, breaking all lumps, and mixing the parts well together, immediately replunging the pots, the bed will renew its fermentation, and continue in a proper temperature of heat six weeks, or two months longer, or more. Then about March or April, its strength being considerably exhausted, and probably have become earthy towards the top and sides, prepare to revive its declining heat by the addition of about one third at least of fresh tan, previously removing the pots, then clearing out all the most earthy or crumbly old tan at top, and a little down the outsides of the bed; then introduce as much new as will fill up the pit again, and then fork up the whole, new and old together, plunging the pots again as before; and thus by turning up, loosening and mixing up the old, and incorporating the supply of fresh tan, it will soon promote a fresh fermentation, and renew the heat so effectually, as to continue it in good order till autumn; at which time, not later than September or October, or probably, not longer than the middle or towards the latter end of July, or beginning of August, when, if the heat is much declined, it may be proper to revive it, by taking up the pots, and forking over the tan-bark again to the bottom; or previously observing that, as it may probably be necessary, on some particular occasions, to add a small refreshment of new tan, this, if thought expedient, should be provided accordingly, in proper time, applying and working it up with the old, either wholly or half-way down, which will revive the heat sooner, and more effectually to continue it in a proper temperature till October; or however, in default of fresh tan, it may be proper to fork up the old, to recruit its declining heat as well as possible; though the revival of the heat in the above season, (July or August), with some addition of new tan applied to the old bed, is then generally

rally more essentially necessary at the time of shifting the succession pine plants, in order to have a more lively or moderately-brisk heat about the roots when replunged after shifting; whereby to expedite and promote their fresh-rooting-freely and more effectually.

And thus by either or both the above methods, the bark-bed supporting a proper heat till October aforesaid, then as the general old bark will be in a manner quite exhausted, both in substance and its fermenting property, it should be almost entirely renewed with a fresh quantity of new tan; which should be provided in proper time accordingly; but previous to this augmentation, observing, if the old tan is not entirely wasted to a small earthy substance, it may be skreened, to separate the small exhausted materials from the larger unexhausted bark, clearing out all the small stuff that passes through the skreen, the larger remaining in the pit; then add to this as much fresh tan as will fill up the pit to the top, at the same time forking up the whole, new and old together; though if the whole of the old tan is become very small and earthy, it should be cleared entirely out, and fill the pit wholly with fresh new tan.

But for more particulars respecting these bark hot-beds, see BARK BEDS.

And as to fire-heat for the Stove, this is required only in winter and spring, as before observed, to expel the cold and damps, and support the heat of the internal air in a due temperature, as the bark-bed heat alone is not sufficient in those cold seasons; generally beginning to make the fires moderately in the middle or towards the end of October, or beginning of November, when cold or dark foggy weather commences, making gentle fires every night, and cold mornings; and as the cold increases, strengthen the fires in moderation; and in very severe, or cold damp foggy weather, continue the fires also occasionally on days, being always cautious never to make them too violent, but to as to produce nearly a uniform heat in the internal air, as marked on the thermometer; and thus continue the aid of fire-heat till about April or May, according to the temperature of the weather.

The firing for the Stoves may be either coal, wood, peat, or turf; but where coal can be easily obtained at a moderate expense, I should prefer it for general use, as being the most steady, regular, and durable fuel, requiring less attendance than any other; but in default of this, wood, peat, or turf is used in many places.

In winter, when the frost happens to prove very severe, it is advisable to cover the glasses

of the Stove every night, at top particularly, to protect the plants, either with shutters, canvas rollers, or large garden-mats, &c. as formerly mentioned, which covering may also be used in the day-time occasionally, if the frost continues extremely rigorous and no sun appears; but by no means continue the day-covering to darken the plants longer than it shall appear absolutely necessary.

And in the heat of summer in very hot sunny days, it may sometimes be proper to afford a moderate shade of mats, over the top glasses, to some particular plants, for an hour or two, during the violent heat, lest the sun, shining vehemently through the glasses, should scorch the leaves or burn them in holes, and prove detrimental to small tender plants.

Shifting the plants into larger pots, and fresh earth occasionally, must also be duly attended to.

Accordingly, therefore, as the different plants in the Stove increase in growth, and require larger pots, they should be shifted into others a size larger; which may be requisite to some plants annually, such as the pine-apples, and other free growing exotics; others once in two or three years, and some not so often; such as some of the smaller slow-growing succulents, &c. though most sorts of plants in this department will either require shifting or fresh earthing more or less every year or two; either in the same or larger pots, as their growth may require.

The general season for performing these works of shifting or fresh-earthing is either in the spring, about April or May, or early part of autumn, as August, or the beginning of September, time enough for the plants to strike fresh root, in the newly added earth before winter; though if any particular plant stand in great need of shifting, or is in a bad state of growth, the shifting may be performed almost at any season of the year, chusing however, principally, the spring or autumn, as abovementioned, for any general shifting.

In performing the shifting, generally preserve the ball of earth entire about the roots, unless the roots are supposed to be in a decayed state, when all the old earth may be cleared away, and the roots trimmed as occasion require; but those removed with the entire ball, should only have any very dry mouldy and matted roots round the sides and bottom of the ball trimmed off, together with a little of the old earth, if it can be done without disturbing the ball; then having the new pots and fresh compost ready, placing pieces of tile or oyster-shell over the holes in the

the pots; and some fresh earth at bottom, set in the plant; and fill up round the ball or roots with more new mould, almost to the top of the pot, giving directly a moderate watering to settle the earth close; and thus proceed, plant and plant, till finished, returning each to its proper place again; plunging all the pines in the bark-bed, and also as many of the other plants as room will admit, which will forward their striking or rooting more quickly in the new earth: after which the less tender kinds may be removed to the shelves, &c. in any part of the Stove.

Such plants, however, as do not require shifting annually, may be fresh earthed at top, &c. in spring, previously removing some of the old earth from the top, and a little way down round the sides of the pot, then replenishing with an equal portion of fresh mould, will prove very beneficial culture, finishing each with a very moderate watering to settle the earth.

It is of importance in the Stove culture to keep all the plants clear from decayed leaves, by removing all such as soon as they appear, as it both tends to preserve the beauty and health of the plants.

Likewise, it is of consequence to keep all plants confined in Stoves clean from dust and filth, which most sorts are apt to contract by such confinement, often to their great prejudice if not timely cleaned; this may sometimes be effected in some sorts, by now and then watering the plants all over their heads, which will wash off any loose dust, and give the plants a lively healthful appearance; though, where any is very foul, is advisable, in the larger broad-leaved kinds particularly, to wash the leaves thereof, leaf and leaf, with a sponge and warm water, also the stems and branches wheresoever any filth is contracted; but as to the pines in particular, and the *aloe* kinds, and others of the like growth, should not be watered all over in winter, because in that season the water is apt to lodge between their leaves a long time, so should only wash their leaves, when foul, with a wet sponge tied on the end of a small stick; for cleanliness contributes exceedingly to the prosperity of the plants; dust or any filth being suffered to increase considerably, is apt to clog and obstruct the fine necessary organs of perspiration, as well as the absorbent vessels destined to imbibite the humidity of the air; thereby cause a stagnation of the sap, and the plants assume a sickly state, and often become the prey of insects: it is therefore essentially necessary to keep all these plants as clean as possible, as it

certainly conduces very considerably to their health and beauty.

Insects often infest the plants in Stoves, and sometimes prove very destructive to some sorts, particularly the pine-apple; appearing first like mildew, or scurfy, and soon after assume the appearance of lice, &c. The causes of them are variously assigned; some impute it to uncleanness and bad state of health, others to the dry air of the Stove, unavoidably occasioned by the fire-heat, and others to the bad management of the plants; though it is certain we shall often also see plants that are seemingly healthful and well managed, suddenly attacked with insects, and more particularly the pine-apples, aforesaid: and when this happens, the plants assume a sickly appearance, requiring immediate assistance in our endeavours to clear them from the vermin as well as possible. As, however, this disaster of insects is ascribed to several causes, so are several methods proposed for the abolition of them; sometimes, previously with a small, pencil-shaped bristle brush, or a sponge, and impregnated water, as intimated below, brushing the leaves with the former, and washing them with the latter, clean to the bottom and heart of the plants, as far as they admit; the washing them is occasionally affected with the infusion of tobacco, &c. i. e. water impregnated with tobacco stalks, tobacco dust, flour of brimstone, and foot, &c. and with this wash the leaves, stalks, and branches; or sometimes also by dipping or plunging the head of the plant wholly into a tub of the above impregnated water, likewise strewing tobacco dust over the leaves and other parts: others try the effect of fumigation of tobacco, by means of a pair of bellows made for that purpose, furnished with a large tin or brass tube to screw on the nozzle of the bellows at pleasure, the extreme end terminating in a long pipe, and the tube being filled with tobacco set on fire; then by blowing the bellows, it produces a strong stream of smoke from the pipe, which being directed to the parts of the plants infested with the vermin, many of them are sometimes thereby effectually exterminated; various other remedies are also occasionally applied, such as compositions both of a powder and liquid kind, to destroy these Stove insects; also receipts to be sold for preparing such a composition, pretending to be of infallible efficacy: though I never found the application of them thoroughly effectual.

In the whole it may be said, that prevention is preferable to a cure, by endeavouring by proper culture, to preserve the plants in a healthful

healthful state of growth, which contributes exceedingly to the prevention of insects; or observing, however, that previous to the application of the above remedies to destroy the insects, it is of importance to keep the plants always clean from filth, the bark-beds always of a lively growing warmth, to continue the plants in a free growth, and keep the earth in the pots of a middling degree of moistness by due moderate waterings, sprinkling the tops also now and then as before observed; those, however, of the pines only in summer, for the reasons before given; supplying also proper share of fresh air in proportion to the season of the year, and temperature of the weather; and being particularly careful never to have the fire nor bark-bed heated too violent, which, affecting the plants, occasions a sickly stunted growth promotive of insects; applying also, if needful, any of the other remedies that may be thought the most efficacious. Likewise if, after all, any particular plant remains severely attacked, and rendered of a very sickly weak state by the vermin, it is advisable to shift it into a new pot and wholly fresh earth, and plunge it into the warmest part of the bark-bed, or other good hot-bed under glasses, still using also the other means; and thus the plant will likely assume a free growth, and recover its proper health and vigour.

Thus far is principally the general management of a Stove, and culture of the plants at large; and as to the method of propagating the various sorts, and of any peculiar culture and other occurrences of particular species, &c. we refer to their respective genera for explanations on those heads.

A list of hardy plants, &c. for forcing in Stoves, and general culture.

As we have already observed, that besides the tender exotics which require the constant aid of the Stove, many hardy plants, both herbaceous, shrub, and tree kinds, may be occasionally introduced into the Stove, in order for forcing to early perfection when required.

For instance, various hardy herbaceous flower-plants may be forwarded into bloom in the Stove, long before their natural season in the open ground; such as early dwarf tulips, hyacinths, polyanthos-narcissus, jonquils, and many other narcissus kinds; anemones, ranunculus, and almost any other of the more curious sorts of bulbous and tuberous flower-plants that may be required early in bloom; previously planting the roots in pots, or some in water-glasses, either at the time it is intended to place them in the Stove, or rather in the preceding autumn, in October or No-

vember, especially in pots, and place them in a garden frame, &c. to be sheltered only from frost till the time arrives for placing them in the Stove, which may be almost any time in winter, though, if not till towards Christmas or after, we may expect a stronger and finer bloom; placing them upon shelves towards the glasses: or if required to have some of them flower as early as possible, may plunge the pots into the bark-bed; supplying all the sorts duly with water, especially after they begin to shoot; and they will here grow freely without trouble, and produce their flowers both early, and in very good perfection.

Likewise pots of pinks, carnations, sweet-williams, wall-flowers, stock-gilliflowers, &c. being placed in the Stove in January, February, or any of the early spring months, may be forwarded considerably in flowering; also many other fibrous-rooted perennials of small moderate growth, that may be required early in flower. Likewise in the Stove may be raised many of the curious annual flowers early from seed, and forwarded to an early bloom.

Of esculent herbaceous plants, may raise early kidney beans and cucumbers in great perfection in the Stove; the seed, &c. being sown in pots or boxes of rich dry earth any time in winter or early spring, placing those of the kidney-beans any where in the house, and the cucumbers near the top glasses upon shelves, just over the back wall and flues; may also raise small sallading any time in winter, sown in boxes or large pots, &c. likewise strawberries, the plants being trained in the open ground in the garden to a bearing state, generally of the Alpine and Scarlet sorts, (see FRAGARIA) such as have either been planted young in pots singly and remained a year, or till advanced to a proper growth for bearing; or good bearing plants in the full ground, taken up and potted with balls of earth about their roots early in autumn, or even in winter whilst the weather continues open, and, in either method, the pots of plants, placed in the Stove near the glasses any time from January till March, either all at once, or at different times for succession, they will produce plenty of fine strawberries. I have also forced early asparagus in the Stove, when there has happened to be a vacancy in the bark-bed to admit of plunging the plants in the tan, as directed in forcing them by dung hot-beds, under the article ASPARAGUS.

As to flowering shrubs, if an early bloom is required, many desirable sorts of small or moderate growth may be forwarded considerably in the Stove; such as roses, honeysuckles, syringas,

syringas, Persian lilacs, hypericum, jasmynes, and various other principal sorts that have merit in the beauty or fragrancy of their flowers; the plants being previously potted, may be placed in the Stove in winter, or any time from January till February or March, &c. either in a common pine-apple Stove, or a forcing Stove; they will flower freely a long time before their natural season.

And as to the fruit-tree kinds, several sorts may be fruited very early in the forcing Stove particularly, especially most of the stone fruits, and some of the berry kinds; such as cherries, peaches, nectarines, apricots, plums, grapes, and figs; also gooseberries, currants, raspberries, &c. all of which being previously trained in the open ground to a bearing state, then planted in the Stove; or some in pots to move to the Stove occasionally, beginning to force them any time in January, or early in February; some being planted finally in the ground or border of earth formed within the Forcing Stove; others in pots, particularly some of the dwarf cherries, and peaches, &c. and smaller fruit shrubs; but the principal peaches, nectarines, apricots, plums, vines, and figs, should generally be planted against a treillis erected near the back and front, to be trained as wall-trees; also some of the early May and duke cherries; though cherries generally succeed very well in small standards, half standards, and dwarfs; pruning them generally to moderate heads, that they may not become high or spreading, to interfere with each other, or shade the other trees too much. Vines also in particular, may likewise be planted in the open ground against the outside of the front of the Stove, and their stems trained in through holes made in the wall or timber framing; and the branches within trained up thinly against the slope and end sashes, &c. to slight treillis work fixed to the bearers, so as the sashes have full liberty to slide; observing such vines as are thus trained in from the outside of the Stove, should in winter, when severe frosts prevail, have that part of their stems without, defended by a close wrapping of hay-bands; also the ground over their roots, especially towards the time the vines begin to shoot within-side of the Stove.

Remarking, as to the time to begin forcing by fire-heat the above hardy plants and fruit-trees, that, if in a forcing Stove for the purpose, January or beginning of February is the proper season; then shut all the glasses close, except giving air occasionally as hereafter hinted; making the fires moderate at first, increasing their strength gradually, though always in a moderate degree, rather under, but

never above the temperature of the pine-apple standard, continuing the fires every night and morning in the above moderate manner; also occasionally in the day time, in severe frosts or cold damp weather.

If, however, there is only a common pine-apple Stove for general use, it should be observed that its temperature of general heat is rather too strong for most fruit-trees, except vines: may, however, where room, introduce some small dwarf sorts in pots; several other kinds of hardy plants may also be admitted in this Stove for forcing, having them ready in pots, &c. in order that they may be moved into the Stove only at the proper season; or, to have a regular succession, may introduce them at two or three different times, at a fortnight or three or four weeks interval, having plants, &c. for this purpose ready potted, and in winter placed under occasional shelter from frost, till placed in the Stove.

All the plants thus forced in the Stove must be allowed the benefit of fresh air in fine days, and occasionally waterings; as to fresh air, if in a common pine-apple Stove they can only enjoy the advantage of air in common with the other plants in that department, as directed in the culture of Stove plants: but if they are in a forcing Stove by themselves, fresh air may occasionally be admitted more freely, especially after the plants have begun to shoot; chusing, however, only fine mild sunny days for this, by sliding open the lights a little in the heat of the day; increasing the portion of air as the warm season advances, shutting all close towards evening: and as to water, all the plants, both herbaceous kinds, shrubs, and trees, will require occasional moderate waterings; those in pots will require it more frequent than such as are planted fully in the ground: chusing generally warm sunny weather for this work, especially in winter and early spring; and give it always in due moderation.

As soon as these forced hardy plants are past perfection, either as to flowering or fruiting, &c. those of them you intend preserving for future use, and that are in pots, should be moved into the open air, to recover themselves, as some of them may serve for the open ground, and some also to force again after having a summer's growth in the full air, especially the shrub and tree kinds; and as to such as are planted in the full ground in forcing Stoves, should, as soon as the flowers and fruit are past, be fully exposed to the open air, by removing all the glasses, that they may receive the full advantage of the air, showers, dews, &c. all summer, and until nearly the arrival of next forcing season, that they may regain proper

proper strength and vigour to yield their produce in due perfection the following year; observing towards winter, or at the approach of sharp weather, to put on the glasses again, in order to give occasional shelter till the time to begin forcing, and then the Stove must be shut up close, and managed as before.

According as any of the fruit-trees fail, or become bad bearers, let them be removed in due time, and their place supplied with new ones from the nursery.

STRELITZIA. (*Strelitzia*.)

This genus furnishes the Stove with a singularly-curious and superbly-beautiful herbaceous perennial exotic from Africa; rising with large oval-oblong leaves, and upright flower-stems, terminated each by a long spatha or sheath, protruding several elegant orange-coloured flowers, having curiously-beautiful nectariums.

Class and order, *Pentandria Monogynia*.

Characters.] CALYX, a terminal, monophyllous, channeled, declining spatha, involving the base of the flowers. COROLLA, deeply divided into three oval lanceolate acute segments, slightly carinated, including a triphyllous nectarium involving the fructifications. STAMINA, five filiform short filaments arising from the base of the nectarium, topped with long linear antheræ. PISTILLUM, an oblong-obtuse three-cornered germen, under the corolla; a single style the length of the stamina, crowned with three subulate stigmas, joined to the top of the nectarium. PERICARPIUM, an oblong blunt leathery capsule, slightly three-angled with three valves, and containing many seeds.

There is but one species of this magnificent flowering perennial: grows naturally in the interior parts of Africa, and towards the Cape of Good-Hope, from whence it was first introduced in this country.

The species is,

STRELITZIA *Regina*.

Queen's Strelitzia.] Hath a perennial stringy root, from whence arise a number of leaves standing upright on radical footstalks thrice their length, and furnished at bottom with a sheath; the leaves are about a foot in length, and four inches broad; they are oval-oblong, leathery, rigid, smooth, concave, entire on the edges, except on one side; towards the base they are more or less curled, the upper side is of a deep green, and the under covered with a fine sea-green meal; the midrib is yellowish and hollowed above, with veins prominent within side, and the young leaves are rolled up. The flower stem, a little taller than the leaves, is unbranched, proceeding from the sheath of one of the leaves; it is straight,

upright, and round, of a glaucous hue, covered with four or five sheaths which closely embrace it, two or more stems arising from the same root; the flower stem is terminated by a declining sheath about six inches long, of a bright purple at its base, running out to a long point, opening above the base to within an inch of the apex, and contains five or six flowers, these are of a bright orange colour, and become upright when protruded from the spatha; the corolla is deeply divided into three leaves slightly keeled with their base fleshy and white; the nectarium is of a very singular form, composed of two fine azure-blue petals, the upper one short and broad, with a whitish point, the sides of which lap over the base of the other petal; the inferior petal is about two inches and a half long, the lower half triangular, grooved on the two lowermost sides, and keeled at bottom, the keel running straight to its extremity, the upper half gradually dilating towards the base, gives it an arrow-shaped form, bifid at the apex, hollow, and containing the antheræ, the edges of the duplicature forming a kind of frill from the top to the bottom. The whole flower is succeeded by a blunt three-cornered capsule, containing many seeds.

This curious plant is raised from seeds imported from the Cape of Good Hope, as we have not heard of any ripening in England, though, when the nature of the plant is better understood, it is hoped it will be so managed as to produce ripe seeds here; the seeds must be sown in pots of rich earth, and plunged in a hot-bed to get them up, afterward must be transplanted singly in pots, and plunged in the tan-pit of the Stove; observing, when the plants are large enough for blowing, to let their roots have plenty of earth, so they can extend themselves into the rotten tan, which will greatly promote their blowing.

STROBILUS, a species of seed-vessel commonly called *Cone*.

The *Strobilus* or *Cone* (*Conus*) is the fruit or seed-vessel of the coniferous or cone-bearing trees, such as pine, fir, cypress, cedar, juniper, &c. being of a conical figure, formed of a conic *amentum*, composed of scaly imbricated calyces, becoming so many hard woody scales, laid over on one another like tiles, closely involving the seeds. See CONIFERÆ and CONUS.

This species of seed-vessel being generally of a conical form, is commonly called a *Cone*, (*Conus*.)

STYLUS, the Style of the flower.

The Style is that long slender part of the *pistillum* placed on the top of the germen, in the centre of the flower, elevating the stigma or

or summit of the *pistillum*, or female organ; and is corresponding to the vagina in animals, as being the tube through which the effluvia of the farina or fertilising male dust of the antheræ emitted on the stigma, pass to the germen or seed-bud, for the impregnation of the embryo seeds. See PISTILLUM, GERMEN, and STIGMA.

Every female and hermaphrodite flower is furnished with a *pistillum*, and consist of three parts, viz. the germen, Style, and stigma; the germen supports the Style, and the Style the stigma on its summit. Thus the Style connects the germen and stigma; and in plants apparently without, or with but a very short Style, the stigma is placed on the germen; as in *papaver*. The number of Styles vary in the plants of different genera, the greater number having only one Style, others two, three, to five, ten, or many Styles, which in each flower is generally equal in number to that of the germen or seed-bud, each germen being furnished with its own particular Style; so that flowers having but one germen have generally but one Style; and those with two, three, or many germens, have the like number of Styles. There are, however, some exceptions, as there are plants which have more than one Style for a single germen or seed-bud, as in the umbelliferous tribe; others on the contrary have a single Style common to many seed-buds, as in the verticillate tribe of lip flowers. And in another tribe of plants the Style is single at its origin, but soon divides or branches out into as many ramifications as there are divisions or cells in the cavity of the seed-bud, such as in the geraniums and mallow tribe, which have their Styles divided above into five branches, corresponding to the five divisions of the seed-bud or capsule.

From the number of Styles, and in their absence that of the *stigmata*, is founded the orders or secondary divisions of the classes in the sexual method. See CLASSES and ORDO.

The Style in most plants is erected like a column in the centre of the flower; in some, however, the Style is nodding or reclined, or in others is revolute or bent backwards; and sometimes, as in *nigella arvensis*, the five Styles being longer than the stamina, are first erect; afterwards when the flower is fully expanded, they are bent back, that the stigmas may touch the antheræ of the stamina or male organ, and having thereby received the male dust, they are again elevated, and ever after remain erect. For the most part the Style is always surrounded by the stamina, so that some of the pollen or male dust of the antheræ is blown by the wind on the stigma.

As to proportion and dimension, the Style is either of equal length with the *stamina*, as in most flowers; much longer, as in some others; and in some very short, or even wanting, as in *papaver*, &c. in which the stigma fits close to the germen; and in substance the Style in some plants is thicker than the *stamina*; in others of equal thickness, and in some slenderer.

As to figure, the Style is either cylindrical and hollow like a tube, as in most plants; angular, as in *cana*; awl-shaped or tapering, as in *geranium*; capillary or slender, like a hair; or club-shaped, being thicker above than below, as in *leucoium*, the greater snow-drop, &c.

In point of situation, the Style is situated either on the top of the germen, as in most flowers; above and below the germen, as in *capparis* and *euphorbia*; or on one side of the germen, as in rose, raspberry, and other plants of the *icosandria polygynia*; or on the base of the germen, as in *alchemilla*, or lady's mantle, &c.

In respect to duration, the Style is either deciduous, falling off with the other parts of the flower, after the impregnation, as in most plants; or sometimes permanent or abiding, as in the cruciform flowers of the *tetradynamia*.

STYRAX.

Storax, or Sweet Gum-tree.

It is a deciduous aromatic tree of the East, retained in our gardens to diversify the greenhouse and shrubbery collections; is famous for its medical gum called Storax, being a fragrant resinous fluid, which the tree imparts by incision in the trunk; the very wood also imparts a sweet odour.

Class and order, *Dodecandria Monogynia*.

Characters.] CALYX is short, cylindric, monophyllous, and quinque-dentate. COROLLA is monopetalous, infundibuliform, with a short cylindric tube, and spreading limb divided into five obtuse segments. STAMINA, about twelve or more awl-shaped filaments, disposed circularly, having oblong erect antheræ. PISTILLUM, a roundish germen below the corolla, single style, with a truncated stigma. PERICARPIUM, a roundish, unilocular, drupaceous fruit, containing two roundish nuts, convex on one side.

There are different species of *Styrax*, all exotics, though only one of which, the most noted sort, is commonly known in this country; generally requires the culture of hardy greenhouse plants, during its minor state; but when hardened by degrees to a more mature growth, it may be turned out into the full ground in a warm situation finally to remain.

The species is,

1. *STYRAX officinale*.

Common or officinal Storax.] Rises with a woody stem, branching on every side, twelve or fifteen feet high or more, covered with a smooth greyish bark; oval, moderate-sized, alternate leaves, hoary underneath; and bunches of white odoriferous flowers at the sides of the branches in June; succeeded sometimes by fruit, but rarely ripens in England.

This tree is a native of Syria, and most parts of the East; where it is highly valued for its fragrant medical gum; which it exudes from the trunk and branches.

It is, although an exotic of hot countries, moderately hardy, as in this country it only requires shelter of a frame or green-house from severe frost while young, for three or four winters; afterwards may be planted in the full ground against a south wall, and other sheltered situations; training some against the wall, others take their natural growth, and allow occasional shelter of mats in very severe weather.

The two following species are also retained in some green-house collections.

2. *STYRAX lævigatum*. — Smooth-leaved Storax.

3. *STYRAX grandifolium*. — Large-leaved Storax.

The common Storax is propagated commonly by seeds, obtained from abroad by the seedsmen; sowing them in pots of light earth an inch deep, observing as they are of a hard stony nature, they rarely come up the first year; so it is proper to plunge the pots under a frame during cold weather, and in the shade in summer, and in the second spring; then as the seed will be ready to germinate, if plunged in a hot-bed, it will forward them exceedingly, being careful to give water, and to harden the seedlings gradually to the full air in summer, in a shady place during the hot weather, and often watered; and in winter place the pots under a garden-frame, &c. to have shelter from frost; then in spring following pot them off separately, and manage them as hardy green-house plants for three or four years, when some of them may be turned out into the full ground in a sheltered situation as already hinted, and some may be retained in pots for the green-house collection.

The other two sorts are propagated as above, but must be continued always in pots to have the culture as green-house plants.

SUCCULENTÆ, (*Succus*, Juice) Succulent plants.

Succulent Plants are such as have thick

fleshy leaves, &c. abounding with juice, being principally of the herbaceous tribe; and some become of a ligneous nature in the stem, though Succulent in leaf: and of the Succulent kind there are perennials, biennials, and annuals; but principally perennial and evergreen.

Of the Succulent tribe many are tender exotics, inhabitants of the hot parts of the world; and some are of hardy growth; are mostly inhabitants of dry barren soils, and rocky places; many of which being of singular growth, are retained in our garden collections as plants of variety and curiosity; consisting of many different genera, each comprising more or less varieties, some for the green-house and stove, and some for the open ground. The following is a list of the principal genera, and their varieties, collected into one point of view, referring to their respective articles for particulars.

AGAVE, Great Amenum Aloe. (*All the species*).

ALETRIS, Guinea Aloe. (*All the species*).

ALOE, African Aloe. (*All the species*).

ANTHERICUM, Spider-wort. — Aloe-leaved. — Mock Asphodel. — *Anthericum*, Shrubby, Onion-leaved.

CACALIA, Foreign Colt's-foot. — *Ficoides* African *Cacalia*. — *Anteuphorbium* *Æthiopian Cacalia*. — *Kleinia* or Indian *Cacalia*. — *Papillary* *Æthiopian Cacalia*. — (*All of somewhat shrubby growth*).

CACTUS, Melon-thistle, including also the *Cereus* or Torch-thistle, and the *Opuntia*, or Indian Fig. (*All the species*).

COTYLEDON, Navel-wort. (*All the species*).

CRASSULA, Lesser Orpine. (*Most of the species*).

EUPHORBIA, Burning thorny plant. — (*Most of the sorts*).

MESEMBRYANTHEMUM, Fig Marigold. (*All the numerous sorts*).

PORTULACA, Purslane. (*All the sorts*).

SAXIFRAGA, Saxifrage. — *Cotyledon* Saxifrage, &c.

SEDUM, Lesser House-Leek, Orpine, and Stone-crop. (*Most of the sorts*).

SEMPERVIVUM, Live-ever, or Common House-leek. (*All the sorts*).

TETRAGONIA. (*Both the species*).

YUCCA, Adam's Needle. (*All the sorts*).

ZYGOPHYLLUM, Bean-caper. (*Most of the sorts*).

As many of these Succulents are esteemed singular curiosities in the vegetable creation, they are cultivated as such in most of our eminent gardens; a general description of the different

different sorts, their propagation and culture, may be seen in the proper places, under the heads of their respective genera.

They are mostly of a very carnosé or fleshy nature, both in stem, leaves, &c. abounding with humidity, and mostly evergreen; and many of them assume great singularity in their general port or habit; and as to magnitude, some, when they flower, obtain thirty or forty feet stature, as the *agave Americana*; others, such as the stone-crop, &c. not above three or four inches. See each under its proper genus.

Most of the sorts being originally inhabitants of dry soils, or saxatile or rocky situations, walls, tops of old buildings, and ruins, &c. and being naturally all very replete with moisture, should therefore in their culture be mostly planted in light dry, lean earth, or dry rubbishy compost (see COMPOSTS); otherwise, on account of their great humidity, are very apt to rot off in winter, more particularly the very Succulent and tender kinds of the green-house and stove (see GREEN-HOUSE and STOVE PLANTS); and which sorts in particular are always to be kept in pots, in order to be placed among the plants of those two conservatory departments, as their nature or temperament require, and managed accordingly, as hinted under the *Culture of Green-house and Stove-Plants* afore-said: always kept from too copious moisture; for as they naturally abound in juice, they require very little water at any season; but in winter especially should have it but very seldom and sparing; and some of the most Succulent hardly any water during all that season.

And as to the hardy kinds, such as the common house-leek, orpine, stone-crop, &c. (see their proper genera) will grow in the open air, on rock-work, dry rubbishy borders, tops of walls and low buildings; and are proper plants to introduce in artificial ruins and rocks, &c. — May also be planted in pots to move to any place occasionally. With respect, however, to the general description, uses, propagation, and culture of this tribe of plants, we refer to their respective genera, where the whole is fully exhibited; but as only the principal curious sorts are here arranged under one head, serves as an intimation of the nature of these kind of plants, and to assist the memory in recurring to the principal genera containing the different sorts.

SUCCUS, Sap, or the Juices of Plants.

The main vegetable juices or fluids are drawn by the root from the body it adheres to, whether it be earth, water, or other substance; thence ascends to the stem, branches, leaves,

flowers, and the minutest part of the fructification, &c. But whether the same Sap, so diffused to the extremities of the plant, ever returns, and that there is a circulation of Sap in plants analogous to that of the blood in animals, is a question, which will probably never receive a satisfactory answer.

Though many of the eminent naturalists contend for the circulation, and that the same juice descends again to the root, yet by accurate experiments it appears, that the Sap ascends not by the bark, but by the capillaries or fibres of the wood; and the curious observation of many renders it highly probable that the fluid which ascends by the said capillary vessels of the wood, descends to the root by the larger fibres of the inner bark that are most contiguous to the woody body. In support of this, the same experiments of ligature and incision, which evince a circulation of the blood in animals, succeed in the like manner in vegetables, particularly in such as abound with a milky Sap; since if the ligature or bandage is fastened tight round them, the part above is found to swell very considerably, and that below it only a little, whence it appears there is a juice descending from the branches: and as to the experiment of incision, it has likewise been observed, that upon a transverse incision being made into the bark and trunk of a tree, the juice which is expended or flows from the wound, proceeds in greater quantities from the upper lip of the gash, where the swelling likewise is much larger than below; so that from the result of such experiments it is rendered somewhat more than probable, that the sap returns from the extremity of the branches to the root; thence into the earth again. But some contend, that instead of the same juices going and returning, there are two several juices; the one terrestrial, as being imbibed from the soil, digested in the root, and from thence transmitted to the extremity of the plant; the other is supposed to be aerial, and received from the moisture of the air entering in at the extremity of the branches, and surfaces of the leaves. So according to this conclusion, the ascending and descending juices are not the same; and indeed with respect to the aerial sap, experiments have determined that the plant derives part of its nourishment by the extreme branches, and the leaves in general, and that the leaves contribute greatly both to the abundance and motion of the sap; for it is observable of new-planted trees in particular, having many of their branches lopped, they will not prosper near so well as those trees left entire; and if a tree when

high in sap is divested of its leaves, it will be found to retard the growth, both of its shooting, and that of the flowers and fruit.

However, the first and principal sap of a plant is furnished by the earth entering the roots in form of a fine and subtle water, which, the nearer it is to the root, the more it retains of its proper nature; and the farther from the root the more action it has sustained, and the nearer it approaches to the nature of the vegetable.

But what course the sap takes after it is imbibed by the roots, is not very clear; the vessels that take it up to convey it to the plant, are too fine to be traced, and hence it remains doubtful, whether it is by the bark, or the woody part, or the pith that the plant is fed.

In this the naturalists differ in opinion. Some contend for the bark, others for the wood; though in the former case they observe, that the juice raised from the earth by the capillary tubes or pores of the wood, is here supposed to descend by the larger fibres placed in the inmost part of the bark immediately over the wood; in which descent the sap being now sufficiently prepared adds some of its substance to the contiguous wood, and thereby gradually increases its bulk, so that the bark is thus also supposed to serve divers purposes; for it not only transmits the nutritious juices to the plant, but likewise contains certain fat oily juices to defend the fleshy external parts from the injuries of the weather.

In some cases, even the whole plant is no more than bark; the pulp or woody part having been eaten or rotted out, except just the outside shell, as often occur in willow, elm, &c. yet continue growing, and live a long time in that state.

On the other hand, those who contend that the wood conveys the principal nourishment, observe, that the whole woody body consists entirely of slender longitudinal capillary tubes or fibres, running parallel to each other from the root up the trunk and branches, being proper to receive in a fine vapour or humour, in the ascent of which the fibres become open, and their substance increased. And thus the trunks of trees are said to increase in their circumference.

The motion of the nutritious juices of vegetables is found to be produced much like that of the blood in animals, by the action of the air, &c. for it is discovered that vegetables consist of two orders of vessels; 1. such as receive and convey the alimental juices, answering to the arteries, lacteals, veins, &c. of

animals; 2. the *tracheae*, or air-vessels, being long fine pipes or tubes possessing principally the wood or ligneous body, and serve to receive and transmit the air, necessary for preparing and giving motion to the humours or juices.

As to the nature of the vegetable fluids, it appears, that plants contain many different juices, such as those of the root, stem, bark, &c. those of the leaves, the juices of the flowers, or genitals, and those of the fruit, the preparative of the last of which may be said to be nature's final work.

However, the principal vegetable juices are generally reduced to two; the lymph or sap; and the proper juice or blood of plants.

1. The lymph or sap is a simple fluid, being without colour or smell, and little different from water; and mounts from the root to the stem, and remote parts of the plant, as before observed, in its proper vessels, which are woody longitudinal hollow fibres, almost inconceivably fine, and always replete with sap; which, however, in spring, is found in greatest abundance, and then the bark is easily detached from the wood. On the contrary, when the sap-season is past, the bark is found closely applied, and, as it were, glued to the wood; or when a tree is in high sap, and stripped of the leaves, the bark, in a few days, will adhere as closely to the wood as in winter.

2. The other principal fluid, denominated the proper juice or blood of plants, and analogous to the blood in animals, contained in proper vessels, called likewise from their use vegetable blood, are straight longitudinal fibres, larger than the lymphatic or sap-vessels, and less numerous, which are filled with the proper juice, which is generally compound or coloured, and easily distinguished by its colour, smell, and substance, from the lymph or sap, it being either green, as in some plants, white as in spurge, fig-tree, and dog's-bane, yellow, as in celandine, red as in dragon's blood, mucilaginous or gummy, as in the jujube and mallow tribe, or resinous, as in the coniferous plants. So it is from the variety in colour and substance that the fluid in question is called the proper juice; each species of plant being supposed to contain a fluid peculiar to itself; and in this proper juice reside the smell, taste, and virtue of the plants.

SUCKERS.

Suckers are young offspring plants, arising immediately from the roots of older vegetables, and generally furnished also with roots; and being transplanted, readily grow and become

come proper plants, in all respects like the mother plant that produced them, being therefore, in numerous sorts of plants and trees, very eligible for the work of propagation.

So that Suckers may be considered as a sort of vegetable spawn or progeny, emitted from the roots of certain trees, shrubs, and other plants, to propagate their respective species and varieties; and, a very considerable share of the vegetable creation multiply exceedingly by this means; for numerous sorts continue sending up great plenty of Suckers every summer, each Sucker furnished with roots or fibres, and in one season form proper plants for transplantation; thus proving a very plenteous and expeditious method of propagation, both for numerous tree and shrub kinds in particular, as well as for many herbaceous vegetables; which sending up Suckers from the root in spring and summer, will be fit for transplanting the following autumn.

In trees and shrubs, the propagation by Suckers is also, in certain cases, a sure method to continue any approved or desirable species, or variety; the same; remarking, however, of grafted and budded trees, that Suckers thereof partake only of the nature of the stock; as for example, such Suckers as arise from a codlin stock, grafted with any other sort of apple, will continue invariably a codlin, without partaking any thing of the nature of the graft; the same being also observable of all other grafted trees and shrub kinds; observing, therefore, not to mistake so far in propagating by Suckers from the roots of grafted and budded trees, worked on different stocks, to suppose the Suckers will produce the same sort of fruit, &c.

But in trees, &c. that are wholly the same sort root and top, the Suckers thereof will also prove the same invariably in every mode of growth, as certainly as is obtained by layers, cuttings, grafting, &c.

As to the season for taking up or transplanting Suckers, of trees and shrubs, it may be performed almost any time in open weather, from October till March, being careful to dig them up from the mother-plant, with as much root fibres as possible, and trim them ready for planting, by shortening long straggling fibres, and cutting off any thick-knobbed part of the old root that may adhere to the bottom, leaving only the fibres arising from the young wood; though, it is probable some will appear with hardly any fibres; but as the bottom part having been under ground, and contiguous to the root of the main plant, they will naturally be much dis-

posed to send forth plenty of fibres for rooting; observing likewise, preparatory to planting them, to trim the stems of the shrub and tree Suckers occasionally, such as cutting off all lower laterals; and if any have long, slender, and weak tops, or such that you intend shall assume a more dwarfish or bushy growth, may be shortened at top in proportion, to from about half a foot, to one or two feet in length, according to their nature or strength, and as the case may require: others that are more robust and strong, or that you design shall run up with taller stems, may have their tops left entire, or shortened but little, as it shall seem necessary for the uses intended.

Being thus taken up and trimmed, proceed to plant them in rows in the nursery; the weak Suckers plant separately in close rows; also the shortened ones by themselves, and the stronger plants likewise separately in wider rows; so that the rows may be from one to two feet asunder, in proportion to the size and strength of the Suckers.

After being thus planted out in nursery rows, allow them the common nursery culture of cleaning from weeds in summer, and digging the ground between the rows in winter, &c. and in from one to two or three years, they will be arrived to due size for final transplantation.

Though some kinds of trees, &c. produce Suckers so strong in one season as to be fit for planting at once, where they are finally to remain; such for example, as some sorts of roses, and numerous other flowering shrubs; likewise some of the strong shooting gooseberries, currants, raspberries, and the like kinds.

And sometimes many of the shrub kind in particular, having produced a quantity of Suckers from the root, and these suffered to stand and grow up, each to a large plant, the whole from one root forming a considerable bush, as may often be observed in gooseberries, currants, and many other shrubs; and in which case each such bush being taken wholly up at the proper season before mentioned, may be divided to the bottom into so many separate plants; and as each Sucker will be amply furnished with plenty of roots, and of due size for flowering and fruiting, may plant them, if required, at once, where they are always to stand.

But the propagation by Suckers is by some objected to in some particular sorts of trees and shrubs, such as currants and gooseberries, &c. for any general supply, on a supposition that the trees so raised, are more adapted to

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run too considerably to Suckers, and over-run the ground round the mother plant, than such as are raised by any other method: however, it may generally be observed of such trees and shrubs as are naturally disposed to send up many Suckers, that by whatsoever method they are propagated, whether by seeds, suckers, layers, cuttings, &c. they commonly still continue their natural tendency to multiply by Suckers in the same abundance.

However, when it is required to have any sorts produce as few Suckers as possible, not to over-run the ground, or disfigure the plants, it is proper both at the time of separating the Suckers, or planting them off from the main plant, and at the time of their final removal from the nursery, to observe if at the bottom part they show any tendency to emit Suckers, by the appearance of prominent buds, should rub all such off as close as possible, which will prevent the production of Suckers proportionably.

As, however, many sorts of trees and shrubs are subject to throw out Suckers, considerably more than may be wanted at all times for multiplying the respective species or varieties; and that if permitted to remain, would over-run the ground, and become unsightly, as well as prejudice the parent plants; they should therefore be always cleared away annually at least: but in such as are not wanted for propagation, it is proper to eradicate them constantly as they are produced in spring and summer.

Likewise numerous herbaceous and succulent plants are productive of bottom off-set Suckers from the roots by which they are propagated, either generally or occasionally, according to the different sorts, both of the fibrous, bulbous, and tuberous-rooted tribe: as all off-sets from the root, and above-ground bottom side heads, of these kind of plants may be deemed a sort of Suckers, and of which great numbers both of the hardy and tender herbaceous and succulent tribe of plants, are very productive, and by which many sorts are most commonly propagated; and for which occasion they are generally proper to detach for planting when of one summer's growth, or two at most, which, in the fibrous-rooted kind, may be performed in autumn or spring; and in the bulbous, and many of the tuberous-rooted sorts, generally in summer and autumn, when the stalks and leaves decay.

In slipping and planting the above off-set Suckers of the herbaceous and succulent kinds, they may be planted, the smaller ones in nursery beds, pots, &c. according to the nature of growth, and temperature of the different

sorts, to have the advantage of one summer's advanced growth, proper for final transplantation; and the larger ones planted at once, where they are finally to remain, in beds, borders, pots, &c. agreeably as the different sorts are adapted.

SUFFRUTICOSUS.

Suffrutescent, or Under-shrubby.

Suffruticose Plants are a sort of ligneous or somewhat woody vegetables, that are between a shrubby and an herbaceous nature, exemplified in thyme, sage, hyssop, winter-savory, and such like plants.

SUN.

The Sun is doubtless the first mover of all vegetable motion; for as the naturalists observe, the Sun qualifies the air, which otherwise by its great frigidity would stop the whole course of nature: but by the Sun's diffusive power of light and heat, it exhilarates not only the race of mankind, &c. but the vegetable creation.

Its genial chearful rays promotes the growth of all vegetables, by its influence upon the soils; warming and clearing the pores of the earth, when diluted and sodden with too much wet, and puts the fibres of plants in motion for seeking their food; and its influential power operates on the branches, leaves, and fruit.

Plants, therefore, which in their growth are more or less exposed to the Sun, are, for the most part, more prosperous, forwarder, and attain greater perfection than such as grow in any considerable shade.

Likewise most fruits in a sunny exposure are considerably more beautiful, sooner ripe, and acquire superior quality in flavour, &c. to those growing in shady places.

The Sun's attractive power is very conspicuous in the exhalation or dispelling of those crude and unwholesome vapours with which the earth is so often infested, which would otherwise make it noxious, and render the earth a miserable desert: but more particularly the Sun warms, and enriches the soil, and prepares the juices for being sucked in by the fibres of plants.

For this reason, ground designed to be sallow, should always be turned up in rough ridges, to give free access to the influence of the Sun and air. Likewise all compost heaps should generally be prepared in sunny situations, in the full air, not in shady corners, or in sheds, as often practised.

SWIETENIA. Mahogany Tree.

This genus furnishes for the Stove one principal species, a tree of singular excellence for its wood, employed for innumerable domestic

meistic uses in household furniture, &c. is a native of South America and the West Indies, where the tree attains a vast magnitude; but being a tender exotic in this country, only a plant or two is retained in some curious stove collections for variety, in which it is but of moderate growth, adorned with pinnated leaves, and pentapetalous flowers.

Class and order, *Decandria Monogynia*.

Characters.] CALYX, a small monophyllous, quinquefid cup. COROLLA, five ovate, obtuse, concave, spreading petals, with a cylindric nectarium of one leaf, cut at the mouth into ten parts. STAMINA, ten very small filaments, inserted in the nectarium with oblong erect antheræ. PISTILLUM, an ovate germen, erect awl shaped style, crowned with a plane capitated stigma. PERICARPIUM, a large, ovate, woody capsule of five cells, containing many oblong compressed imbricated seeds, with foliaceous wings.

We know but of one species, viz.

SWIETENIA *Mahagoni*.

Mahogany Tree.] Rises with a woody trunk many feet high, with branches garnished with winged leaves, composed of six or eight pair of folioles on short foot-stalks; the flowers come out from the sides of the branches, and are succeeded by woody capsules opening in five cells at their base, containing imbricated winged seeds.

The propagation of this tree is by seeds procured from abroad, which should be sown in small pots of light earth and plunged in a hot-bed, and when the plants are come up about two or three inches high, they should be carefully taken up and transplanted into other pots and plunged in the bark-bed, shading them until they are fresh rooted, and afterwards managed as other stove plants of the like nature.

As this valuable tree cannot be cultivated in this country for economical purposes, only a plant or two, as above, in our stoves for curiosity: great quantities of this wood in vastly large blocks are imported from the West Indies, &c.

SYMPHYTUM, Comfrey.

This genus of plants consists of hardy herbaceous perennials, for variety in gardens and medicinal purposes, having long fleshy roots sending up annual stalks from half a yard to two or three feet high, adorned with oval and spear-shaped leaves, and terminated by monopetalous bell-shaped flowers.

Class and order, *Pentandria Monogynia*.

Characters.] CALYX is upright, pentagonal, five-parted at the brim, and permanent. COROLLA is one bell-shaped petal, with a

very short tube, a tubular ventricose limb; divided at the brim into five obtuse reflexed segments, having the chaps or opening armed with five subulate rays connected in a cone. STAMINA, five awl-shaped filaments, placed alternately with the rays of the chaps of the corolla, and erect, acute antheræ. PISTILLUM, four germina, supporting a filiform style, crowned with a simple stigma. PERICARPIUM, none; four gibbous, acute pointed seeds lodged in the permanent calyx.

There are three principal species, one is an inhabitant of England, the other two are of foreign growth, and are all hardy plants.

The species are,

1. SYMPHYTUM *officinale*.

Common officinal Comfrey.] Hath long, thick, fleshy, deeply-striking roots, black without and white within; crowned with large, oval, spear-shaped, rough leaves; upright, thick, branchy, rough stalks, two or three feet high, garnished with decurrent leaves, and terminated at top by bunches of drooping flowers, of different colours in the varieties, appearing in June and July.

Varieties are,] Common white flowered—purple-flowered—blue-flowered—yellow-flowered—red-flowered: but the white and purple are the most common.

It grows wild in England, especially the white-flowered sort, by ditch sides, and other humid shady situations; but is sometimes kept in gardens for variety and medical uses, the root being the useful part.

2. SYMPHYTUM *tuberosum*.

Tuberosely-rooted German Comfrey.] Hath a root composed of many thick fleshy tubers, sending up inclined rough hairy stalks a foot and a half high; long, narrow, acute-pointed, rough, hairy leaves, alternate below, and opposite at top; and the stalks terminated by bunches of pale-yellow flowers, in June and July.—Grows naturally in Germany, France, and Spain.

3. SYMPHYTUM *orientale*.

Oriental Comfrey.] Hath a thick fleshy root; upright rough stalks, half a yard or two feet high; oval rough leaves, on short hairy foot-stalks, and the stems terminated by drooping bunches of blue flowers, in March and April. It grows by river sides in the East, near Constantinople.

All these three species are of the herbaceous tribe, and perennial in root, but annual in leaf and stalk, which rise in spring, and produce flowers and seed the same year; the first and second sort in particular ripen plenty of seed; the other not always in perfection in England:

England: and soon after the seed is ripe, the stalks decay.

As to their merit as garden plants, they may be employed in large herbaceous collections, to increase the variety in the pleasure-ground; and the first sort in particular. *SYMPHYTUM officinale* may also be introduced in gardens as an officinal plant in medicine: all the three sorts are very hardy, and will prosper in any common soil and exposure; but delight most in shady moist places; planting those designed for variety thinly, in assemblage with other hardy perennials, and those intended for medical uses plant in beds or borders together, in rows, two feet asunder.

Method of Propagation, &c.

Their propagation is effected by seed, and by parting the roots.

By Seed.—Sow it in spring in a bed or border of common earth, and rake it in: they will soon come up plentifully, and in autumn the plants will be fit to transplant where wanted, in the manner above observed.

By parting the Roots.—This may be effected with expedition, and abundance in autumn, or early spring. Almost every bit of the root will grow, planting them either in nursery beds, or at once where they are to remain; and they will soon multiply into large plants.

SYRINGA, Lilac.

Two noted deciduous flowering shrubs are comprised in this genus, each comprehending several elegant varieties; growing twelve or fifteen feet high, in the first species, the other but five or six feet, of more slender, shrubby growth; adorned with oval heart-shaped and spear-shaped simple leaves, and large bunches of small, monopetalous, funnel-shaped, odoriferous flowers, of a very ornamental appearance.

Class and order, *Diandria Monogynia*.

Characters.] *CALYX* is small, monophyllous, tubulated, four-parted at the brim, and permanent. *COROLLA* is monopetalous, funnel-shaped, with a long cylindrical tube, divided above into four narrow revolute segments. *STAMINA*, two very short filaments, with small antheræ. *PISTILLUM*, an oblong germen, slender, thread-like style, and a thick bifid stigma. *PERICARPIMUM*, an oblong, compressed, acuminate, bivalvous, bilocular capsule, having a single seed in each loculi, being oblong, acuminate, and with a membranaceous border.

There are only two species, which, and their varieties, are fine ornamental furniture for the shrubbery compartments. Are supposed to be natives of Persia, but have been

long in the English gardens as eminent flowering shrubs.

The species are,

I. *SYRINGA vulgaris*.

Common Lilac.] Rises with an upright shrubby stem, soon dividing into many branches, and grows fifteen or twenty feet high; garnished with oval-cordated, or heart-shaped leaves, placed opposite; and the flowers produced at the ends of the young shoots, in large, erect, conical bunches, of different colours in the varieties, appearing in May.

Varieties are,] White-flowered—blue-flowered—purple-flowered, or Scotch Lilac,—bloached-leaved.

This species and varieties have been long residents of our gardens, as elegant flowering shrubs, to decorate the wilderness and shrubbery clumps; are all so very hardy as to grow almost any where without trouble, exhibiting a very ornamental appearance, in the great profusion of their flowers, which also imparts a very agreeable odour.

SYRINGA persica.

Persian Lilac.] Rises with a slender shrubby stem, dividing into long, slender, flexible, brownish branches, growing five or six feet high, adorned with narrow, spear-shaped, entire leaves, placed opposite; and the young shoots, terminated by long paniculated bunches of blueish, and other coloured flowers in the varieties; appearing the end of May, and beginning of June.

Varieties are,] Common purple-flowered,—white-flowered—blue-flowered—lacinated, or cut-leaved Persian Lilac, having the leaves deeply cut into several segments. All of which varieties of this species, are most delightful flowering-shrubs, and their flowers have an agreeable fragrance.

Both these species of Lilac, and their varieties, are very hardy shrubs, of the deciduous tribe; and although originally inhabitants of Persia, grow freely in the open ground in any exposure, and resist the severest frosts; having been many years in the English gardens as ornamental flowering shrubs; all the sorts flowering profusely and ornamentally early in summer, each panicle of flowers being large and conspicuous, composed of numerous florets, or separate flowers, continuing near three weeks in beauty, and are succeeded in the first species, and its varieties, by plenty of seed; but the second sort rarely ripen any in England.

As therefore these fine shrubs are hardy, and easy of culture, they highly merit admittance into every pleasure-ground, large or small,

small, being excellently adapted both to embellish the premises, and increase the variety; and for which occasion they will succeed in any common soil and situation, in shrubberies, borders, &c. proper to assemble with other hardy flowering-shrubs; and the common Lilac also to plant separately in any particular compartment to run up in full growth, both for flowering conspicuously ornamental, and occasionally to afford shade in summer, near arbours, &c. and both of which may be obtained at the nurseries, in proper growth for flowering, the first year of their transplantation.

They may be transplanted almost any time in open weather from October to March, in any common soil and situation, and from a few plants of each sort they will soon abundantly increase, the stock by suckers, &c. and as to culture, observe of the *Syringa vulgaris*, or common Lilac in particular, that as it generally throws out numerous suckers annually, they should be taken off accordingly, otherwise they will soon over-run the ground near them, and run up in a confused thicket round the mother plant.

Method of Propagation.

The propagation of both the species, and their varieties, is most easily effected by suckers and layers; also by seed. But the first sort, in particular, throws out numerous suckers, and produces also plenty of ripe seed for sowing.

By Suckers.—Numerous suckers rise annually from the roots, though generally more abundantly from the first than second species; and by which all the sorts may be most readily propagated; taking them up any time from autumn till spring in open weather, with roots to each, and plant them in nursery-rows two feet asunder, to remain for a year or two, or till wanted for final transplantation.—See SUCKERS.

By Layers.—Layers of all the sorts will readily grow, and form proper rooted plants in one year; chusing the young pliable shoots in autumn, and lay them in the common way; they will be well rooted by autumn following, and ready for planting off in nursery-rows; as directed for the suckers.

By Seed.—The first species, and varieties, ripen plenty of seed annually in autumn; and by which all the varieties may be raised, all of which are generally tolerably permanent, in retaining their difference from seed; which should be sown in October or November, or in the spring, in a bed of common earth, either broad-cast or in drills, and covered half an inch deep: they will come up in the spring; and in spring after the seedling plants may be set out in nursery-rows two feet asunder, and one distant in the row, to have two or three years growth, when they will be fit for the shrubbery.

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T A B

TABERNÆMONTANA, a genus of plants, furnishing two woody exotics, for the stove, and two hardy perennials for the pleasure-ground.

Class and order, *Pentandria Monogynia*.

Characters.] CALYX, a small pointed, connivent, five-parted cup. COROLLA, monopetalous and funnel-shaped, the tube long and cylindric, the border plain, and divided into five oblique blunt segments, with five bifid glandular nectarium. STAMINA, five very small filaments, topped with connivent anthers. PISTILLUM, two germens; style awl-shaped,

crowned with an oblong headed stigma. PERICARPIUM, two pointed, belled follicles reflexed horizontally, with two cells, containing a number of rugose, obtuse, oval-oblong seeds, immersed in a pulp.

There are eleven species belonging to this genus: those for our purpose are,

I. TABERNÆMONTANA *citrifolia*.

Citron-leaved Tabernæmo.] Rises with an upright woody stem, sending out several erect branches, garnished with thick, oval, opposite leaves; the flowers, which are sweet scented, and of a bright yellow, come out from the

wings of the stalks in glomerated umbels, and are succeeded by two swelling fruits filled with seeds, lying imbricated.

2. *TABERNÆMONTANA laurifolia.*

Laurel-leaved Tabernæmo.] Rises with a woody stem, sending out many branches toward the top, garnished with blunt, oval, opposite leaves, about five inches long, and two and a half broad, standing on short foot-stalks; the flowers terminate the branches in roundish bunches; they are white and of an agreeable odour.

Both these plants are tender, and require the assistance of a stove, and may be propagated by seeds or cuttings. By seeds sown early on a hot-bed, and, when come up, transplanted into pots of light earth, and plunged in the bark-bed, shading and refreshing them with water.

The Herbaceous Sorts are,

3. *TABERNÆMONTANA Amsonia.*

Alternate-leaved Tabernæmo.] With oval-lanceolate leaves, and a very smooth herbaceous stalk.

4. *TABERNÆMONTANA angustifolia.*

Narrow-leaved Tabernæmo.] With linear scattered leaves, and an herbaceous pilose stalk.

The two last species are hardy and perennial, the flowers are white and terminate the stalks, and are propagated by off-sets from the roots in spring or autumn.

TAGETES, African and French Marigold.

This genus is composed of noted herbaceous tender annuals, of the flowery tribe, for adorning the pleasure-ground, in summer; they rising with large branchy stems, and full heads, two or three feet high, ornamented with pinnated leaves, and all the stems and branches crowned with large, compound, radiated flowers.

Class and order, *Syngenesia Polygamia Superflua.*

Characters.] **CALYX** is simple, monophyllous, pentagonous, and quinque-dentate. **COROLLA** is compound and radiated, consisting of numerous tubular, quinquefid, hermaphrodite florets in the disk, and ligulated female florets in the radius, or circumference. **STAMINA**, in the hermaphrodite florets, five very short filaments, with cylindric antheræ. **PISTILLUM**, an oblong germen, filiform style, having a bifid reflexed stigma. **PERICARPIUM**, none; each floret succeeded by a single linear compressed seed, crowned by five acuminate, erect, unequal aristæ.

There are but three species of *Tagetes*, two

of which only are common to England, each comprehending many varieties; all of them tender annuals, and generally require the aid of hot-beds, or shelter of glasses, &c. to raise and forward them at first, planting them out afterwards in the open ground to grow to perfection; which they attain in July and August, producing a great profusion of flowers, both singles and doubles; but the latter are considerably the most ornamental, they growing large, and full to the very centre, appearing both conspicuous and ornamental, for two or three months in autumn, having different properties in the respective varieties, in respect to plenitude, colour, and variegations; but have mostly a very disagreeable odour.

The species are,

1. *TAGETES erecta.*

Upright Mexican Tagetes, commonly called African Marigold.] Rises with an erect, firm, single stem, branching erectly all around near a yard high; having large pinnated, light-green leaves, of many pair of narrow lobes; and all the branches terminated by large, erect, compound, yellow flowers, one on each peduncle, exhibiting different properties in the varieties.

Varieties are,] Lemon-coloured, or pale yellow-flowered African—Deep yellow-flowered — Orange-coloured — Sweet-scented—Dwarf, &c. — All of which varieties furnish both single and double flowers; the doubles being large, full, and swelling, rendered so by different modes of impletion, such as—Radiated doubles, rendered double by the impletion or multiplication of the plane florets of the radius.—Discous doubles, rendered full by the elongation and less profound division of the hollow florets in the disk—Fistulous, or quilled doubles, having all the florets appearing fistulous or hollow like a quill—Plane doubles, having all the florets plane or flat—Waved doubles, having all the florets waved—Common single flowered, having plane florets in the radius, and numerous small tubular florets in the disk.

All these varieties being species of the *Tagetes erecta*, they rise with erect, firm stalks and branches, as in the specific description; producing numerous flowers in regular succession, from June or July until October, succeeded by abundance of seed in autumn.

2. *TAGETES patula.*

Spreading Mexican Tagetes, commonly called French Marigold.] Rises with subdivided spreading stalks and branches, two feet high; large pinnated deep-green leaves; and at the sides and ends of the branches numerous, moderately

derately large, compound, radiated flowers, yellow, crimson, and variegated, in the different varieties.

Varieties are,] Pale yellow-flowered—Deep yellow-flowered—Golden yellow-flowered—Crimson-coloured, velvety—Variegated crimson and yellow, consisting of many beautiful variegations in different varieties—Striped, crimson, and yellow—And of each of which colours there are Single-flowered—Double-flowered—Large-flowered—Small-flowered—Sweet-scented, and dwarf French Marigold—All of which rise with subdivided stalks, of very branchy spreading growth, producing a great profusion of flowers from the sides and ends of the branches, in succession, from June or July, until November; but the double, the variegated, and the striped sorts, are the most beautiful; likewise some of the variegated and striped singles are remarkably elegant in their variegations, and richness of colours; all the sorts producing great plenty of ripe seed in autumn.

Both these species of *Tagetes*, and all their numerous varieties, are herbaceous annuals, rising from seed in spring, obtain full growth in July, flower and produce seed in autumn, and wholly perish, root and top, in October or November.

They being natives originally of foreign warm countries, are consequently of somewhat tender quality here; but have been long residents of the European gardens, as ornamental flowery plants; raising them annually from seed in spring, generally in a hot-bed; thence planted into the full ground, &c. in May or June, where they flourish in great perfection, till killed by the frost.

The flowers of both the species and respective varieties are large, and very conspicuous; but those of the first species, *Tagetes erecta*, are much the largest; and in all the sorts they are universally compound and radiated, each flower being composed of numerous smaller ones, all within one general calyx or cup; which in their common single state, the middle or disk consists of many small tubular hermaphrodite florets, and of many plain or flat-tongue-shaped female florets, forming the circumference or radius: but in their multiplied state, they are rendered double by different impletions; sometimes by the tubular florets of the disk being enlarged, lengthened, and less divided at the brim; and sometimes the impletion is effected by an increase of the flat florets, in the ray or radius, multiplying inward, and fill the disk, to the total exclusion of the tubular florets; and in some varieties the impletion consists wholly of plain florets; in

others, they become wholly fistular or quilled, as often obtain in some varieties of the first species *Tagetes erecta*.

The different varieties of each of these two species, although apt to vary in their colours, doubleness, and other peculiarities, will, with particular care in saving the seed of each respective sort, from the very finest full flowers and best colours, remain tolerably permanent, and mostly produce the like kind of flowers in return.

All the sorts, considered as ornamental plants, are eligible furniture for decorating the borders, and other conspicuous compartments of the pleasure-ground; also to plant in pots for moving occasionally, to adorn any particular compartment, in assemblage with other potted annuals: they will all grow freely in any common soil of a garden, and in an open exposure; and exhibit a very conspicuous autumnal bloom, in long succession; and being properly disposed in assemblage, will affect a very ornamental variety in the diversity of the various forms and colourings of the flowers, in the different varieties.

They therefore being all of the annual tribe, as we already observed, that being raised from seed sown annually in the spring, about March or April, in a hot-bed, or warm border, &c. as hereafter directed, they will arrive to a proper size for planting out towards the middle or latter end of May, or beginning of June, when the weather will have become settled or temperate enough to admit of their being planted any where in the full ground, finally to remain to produce flowers and seed.

They are all of very free growth, especially after being planted out finally in the full ground, where they require but very little culture.

The first species in particular, and varieties, as they always grow firmly erect, both in stem and branches, require but very little trouble after their final transplantation.

But the second sort, *Tagetes patula*, divides and spreads out widely near the ground in a rambling manner; it requires to be trimmed up at bottom to a single stem, and its branches also trimmed occasionally, to preserve the head somewhat regular, and within due bounds.

Method of Propagation.

As to the method of propagation, they are raised only from seed sown every spring in March or April, either in a hot-bed, to raise the plants to more early perfection, or in a warm border, about the middle or latter end of April, for a later bloom.

By a Hot-bed.—Towards the middle or lat-

ter end of March, or beginning of April, you may sow some seed of each sort in any moderate hot-bed either alone, or with other annuals of similar temperament, such as China aster, common balsamine, marvel of Peru, chrysanthemum, &c. See ANNUAL PLANTS. Having therefore a hot-bed ready, and sheltered with a frame and lights, or with hand-glasses, &c. or in default of either, arched over with hoops, to be covered with mats on nights, which will succeed tolerably, if not sown before the beginning of April, observing, in either method, the hot-bed being properly earthed at top, five or six inches deep; then sow the seed of each species and respective variety separate, either in shallow drills a quarter of an inch deep, or on the surface, and covered with light mould that depth; or may be sown in pots, and plunged in the hot-bed.

They will soon come up, giving occasional waterings, and admit a large portion of free air to strengthen the plants as they advance; which when about three or four inches high, prick a quantity of the best upon another moderate hot-bed four or five inches asunder, to have about three weeks growth or more to forward them as much as possible; assisting them with proper waterings, giving likewise occasional shade from the sun till rooted, and plenty of free air daily; another parcel of the same seedlings may, about the beginning or towards the middle of May, when the weather is settled tolerably warm, be planted out into the full ground, taking opportunity of showery weather; and plant them either at once where they are to remain, or in nursery-beds, in rows half a foot at least asunder; being careful to give water directly, repeating it occasionally in dry weather, together with occasional shade, where convenient, in sunny days, till the plants are well rooted afresh. And when those thus pricked out both in the hot-bed, and in the nursery-beds in the open ground, have had three or four weeks growth, or till from six or eight to ten or twelve inches high, they may be transplanted with balls of earth, without hardly any check by their removal; or some in the nursery-bed, in the full ground, may be permitted to stand till they show bloom sufficient to discover which are double and which single-flowered, and then chusing only the best sorts accordingly, removing them with a ball of earth about their roots as aforesaid, into the borders and pots, or other places intended: observing of the whole, in disposing them in the borders, to plant them at from five at least to ten feet distance from one another, and distribute the

different sorts so as to effect diversity, watering them directly, and at times till fresh rooted.

Or, if intended to plant the whole immediately out from the feed-bed into the borders, &c. finally to remain, as often practised to save time and trouble; and that if you would cultivate only the finest sorts, may plant two or three plants nearly close together in patches, about the borders, the aforementioned distance, or in pots, &c. and as soon as they show their flowers large enough to judge of their properties, may clear away the worst, and leave only one of the best sorts in each patch, or pot.

Likewise, when intended to plant any in pots, to adorn fore courts, &c. always select the very best doubles of the finest colours, from among those which have been previously pricked out in nursery-beds, and remained to show bloom, transplanting them with balls of earth into the pots, giving plenty of water, and place them in a shady border, &c. till they have taken good root; then remove the pots of plants where wanted.

Raising them in the open ground.—In default of hot-beds, &c. may raise all the varieties of these plants in the full ground, but the seed must not be sown before April, when, if convenient to cover with mats, or glasses, &c. of nights and cold weather, may sow in the beginning of that month: otherwise not generally till towards the middle: chusing some warm rich border, sow the seed either in shallow drills near half an inch deep, or all over the surface, and covered thinly with earth, or raked in evenly; observing, that if the place is defended with any spare hand-glasses, or frames and lights, or even with hoop-arches for the support of mats, it will be of much advantage in affording shelter in cold nights; however, this sowing often succeeds tolerably well without any covering, though probably not come so forward as those that have occasional shelter.

When the plants thus raised are from about three to five or six inches high, as formerly noticed in the hot-bed culture, they should be planted out either finally into the borders, or, if small, planted in nursery-beds for a little time; then transplanted where they are to remain, as before directed.

As to future culture of all these plants, after being finally planted out, give occasional waterings the first week or fortnight till they have taken root, as before advised; and after being advanced in growth, place some stakes where needful to the strongest large-headed plants, one stake to each; likewise trim off

low straggling branches near the bottom; and long ramblers of the top or head just to preserve a little regularity, more particularly in the *Tagetes patula*, which is apt to ramble considerably.

Those planted in pots will require constant watering, three times a week at least, or even every morning or evening in very dry hot weather.

Saving Seed of all the Sorts.

As to saving the seed of these plants; they ripen abundance in September; but it should be collected only from the finest double flowers, to preserve the respective varieties in as true perfection as possible, which, without this precaution, are apt to degenerate considerably; therefore gather only the prime large heads of seed; which, after being spread to dry properly, may either be beat or rubbed out, or retained in the heads; putting the whole up in bags or boxes till spring, for sowing.

Always save fresh seeds every year; for those more than one year old rarely grow.

TAMARINDUS.

Tamarind tree.

It is a large elegant tree of Indian growth, adorned with fine pinnated leaves; and bunches of tripetalous flowers; and is retained here in our stoves for variety.

Class and order, *Triandria Monogynia*.

Characters.] CALYX, four plane, oval, acute leaves, coloured and deciduous. COROLLA, three oval, plicated, equal, rising, spreading petals, the length of the calyx, with room for a fourth and lowest petal, &c. STAMINA, three awl-shaped, rising filaments in the sinus of the calyx, arched towards the corolla, and with oval incumbent antheræ. PISTILLUM, an oblong, pedicillated germen, awl-shaped, rising style, and thickish stigma. PERICARPIUM, a long, compressed, unilocular pod, having a double bark, and contains generally three angular seeds.

There is but one species, viz.

TAMARINDUS indicus.

Indian Tamarind tree.] Rises with a large trunk, dividing into a very branchy spreading head, growing fifty or sixty feet high, covered with a brown bark; long abruptly-pinnated leaves of sixteen or eighteen pair of oval lobes, not terminated by an odd one; and at the axillas of the leaves loose bunches of reddish flowers, succeeded by seed-pods full of an acid pulp, surrounding the seeds; but do not ripen in England.

The seed-pods of this tree are the tamarinds used in medicine, being of a pulpy acid nature, excellent to quench thirst, and allay heat; and

are imported hither from the West and East Indies, preserved in sugar.

This tree is a native of the East and West Indies, also of Ægypt and Arabia; and from which countries it was first introduced into the European gardens for variety; where it requires the constant protection of a stove all the year; so must be kept always in pots, and continued constantly in that department, and managed as the other woody exotics of the stove collection.

It is propagated by seeds obtained from abroad, which sow in spring, in pots of light earth, and plunged in a hot-bed or bark-bed in the stove, &c. where they will readily come up; and when the seedlings are three or four inches high, prick them out in separate small pots, giving water, and plunge them again in the hot-bed, repeating the waterings, and give occasional shade from the sun till fresh rooted: and as the plants advance in growth, shift them into larger pots, and keep them always in the bark-stove.

TAMARIX.

Tamarisk-tree.

Consists of two hardy deciduous tree and shrub kinds, for variety in the shrubbery compartments, garnished with narrow, finely-divided leaves; and numerous small pentapetalous flowers in loose spikes at the ends of the branches.

Class and order, *Pentandria Trigynia*.

Characters.] CALYX is obtuse, divided into five obtuse, erect segments, and permanent. COROLLA, five oval, concave, spreading petals. STAMINA, five or ten capillary filaments, having roundish antheræ. PISTILLUM, an acuminate germen, no style, but three oblong feathery revolute stigmas. PERICARPIUM, an oblong acuminate triquetrous, trivalved, unilocular capsule, having numerous small downy seeds.

There are only two species in our gardens, the one somewhat of the tree kind, the other a shrub, both deciduous hardy exotics, and remarkable for one producing pentandrous, and the other decandrous flowers; and both of which are very ornamental.

The species are,

1. **TAMARIX gallica.**

French Tamarisk.] Grows fourteen or sixteen feet high, with slender spreading irregular branches, covered with reddish and brown bark; narrow, finely-divided leaves, having the indentures imbricated, or lie over one another like scales of fish; and numerous small, pale-red, pentandrous flowers in loose spikes at the ends of the branches.

2. **TAMARIX germanica.**

German

German Tamarisk.] Grows eight or ten feet high, branching erectly, covered with a yellowish bark; small, divided, scaly, light-green leaves; and numerous, larger decandrous flowers in loose spikes at the ends of the branches.

Both these species of *Tamarix* begin flowering in July, and as they are produced numerously towards the ends of all the branches in large loose spikes, they appear very conspicuous and ornamental; for though the flowers are separately small, they are very numerous, and closely placed in each spike; and which in the first species have each but five stamina, (*pentandria*), and in the second species ten stamina, (*decandria*), each flower succeeded by oblong three-cornered capsules, full of downy seed, rarely ripening in England.

These shrubs are proper ornaments for decorating the shrubbery, and all hardy deciduous plantations; as they exhibit a very conspicuous variety, both in their beautiful foliage, and fine spikes of flowers.

They will succeed in almost any soil and situation; and may be had at the public nurseries; and being in possession of a few, may soon encrease them plenteously as below.

Method of Propagation.

They are propagated most readily by cuttings; also occasionally by layers; though they generally grow very freely by cuttings.

By Cuttings.—They will readily grow by cuttings of the young shoots; and the proper season for planting them is either in autumn, any time in October or November; or in the spring, in February or March, in open weather; chuling therefore a quantity of cuttings, young shoots of the year, and plant them in a shady border, or any moist ground, in rows a foot asunder, they will be well rooted by the following autumn; when, if necessary, they may be transplanted in wider rows, and in two or three years they will be ready for the shrubbery.

By Layers.—The young shoots are the proper parts to lay, and the autumn or early part of winter is the season for laying them; which perform by slit-laying, and let them remain a year; then examine them, and plant off such as are rooted in nursery rows till wanted.

They may also be raised from seed sown in a moist border as soon as it can be obtained.

TAMUS.

Black Briony.

Two hardy, herbaceous, climbing perennials,

are the principal species in this genus, sometimes raised for variety in the pleasure-ground, and for medical uses; are volubilate climbers, rising by support many feet high, garnished with heart-shaped and trifid leaves, and bunches of apetalous dioecious male and female flowers of no beauty.

Class and order, *Diœcia Hexandria*.

Characters.] CALYX, male and female flowers on separate plants, the males having a six-leaved cup, and the females a monophyllous one divided into six parts. COROLLA, no petals. STAMINA, six simple filaments in the males, with erect antheræ. PISTILLUM, in the female flowers, an oblong germen under the calyx, cylindric style, having three reflexed emarginated stigmas. PERICARPIUM, an oval trilocular bacca, having two globular seeds.

There are but two species, one an inhabitant of England, &c. among hedges and bushes, and the other of the island Crete; are both large fleshy-rooted plants, perennial in root, but with annual stalks.

1. TAMUS communis.

Common Black Briony.] Hath a very large, thick, fleshy root, covered with a blackish-brown skin, sending up long, twining-climbing stalks, winding round any support ten or twelve feet high; heart-shaped, undivided, smooth leaves; and long bunches of white flowers from the sides of the stalks, succeeded by oval red berries.

It grows wild under hedges, &c. in England, but is sometimes admitted in gardens as a climber for variety; and is esteemed of great efficacy in medicine.

2. TAMUS cretica.

Cretan Black Briony.] Hath a large, fleshy root, twining-climbing stalks, mounting by support ten or twelve feet high; trifid, or three-lobed leaves; and bunches of whitish flowers at the sides of the branches, succeeded by red berries.

Both the species flower in June and July; the flowers are small, and without petals; and are succeeded in the female plants by berries ripening to a red colour in August; each having two seeds. See the *Characters*.

They are both hardy perennials that are abiding in root, producing new stalks annually in spring; will grow any where in the full ground under shrubs and bushes; and a few of each sort may be introduced in the herbaceous collection for variety and observation, in thickets, woods, and wilderness plantations, among other climbers; and may be there raised both from seed and roots, planted at once, where they are to remain near the shrubs

shrubs and bushes, and suffered to run and climb over their branches, and any adjacent support.

Some may also be cultivated in any place for medical use, particularly the first sort, as being the most common and the most easily obtained, either the seed to sow, or roots to plant, as below.

Both the species are easily propagated by seed, and by parting the roots.

By Seed.—The berries ripen in autumn, which should be sown soon after, that they may more certainly grow the first spring. Sowing some at once where they are to remain, in patches between shrubs, &c. four or five seeds in a place half an inch deep; others may be sown in beds, either to remain, or for transplantation.

By parting the Roots.—The old roots often furnish off-sets, which should be slipped off early in autumn or spring, and planted at once where they are to remain.

TAN, or TANNER'S BARK, for making hot-beds, called bark-beds.

Tanner's Bark, commonly called simply Tan or Bark, is the Bark of the oak-tree, peeled therefrom when felled in the woods for timber, of which there are generally great falls made every spring, when all the bark is detached for the tanner's use in tanning of leather, being previously chopped or ground to pieces; and, after being used for that purpose, and cast out of the tan-vats, becomes a valuable material in gardening, for making those kinds of hot-beds commonly called bark-beds, which are considerably the most effectual hot-beds in use, for the culture of most kinds of tender exotics, that require aid of artificial heat in this climate all the year in stoves, &c. being generally made in an oblong pit or cavity six or eight feet wide, and three deep, the length at pleasure (see BARK-BED and STOVE); and the hot-bed being, in substance, the width and depth, &c. as above, it produces a very substantial, though moderate, uniform, and durable heat, not so apt as dung hot-beds to heat vehemently, and endanger burning the plants, nor send up a noxious steam; and the heat is of three times longer duration, and more easily managed; for a Bark hot-bed will support its heat near a year, with the assistance of a little fresh Tan added every three or four months, forking up the old and new together each time. See BARK-BED and STOVE, &c.

Therefore this valuable material, Tan or Bark, for the purpose of making hot-beds, is the cast-off Tan of the tan-yards; which, however, they preserve in store with the ut-

most care for sale to the gardeners, being careful to have that which is tolerably fresh out of the tan-vats, and that of proper quality, for there are different sorts, some being chopped or ground moderately large, some middling, and some cut very small, to make it go the farther for particular purposes of tanning, though not near so proper for the gardener's purpose as the middling or larger sort; but the largest of all heats the most violently, the middling more moderate and durable, and the small sort soon becomes earthy, and declines its heat; so that the middling Tan is preferable for general use: however, as there is now such an universal demand for this article, the desired sort is not always to be readily obtained; therefore, we are often obliged to put up with a mixture of all sorts.

But for the particulars respecting the choice and preparation of the Tan or Bark, and method of forming it into a hot-bed, and management thereof, see BARK-BED, BARK-PIT, FORCING-FRAME, and STOVE.

TANACETUM.

Tansey.

This genus comprises herbaceous and shrubby perennials for the kitchen-garden, pleasure-ground, and green-house collections, all of upright growth, from two or three to eight or ten feet high, garnished with bipinnated, pinnated, and entire leaves, in the different species; and the branches terminated by numerous compound flowers, in umbellate and corymbose bunches.

Class and order, *Syngenesia Polygamia Superflua*.

Characters.] CALYX, a compound flower, having a hemispherical, imbricated general cup. COROLLA, numerous tubular, quinque-dentate, hermaphrodite florets in the disk, and trifid female florets in the radius. STAMINA, five short capillary filaments, with cylindric antheræ, in the hermaphrodite florets. PISTILLUM, an oblong germen, slender style, having in the hermaphrodites a bifid revolute stigma, and two reflexed stigmas in the females. PERICARPIUM, none; a single seed in each floret, placed on the convex naked receptacle.

There are many species of *Tanacetum*, though not above six or seven esteemed for culture in our gardens; three of which are hardy, herbaceous perennials for the full ground, and four are of shrubby growth for the green-house.

Hardy herbaceous kinds.

Under this head is comprised the common Tansey with varieties, Costmary or Alecoast, and Siberian Tansey; all hardy, fibrous-rooted perennials,

perennials, abiding in root, but with stalks rising every spring and decaying in autumn.

1. *TANACETUM vulgare.*

Common Garden Tansey.] Hath a fibrous, tough, creeping root; large, bipinnated, cut, serrated leaves, of a strong agreeable odour; and upright, channeled stalks, branching erectly, two or three feet high; all crowned with umbels of yellow flowers in July and August.

Varieties.] Common plane-leaved Tansey, —Curled-leaved. —Variegated-leaved. —Scentless Tansey.

The common sort grows wild in England, &c. by road sides, and on the borders of fields, and sides of banks, &c. but which, and its varieties, have been long employed in our gardens, both as culinary and medical herbs; and, sometimes as ornamental plants: but for latter purpose the curled-leaved and variegated sorts merit the most respect; the curled sort in particular having very large thick leaves, most beautifully curled, appearing double as it were, and is of a heightened grateful fragrance; which, therefore, together with the variegated sort, demand a place in every ornamental collection, where they will exhibit a very conspicuous diversity.

However this herb, for its oeconomic uses in the kitchen and medicine, merits culture in every garden, the leaves being sometimes used in sallads while young and tender in the spring, and for making Tansey-cakes, puddings, &c. and the leaves, seeds, and flowers, are said to be a certain remedy to destroy worms in the human body.

This herb, therefore, merits culture in every kitchen-garden, planting slips of the root in beds, in rows a foot asunder, where it will abide many years.

2. *TANACETUM Balsamita.*

Balsamita Major, commonly called Costmary or Alecost.] Hath a thick, fibrated, fleshy, creeping root; oval, entire, serrated leaves; upright, round, branchy stalks, a yard high, and the stalks and branches terminated by corymbose bunches of deep-yellow flowers in August.

It is an odoriferous plant, formerly in much esteem both as a culinary and medical herb, and as such is still cultivated in some kitchen gardens, planted as the common Tansey.

3. *TANACETUM Sibericum.*

Siberian Tansey.] Hath a thick, fibrous, creeping root; pinnated leaves, having very narrow foliola or pinna, ending in two or three points; upright branchy stalks two feet high; and at the axillas and termination of the

stalks, smooth, corymbose bunches of yellow flowers, in June and July.

All these herbaceous kinds are durable in root, but annual in leaf and stalk.

Tender shrubby kinds for the green-house.

Consists of four shrubby species, mostly evergreens, originally from Æthiopia in Africa, and require the shelter of a green-house here in winter: they rise with shrubby stems and branches from three or four to eight or ten feet high; ornamented with pinnated and pinnatifid leaves, and bunches of yellow, compound flowers at the end of the branches.

4. *TANACETUM suffruticosum.*

Under-shrubby Æthiopian Tansey.] Rises with under-shrubby branching stems, three or four feet high, pinnated multifid leaves, of many very narrow lobes, sub-divided into acute parts, and roundish bunches of bright-yellow flowers at the ends of the branches.

5. *TANACETUM frutescens.*

Shrubby African Tansey.] Rises with a woody firm stem, branching six or eight feet high; pinnatifid leaves, with spear-shaped obtuse entire segments or lobes; and roundish bunches of sulphur-coloured flowers at the ends of the branches.

6. *TANACETUM crithmifolium.*

Samphire-leaved Shrubby Tansey.] Rises with a shrubby stem, branching five or six feet high; pinnated leaves, with very narrow entire lobes, remote from one another, and corymbose bunches of yellow flowers at the ends of the branches.

7. *TANACETUM flabelliforme.*

Fan-shaped shrubby Tansey.] Rises with a shrubby stem and branches three feet high; garnished with deltoid, sawed leaves, and yellow flowers in a corymbose, terminating the branches.

All these seven species of *Tanacetum*, both herbaceous and shrubby kinds, flower very abundantly every summer, though not all esteemed ornamental; but the shrubby kinds in particular most of all: the flowers of all the sorts are separately smallish, but being collected into numerous large umbellate and corymbose bunches at the top of the stalks and branches, appear very conspicuous; and being compound, each main flower is composed of many smaller ones, all within one general cup, and are succeeded by plenty of ripe seed in autumn, more especially the herbaceous kinds.

The three herbaceous *Tanacetums* are very hardy fibrous-rooted perennials, that prosper in almost any soil and situation, and are of great duration in root, which also creeps and spreads

spreads very considerably; by which the plants, propagated abundantly, and increasing into large bunches, require trimming or cutting in all round occasionally, to keep them within moderate bounds, especially the common Tansey, and varieties. The two first species in particular, are the most common in England, and are cultivated in kitchen-gardens as culinary aromatic herbs; but more commonly the *Tanacetum vulgare*; planting slips of the root of each sort in autumn or spring, in rows a foot asunder. They may also be all employed to diversify the compartments of the pleasure-ground, among other large herbaceous perennials.

And as to culture of these herbaceous kinds, it consists principally in keeping them free from weeds, and cutting down the decayed stalks annually in autumn; and as the roots increase fast into large bunches, spreading widely round, they require cutting in, or to be slipped occasionally, which otherwise are apt to over-run the ground; and to dig between the plants annually, in common with other such-like perennials.

The four shrubby *Tanacetums* being exotics from hot countries in Africa, are somewhat tender here, but they only require shelter from frost; so must always be kept in pots, and deposited among the green-house plants, and treated as other shrubby exotics of that collection; in which they will effect a very agreeable variety at all times of the year, but more particularly all summer and autumn, when in flower. They generally begin flowering the early part of summer, and continue mostly till the end of autumn; but are rarely succeeded by good ripe seeds in England.

Propagation of all the sorts.

Herbaceous kinds.—All the herbaceous species are propagated plentifully by parting the roots; also by seed.

By parting the Roots.—All these sorts multiply exceedingly by the root, which is the most expeditious and ready method of propagating them; and is performed by slipping or dividing the roots into slips, in autumn or winter, when the stalks are decayed; or early in spring, before new stalks shoot forth, planting the slips at once where they are to remain; those for the kitchen-garden, such as the common Tansey, &c. plant in any bed or border a foot and a half asunder; and those intended for variety in the pleasure-ground, dispose singly here and there, at eligible distances, to effect a proper diversity.

By Seed.—Plenty of seed may be saved in autumn, which being sown in spring following, in beds of light earth, broad-cast and

raked in, they will soon come up, and in July the plants will be fit to prick out in beds, in rows a foot asunder; some to remain, and others to be transplanted in autumn, where required.

Shrubby kinds.—All the four shrubby sorts are easily propagated by cuttings of the branches.

The cuttings may be planted any time in spring and summer, chusing the young and most robust shoots, which cut off in proportionable lengths; and if early in spring, &c. may plant them in pots of good earth, several in each, and plunge them in a hot-bed, where they will be rooted, and fit for potting off separately in six weeks; or, if in summer, the young shoots may be planted in the full ground, in a shady border, or where they may be shaded with mats from the sun; or planted in pots, and placed in the shade, or rather under a garden frame, &c. and shaded occasionally; in all of which methods giving plenty of water, they will readily take root; but those in the hot-bed will be forwardest: they however will all be well rooted the same season, and should then be transplanted in separate pots, then managed as other shrubby green-house plants. See GREEN-HOUSE PLANTS.

TARCHONANTHUS.

Shrubby African Flea-bane.

It is a shrubby ever-green exotic of Æthiopia, for the green-house collection; adorned with oval leaves, and compound flowers.

Class and order, *Syngenesia Polygamia Æqualis*.

Characters.] CALYX, a compound flower, having a monophyllous, top-shaped, septemfid, coloured, permanent cup. COROLLA, the compound flower is uniform, of many funnel-shaped, quinque-dentate, hermaphrodite florets. STAMINA, five short filaments, with cylindric antheræ longer than the corolla. PISTILLUM, an oblong germen, a style double the length of the flower, and two gaping stigmas. PERICARPIUM, none; a single seed in each floret, covered with down, ripening in the permanent calyx.

There is but one species, viz.

TARCHONANTHUS *camphoratus*.

Camphire-scented shrubby African Flea-bane.] Rises with an upright woody stem, branching out towards the top, ten or twelve feet high; oblong-oval, downy leaves, white underneath; and purple-violet flowers, in spikes at the ends of the branches.

It begins flowering about September, and continues a succession of flowers several months, but does not ripen seeds in England.

It is an ever-green exotic from Africa, but has been long introduced into our gardens for variety as a green-house plant, as it requires shelter in winter; must therefore be always cultivated in pots, and managed as other shrubby exotics of this collection. See GREEN-HOUSE PLANTS.

The propagation of this plant is easily effected by cuttings planted in spring or early part of summer, in pots, and plunged in a hot-bed, giving occasional shade and water; they will soon emit roots the same year, and be fit to pot off separately in two or three months. Or cuttings planted in May and June, in beds of common earth, or in pots, and shaded with mats or oiled paper shelters, or covered with hand-glasses, and shaded and watered; they will also strike root: observing in either case, that when tolerably rooted towards autumn, they should be potted off separately, and managed as the other green-house plants.

TAXUS.

Yew-tree.

It is a famous hardy ever-green tree, of stately spreading growth; a native of England, and most parts of Europe; and an old inhabitant of most European gardens, employed principally for ornamental and useful hedge-work, and detached trained figures; and occasionally as a rural standard tree for ornamental and timber plantations, in its natural growth; but has been more universally cultivated for hedges, and various detached formal devices; as it branches out numerous-ly and close to the very bottom, having all the branches very closely garnished with small, narrow, ever-green leaves, as to render it remarkably well adapted for training into any sort of hedges, and detached figures, &c. hence this tree was cultivated in great abundance for that purpose in ancient gardening.—See HEDGES, PLEASURE-GROUND, &c.

Class and order, *Diæcia Monadelphica*.

Characters.] CALYX, male and female flowers apart, on separate trees, having no calyx; but a germ or bud, like a four-leaved cup. COROLLA, no petals. STAMINA, numerous filaments in the males, coalesce in a column below, crowned with peltated depressed antheræ, having obtuse octofid margins, and open on each side the base, discharging the farina or pollen. PISTILLUM, in the females, an oval, acuminate germen, no style, but an acute stigma. PERICARPIUM, a small succulent red-berry, succeeds the female flowers, lengthened below, and globular at top, covered by a proper coat below; and includes one oval seed, prominent beyond the berry.

There are several species, but not more than one common in Europe, which is,

1. TAXUS baccata.

(*Berry-bearing Taxus*)—or *Common Yew-tree*.] Rises with an upright trunk, and very branchy spreading head, thirty or forty feet high or more, very closely garnished with small, narrow, stiff, dark-green leaves, growing near together, and very small, apetalous, yellowish flowers, male and female, on different trees, in clusters, at the sides of the branches, succeeded by small, red, pulpy juicy berries, containing the seed, ripe in autumn.

The following is also retained in some gardens for variety, both in the shrubbery and in the green-house collection.

Varieties.] With very short leaves—Broad shining-leaved—Striped or variegated-leaved.

2. TAXUS nucifera.

(*Nut-bearing Japanese Yew-tree*.) Having narrow stiff-leaves placed remote, or at a distance from one another.

The Yew, in all its varieties, is of the dicious class, bearing male and female flowers, mostly on separate trees; flowering generally in March, but the flowers make an inconsiderable appearance, and are succeeded in the females by great plenty of ripe berries, serving as food for birds, and to sow for the work of propagation; as by the berries or seed only the tree is generally raised, effected in great abundance in a bed of common earth, as directed under the article of their *Propagation*.

This tree, Common Yew, and varieties, are very hardy ever-greens, whose verdure assumes a dark melancholy hue, of a malignant nature: are all hardy enough to prosper in any common soil, even often in the most barren, cold situations, as may be observed in many parts of England, where the tree grows naturally, arriving to a large size, fit to fell for timber; which being of a very hard durable nature, is valuable for many useful purposes: and it is by some affirmed, that bedsteads made of Yew, will not be approached by bugs.

But in respect, however, to its merit in gardening, it may be employed various ways as an ornamental ever-green; also as a forest tree, both for ornament and use, as before observed. Formerly it was greatly employed for hedges, and detached trained figures, in various ornamental forms, in pleasure-grounds; but now seldom used in England for these purposes, since all formal works of that nature are mostly banished our gardens, and instead thereof it is employed in its natural state, in shrubberies, and other ornamental plantations.

princi-

principally of the ever-green tribe; being there permitted to assume its natural growth, in common with other rural trees and shrubs; sometimes also planted as detached standards, in extensive distant opens of grass ground, in parks and sides of hills, &c. for variety, and suffered to grow in the order of nature; likewise is very proper to be introduced as a forest tree in timber plantations, of the ever-green kind particularly (see FOREST-TREES and PLANTATIONS); and for hedge-work, where any internal hedges are required, either for ornament or shelter, no tree is better calculated, or so proper in many cases, it forming the closest, even, moderate-growing hedge of any tree of the ever-green collection. It is also peculiarly calculated for training into any formal or fancy figure, both in hedge-work, and as detached objects, for, by reason of its branches and leaves growing exceedingly close, and shooting very moderate and regular, they may be readily trained, by clipping, into any form: and as a hedge for shelter in nursery-grounds, &c. to defend the more tender or delicate young plants, a Yew hedge is well adapted. But as an outward hedge for a fence, it is not so well calculated as a holly or hawthorn hedge. See HEDGES.

For all of the above purposes may this noted tree be most easily trained, and for which it should be proceeded with accordingly, in its minor growth in the nursery; that if for hedges or any fancy figures, suffer the plants to branch away immediately from the very bottom, and cut them with garden shears once or twice every summer, to form them for the purposes intended; and if designed for the shrubbery and other rural plantations, prune them up a little at bottom to a single stem, and suffer the head to branch out on all sides and top diffusively; likewise, if for larger detached standards, trim up the stems gradually to elevate them in proportion; and encourage the head to branch out, and spread its branches widely around according to nature.

Yew hedges, and detached fancy figures, were in so great repute formerly, when nothing but uniform designs in gardening prevailed, that, in pleasure-grounds particularly, most of the divisions or quarters were surrounded with these sort of hedges, &c. so as in a manner to shut out all other trees, shrubs, and flowers, from the sight of persons in the adjacent walks; and nothing hardly but Yew hedges were to be seen on every side: hence many such gardens being, in a manner, destitute of variety and entertainment, these and other similar hedge-work, becoming in almost general disrepute, were rooted out by degrees,

and the gardens laid out in more open rural designs, in imitation of nature, exhibiting all the various plants to open view, from the contiguous walks and lawns. So that in modern designs, hardly any Yew hedges are admitted by way of ornament, or otherwise; or even so much as a single detached Yew, trained in any uniform manner. However, sometimes, in extensive grounds, Yew hedges, and other formal Yew figures, were so judiciously arranged, and trained, as to exhibit an ornamental appearance at first entrance, especially where they were not too prevalent; though should be introduced with great moderation and caution in the internal districts, not to obstruct the prospect, or shut out from sight the view of any desirable object within the garden.

But Yew trees, in their natural growth, are eligible to introduce in any large decorative plantations to increase the variety: though some persons reject the Yew, on account of the gloomy mournful aspect of its verdure, and poisonous quality; others again admire it for its solemn appearance, which effects a remarkably good contrast with the other more lively evergreens; and as to its baneful effects, it is certain the leaves are of a poisonous nature, and it is said was formerly used in compounding poisons. Hence some authors have distinguished this tree by the name of *TAXUS lethifera*, the *death-bringing Yew*; and hereby, say they, it is looked on as a symbol of mortality, and for that reason planted in church-yards to remind people of their approaching fate. It is certain that many accidents have happened to cattle, both horses and cows, by eating the leaves and young shoots of Yew, especially the clippings of Yew hedges, which, when they have lain in the sun a day or two, and half dried, some cattle, particularly cows, will sometimes eat them very greedily; so that every one ought to be remarkably careful either to burn the clippings of these trees, or put them quite out of the way of cattle, and not carelessly cast them over the wall or hedge, into lanes, highways, or on rubbish heaps, where cattle frequently come.

Young plantable Yews for all the fore-mentioned purposes may be procured at most of the public nursery-grounds, at a moderate rate; or may easily raise them abundantly from seed, of a competent size, in a few years, for final transplantation; i. e. from two or three to five or six feet high; though this tree may be removed occasionally at seven or eight feet height, if required, to form an immediate high hedge, &c. for the root being remarka-

By fibrous, the earth adheres close in a lump, so as to admit of removing large plants readily with a ball, to the places allotted them; supplying them with due waterings.

Method of Propagation, &c.

The propagation of this tree is effected principally by seed, which ripen plentifully in autumn, and may be sown in any bed or border in the open ground, either as soon as ripe, or in spring. It may also be propagated by layers and cuttings.

By Seed.—It is most advisable to raise the principal supply from seed; which if sown in autumn it will expedite the germination so far, as some part will rise the spring following; but if not sown till spring, they generally all remain in the ground till the second year before they come up, though if the seeds or berries are preserved in earth or sand till spring, then sown, they will all rise together in equal growth, more plentiful and regular than the autumn sowings: however, every one may suit their own convenience or inclination, in the time of sowing; and having therefore procured a due quantity of the Yew berries, divested of the pulp or mucilage, sow them in beds of light earth, either in shallow drills, or scattered over the surface of the bed, and covered near an inch deep with light mould, out of the alleys, or elsewhere. Being thus sown, no farther care is required but keeping the beds clean from weeds, both before and after the plants come up; giving also occasional waterings in dry weather, in spring and summer, which will forward and strengthen the seedlings in their growth: continuing this care of occasional waterings and weeding, let the seedlings have two years growth in the seed-bed; then in autumn or spring prepare some ground into four-foot-wide beds, and here plant them out in nursery rows, a foot asunder, to remain two, three, or four years; when some may either be planted out finally for hedges, if required; others in the nursery quarters, in rows, two or three feet asunder, and there trained for the purposes they are intended, according to the hints before given.

After growing in the nursery till they obtain from half a yard to four or five feet stature, they may be finally transplanted in autumn or spring, for their intended purposes; they will rise with a large spread of roots, and sometimes with good balls of earth, if thought necessary in transplanting any of large growth; and should be planted in their allotted places, as soon after removal as possible, giving each plant a good watering.

As to future culture, those to be trained in hedges, &c. must be clipped or shorn annu-

ally, once or twice in the summer (see HEDGES); and those in shrubberies, and other rural plantations, require only some of the lower branches pruned up occasionally to a single stem; but permit the head generally to spread agreeably to its natural mode of growth, except just reducing any considerable rambling branch, &c.

Remark, as to the striped or variegated Yews and other varieties, that in order to continue them exactly the same, the propagation of them should generally be effected by layers or cuttings, as they are rarely permanent by seedlings.

By Layers.—Young shoots, not more than a year or two old, being laid in spring, summer, or early in autumn, many of them will root, and in one or two years be fit for planting off into nursery lines.

By Cuttings or Slips.—In March or April, or end of August, or early in September, slip off a quantity of the one year's shoots, divest them of the lower leaves, and plant them in a shady border thick together, in small trenches, giving water at planting, and afterwards occasionally in dry hot weather; they will be well rooted in two years, fit for transplantation into wider nursery rows.

TELEPHIUM. True Orpine.

Consists of one species, a small hardy perennial plant, of procumbent or trailing growth, with small oval leaves, and short terminal spikes of pentapetalous flowers.

Class and order, *Pentandria Trigyna.*

Characters.] CALYX, five oblong, obtuse, concave, carinated, permanent leaves. COROLLA, five oblong, obtuse, erect petals, narrowed at the base. STAMINA, five subulate filaments, topped with incumbent anthers. PISTILLUM, a trigonous, acute germen, without style, crowned with three acute stigmas. PERICARPIUM, a short, three-sided, trivalvular capsule, with one cell, furnished with many roundish seeds.

The species is,

TELEPHIUM imperati.

True Orpine of Imperatus, or Live-long.]

Hath a thick, hard, fibrous root, of a yellowish colour; many slender, procumbent, green stalks, trailing on the ground, eight or ten inches long, with small, oval, stiff, smooth, greyish leaves, placed alternately; and short, thick, reflexed spikes of white flowers, at the termination of the branches; appearing in July, succeeded by ripe seeds in autumn.

This procumbent plant is proper to introduce for variety in any of the principal borders, &c. of the pleasure-ground, placed towards the front, in assemblage with other perennials.

perennials for variety, and as a flowering plant; allotting it a dry light soil, in which it will both grow more prosperously, and continue of longer duration than in moist ground.

It is propagated by sowing the seed in autumn or spring, in dry light ground, either where intended the plants are to remain, or for transplanting; they will come up in the spring, and the next year will flower and ripen seed. The propagation is also sometimes effected by off-sets, and by slips and cuttings.

TERRACE, (from *Terra*, the Earth).

A Terrace-walk.

In gardening, a Terrace is a raised bank of earth, &c. regularly formed in an oblong manner to any length, broad enough to admit of a spacious level walk at top, and elevated somewhat considerably above the level of the general surface; having the sides uniformly sloped, and laid with grass, and the top formed into a flat or level, sufficiently broad for a grass or gravel-walk, of proportionable width, as hereafter noticed; designed in gardens as a high, airy walk, to command a better prospect of the adjacent places around, both within and without side of the garden occasionally, as well as to enjoy the fresh air in summer more freely; and likewise in the former style of laying out gardens, a noble Terrace was considered as very ornamental in the pleasure-ground.

As to the necessary elevation or height of a Terrace-walk, it may be more or less as the situation admits, or requires, from one foot high to one or two yards; or even three or four yards or more in particular situations, and where there are plenty of earthy materials, rubbish, &c. either acquired or natural, for its formation; allowing breadth in proportion, from five to ten or twenty feet or more, and extended to any length required, or as may be convenient: for Terraces are sometimes formed on some naturally high, rising ground, to save as much trouble as possible, in bringing stuff from a distance; and are sometimes raised wholly of forced materials.

As to the proper situation in a garden for a Terrace, this may be varied as the natural situation of the place may require; though in ancient gardening Terraces were more common than at present; some designed both for ornament and grand elevated walks, as being considerably raised with noble sloping banks, having spacious walks at top for occasional walking; others being intended only as a moderately-raised walk, sometimes extending in a line from the front of the mansion, or conducted round some grand open division, &c.

Sometimes, however, in ancient designs, a grand Terrace-walk was formed next the house, ranging either parallel to the front, or to one or both wings; or extended in a perpendicular line outward from the front of the main house to some considerable distance; and sometimes continued both ways; the latter generally much less elevated than the former.

Sometimes also a Terrace-walk was carried round the boundary of a lawn, or other open division; others, sometimes contrived at some outer verge of the ground, or at the termination of some particular compartment.

And sometimes also a moderately elevated Terrace was carried almost all round the outward boundary of the pleasure ground, to command a more advantageous prospect of the open country.

In respect to form, a Terrace is always broader at the base than the top, and extended lengthways to any distance required; having the sides regularly sloped, of more or less acclivity, as the width, height, and situation admit or require. Sometimes both sides are sloped, and sometimes only one side, the other perpendicular, and faced with a substantial wall, &c. or by being formed against the side of a hill, or some naturally rising ground; in either case is finished always broad enough at top to admit of a proper walk. Likewise, in some naturally-elevated situations in particular, terraces were sometimes formed one above another in two or more ranges, each having its separate side slopes, and elevated walk; in all of which the slopes were neatly laid with grass, and the walk at top was occasionally of grass or gravel.

The ascent of entrance to a Terrace-walk was sometimes formed by an easy acclivity of a grass or gravelled slope; and sometimes by a grand flight of stone steps.

Where a naturally-rising ground, of some considerable elevation, occurs in a proper situation, or on the side of a hill, it is an eligible opportunity for forming a grand Terrace with the least expense and trouble, by not requiring the addition of so much foreign assistance in bringing earth and rubbish, as when raised entirely on a perfect level, wholly of forced earth, brought from another place for that purpose; or where there are any excavations of ground intended to form ha-has, pieces of water, &c. the excavated earth might be employed in forming a Terrace, &c. where required.

In proceeding to form a garden Terrace, the base must be staked out wider than the intended width at top for the walk, in order to admit of the ascent of slopes being moderate.

And

And in its formation all the forced earth and rubbish must be well rammed from time to time as it is applied, in order to render the whole equally firm, that it may not settle out of form after being finished; the slopes of which may either be laid with turf, or sown with grass-seed.—See GRASS.

TETRAGONIA, *Tetragonia*.

Comprehends shrubby and herbaceous succulent perennials of Africa, for the green-house collection; of somewhat decumbent growth, with succulent stalks, garnished with small, narrow, succulent leaves, and apetalous flowers at the sides of the branches.

Class and order, *Icosandria Pentagynia*.

Characters.] CALYX, four oval, plane, deflexed, coloured, permanent leaves. COROLLA, no petals. STAMINA, about twenty or more capillary filaments, shorter than the calyx, having oblong, incumbent antheræ. PISTILLUM, a roundish, quadrangular germen, under the calyx, five awl-shaped, recurved styles longer than the stamina, crowned with long hoary stigmas. PERICARPIUM, a large leathery, tetragonous, crustaceous capsule, with four longitudinal, narrow wings, or borders; and contain one quadrilocular hard nut, with four oblong kernels.

The species of most note are,

1. TETRAGONIA *fruticosa*.

Shrubby Tetragonia.] Hath slender, ligneous, succulent, grey stalks, branching numerous and stragglingly, four or five feet long, inclining to the ground, unless supported; and full of crystalline drops; very narrow, linear, fleshy leaves, in clusters, bespangled also with pellucid glittering pimples, and greenish and yellow flowers, by two or three together, along the sides of the branches, in July and August, succeeded by large tetragonous capsules, ripening seeds in winter.

2. TETRAGONIA *herbacea*.

Herbaceous Tetragonia.] Hath a remarkably thick, fleshy root; herbaceous, weak, trailing stalks, garnished with small, oval, plane, succulent leaves, and bright yellow flowers, along the sides of the branches, in February or March; sometimes succeeded by ripe seeds in England.

Both these species of *Tetragonia* being exotics from Æthiopia, require shelter here in winter; so must be always retained in pots, and placed among the green-house plants, and managed like other succulents of that collection; but should be always placed in the most airy part of the green-house in winter; as they only want protection from frost, either in that conservatory, a glass-case, or garden-frame;

and should be but very moderately watered during that season.

They are both of procumbent growth, and unless supported, trail on the ground. The shrubby sort is durable in root, stem, and branch, garnished with leaves all the year; but the herbaceous kind often die down to the ground, wholly or in part, towards autumn, and send up new stalks again about the latter end of the same season, continuing in leaf all winter, &c.

Both the sorts are retained in most of our eminent green-houses, to increase the variety; and as there is a singularity in their general port or habit, particularly the *Tetragonia fruticosa*, they merit admittance in every curious collection.

They are easily propagated by cuttings and by seed.

By Cuttings.—Cuttings of the young branches may be cut off any time in summer for planting, which, as being succulent, after having lain a few days to dry up the moisture of the cut parts, may be planted either in pots, and placed either in a garden-frame, and occasionally shaded, or plunged in any hot-bed to forward them. Or cuttings planted in a bed of light good earth, in the full ground, will also readily take root, allowing shade from the sun at first, and occasional waterings: they will be rooted in six weeks, or two months, fit for potting off separately, planting each in a small pot at first, and shift them into larger as they shall require.

By Seed.—Sow it in the spring in pots, and plunge them in any moderate hot-bed, which will generally bring up the plants the same year, which otherwise are apt to remain in the ground till the second spring, before they appear. When they, however, come up, inure them by degrees to the full air; and when two or three inches high, prick them separately in small pots, placed in the shade all summer, and moderately watered and managed as other green-house succulents.

TEUCRIUM, Tree Germander, including also *Polium* and *Marum*, &c.

This genus is composed of under-shrubby and herbaceous plants, for variety in the pleasure-ground, green-house, and for medicinal use, mostly of low or very moderate growth, some upright, others with trailing stalks, garnished mostly with small, simple foliage, and small, monopetalous, ringent flowers, in verticillate clusters and spikes, at the sides and ends of the branches, in the different species.

Class and order, *Didynamia Gymnospermia*.

Characters.] CALYX is monophyllous, cut half

half way into five acute nearly equal segments, and is persistent. COROLLA is monopetalous; ringent, with a short cylindric tube, incurved at the top, and with the upper lip erect, and deeply cut into two parts: the lower one into three, with the middle segment largest. STAMINA, two long and two short awl-shaped filaments, longer than the upper lip, and prominent between the segments, crowned with small antheræ. PISTILLUM, a four-parted germen, a filiform style, and two slender stigmas.—PERICARPIUM, none; the four roundish seeds lodge in the calyx.

To this genus is added the *Polium* and *Marum*, and some other genera, each formerly considered as a distinct genus, but now arranged as a species only of this genus, *Teucrium*, which comprehends above thirty different species; though scarcely a quarter of that number common to our gardens, or that have any definable merit for general culture, either for use or ornament; consisting of hardy, shrubby, herbaceous, and ligneous perennials, for variety and ornament in the full ground; and some tender kinds for the green-house collection.

Hardy shrubby kind.

Consists of one small, shrubby plant, hardy enough to live in the full ground in a warm, dry situation.

1. TEUCRIUM *flavum*.

Yellowish shrubby Teucrium, commonly called Tree Germander.] Rises with erect shrubby stalks and branches, a foot and a half or two feet high; having small heart-shaped, obtusely-ferrated, foot-stalked leaves, hoary underneath, with the floral leaves concave and entire; and numerous flowers by threes, in whorls, along the upper part of the branches, of different colours in the varieties.

Varieties.] Yellowish-flowered—Pale-white-flowered—Purple-flowered.

This shrub is durable in root, stem, and branches, foliated most part of the year, and produces flowers ornamentally in July, succeeded by ripe seed in autumn.

It is an exotic from Spain and Italy, long since introduced into our gardens; formerly kept as a green-house plant, but now is sufficiently naturalised to this climate to succeed in the open air all the year, in a sheltered, dry situation; though it is still also proper to keep some in pots, to move under shelter of a frame, or green-house, in severe winters, by way of a reserve, in case the fully-exposed plants should be killed by the frost.

It is easily propagated by slips or cuttings of the branches, and by seed.

By Slips, &c.—In spring or summer, slips

or cuttings of the young shoots may be planted either in pots, several in each, or in a bed or border of good earth; or, to forward them as much as possible, a quantity of slips may be planted in pots in spring, and plunged in a hot-bed; observing, in either case, to give due waterings, and occasional shade from the sun till rooted; and in autumn following, they may be transplanted in nursery-rows, for a year or two, and some in pots for occasional shelter in winter.

By Seed.—This may be sown in April, in a bed of light earth; and they will soon come up, and be fit for planting out early in autumn following.

Hardy herbaceous and ligneous kinds.

There are many herbaceous Germanders; but the most material are the following perennials, all principally of the fibrous-rooted tribe, rising mostly with herbaceous and slender ligneous stalks; both of procumbent and erect growth; seldom exceeding a foot and a half long or high; which in some are annual, and some become somewhat ligneous and abiding; are cultivated for variety and observation, and some as medical plants.

2. TEUCRIUM *Scordium*.

Common Water Germander.] Hath creeping perennial roots, sending up many square, procumbent, or trailing stalks, branching diffusely; oblong, indented, ferrated, close-fitting, opposite leaves; and small reddish flowers, generally two together, from the sides of the stalks and branches, in July and August.

This is a medicinal herb, and smells strongly of garlic.

It grows naturally in marshy places, in the isle of Ely, and other parts of England, and most parts of Europe; and sometimes admitted in gardens, in moist places, for variety, and as a medical plant.

3. TEUCRIUM *Scorodonia*.

Wood Sage.] Hath a fibrous, creeping, perennial root; upright, four-cornered stalks, a foot and a half high; heart-shaped, ferrated, foot-stalked leaves; and racemous clusters of whitish flowers, from the sides of the stalk upward, ranged mostly towards one side, appearing in July.

It grows naturally in woods and thickets in England, &c.

4. TEUCRIUM *Chamædrys*.

(Chamædrys) Smaller-creeping Germander.] Hath fibrous, very creeping, spreading roots; many four-cornered, very branchy, trailing stalks, near a foot long; oval, cuneiform, cut-crenated leaves, on short foot-stalks; and reddish flowers, growing almost in a verticillous, or whorls, round the stalk, three on each peduncle;

peduncle; appearing in June and July. Is a native of Germany, France, &c.

5. *TEUCRIUM canadense*.

Canada Germander.] Hath a fibrous perennial root; upright stalks, a foot and a half high; oval, lanceolate, serrated leaves; and white or reddish flowers, collected in racemous clusters, terminating the stalks, having six leaves under each verticillus, or whorl; flowering in July.

6. *TEUCRIUM lucidum*.

Shining Germander.] Hath a fibrous, creeping, perennial root; upright, ligneous, smooth, blackish-green stalks, branching diffusely; oval-oblong, cut-serrated, smooth, shining-green leaves; and purple flowers by pairs, at the axillas of the stalks and branches. Grows naturally in France and Germany.

The following are principally of the *polium* kind, moderately hardy, but rather impatient of severe frost; so should also keep some in pots, to move under shelter in winter.

7. *TEUCRIUM Polium*.

(*Polium*) or *Common Poley Mountain*, or *Mountain Poley.*] Hath a fibrated perennial root; herbaceous and ligneous, trailing, branchy stalks, prostrate on the ground; oblong, obtuse, crenated, downy, sessile leaves; and the branches terminated by roundish heads of yellow and other coloured flowers in the varieties; appearing in June and July.

Varieties.] There are many varieties of this species, distinguished by some little variation in their growth, having all roundish heads of flowers; consisting of yellow-flowered, white-flowered, upright blue-flowered.

It grows naturally in Spain and Portugal, &c.

8. *TEUCRIUM montanum*.

Mountain Poley, with Lavender Leaves.] Hath a fibrous, tough, ligneous root; somewhat ligneous, weak, procumbent stalks; spear-shaped entire leaves, hoary underneath; and small white flowers in a corymbus at the termination of the branches, in June and July.

9. *TEUCRIUM pyrenaicum*.

Pyrenean Mountain Poley.] Hath slender, trailing, somewhat ligneous, hairy stalks; wedge-shaped, and roundish crenated leaves; and flowers produced in a corymbus at the ends of the branches, of different colours in the varieties; appearing early in summer.

Varieties.] Purple-flowered—White-flowered—Variegated purple and white-flowered.

10. *TEUCRIUM pumilum*.

Dwarf Mountain Poley.] Hath somewhat ligneous, procumbent, slender, downy stalks, lying on the ground; linear, or very narrow,

plane leaves in quadrifarious clusters; and reddish flowers, collected into small heads, terminating the branches, in June and July.

11. *TEUCRIUM capitatum*.

Capitated Mountain Poley.] Rises with upright, somewhat ligneous, branchy stalks, a foot high; spear-shaped, crenated downy leaves; and white flowers collected into round heads at the end of the branches, standing on peduncles; appearing in June and July.

All these herbaceous *Teucriums* flower commonly in June and July; the flowers separately small, of the monopetalous ringent kind; produced generally in a sort of verticillus, or whorls, towards the upper part of the branches: in some placed at a distance, and in others in close heads or spikes; succeeded in the first three or four sorts by plenty of seed in autumn; but the others do not always ripen seeds freely in England.

They are all perennial plants, durable in root; and some of the ligneous kinds are also abiding in stalk and branches of several years duration.

All the sorts are occasionally employed in gardens for variety, and may be had at most of the nurseries.

The first four or five sorts are very hardy plants, that will succeed any where in the full ground, all of which may be propagated abundantly by slips of the roots, in autumn or winter; or of the young shoots in spring and summer; also by seeds.

But the *Polium* kinds are rather a little tender, and should therefore have generally a dry, raised, sheltered, sunny situation, as before observed; and some should also be potted for shelter in winter, under a frame, or in a green-house.

As to the method of propagating all these sorts, it is either by parting the roots, by slips of the branches, or by seeds.

The first five or six sorts may be propagated plentifully, either by slipping the roots, in autumn, winter, or spring; or by slips or cuttings of the young shoots in spring, or early part of summer, planted in a moist shady place; or by sowing the seeds in a bed or border of common earth in the spring.

The *Polium* kinds may likewise be raised plentifully from seed, and by slips or cuttings of the shoots in spring. The seed should be sown in spring in a bed of light earth, a quarter of an inch deep; where the plants will soon come up, and be fit to prick out in July or August; either in nursery-rows till autumn or spring, or planted at once where they are finally to remain. And as to the propagation by

by slips, it may be performed in April, chusing the most robust shoots, and plant them in an easterly border, giving occasional waterings and shade; and they will be well rooted by autumn for transplantation.

Tender shrubby kinds for the green-house collection.

Several of the shrubby kinds of *Teucrium*, being exotics of tenderer quality, require shelter here in winter of a green-house or garden-frame; so are commonly retained in pots and placed among the green-house plants, serving to increase the variety of that collection; and the following are the principal sorts thereof in the English gardens, being all moderate-growing shrubby plants, closely garnished with small simple leaves, mostly of a somewhat hoary or downy nature; and flowers growing in the verticillate order.

12. *TEUCRIUM fruticans.*

Shrubby or Spanish Tree Germander.] Rises with an upright, shrubby, hoary stalk and branches, five or six feet high; having oblong-oval entire leaves, smooth above, and hoary underneath, placed opposite on short foot-stalks; and blue flowers at the axillas of the branches, one on each peduncle; appearing great part of summer.

Variety.] With striped leaves.

13. *TEUCRIUM latifolium.*

Broad-leaved Spanish Tree Germander.] Rises with a shrubby downy stalk and branches, six or seven feet high; having broad, rhomboid-shaped, acute, entire, hairy leaves, downy underneath; and pale-blue flowers singly at the sides of the branches; appearing most part of summer.

14. *TEUCRIUM Marum.*

Syrian Marum or Mastick.] Rises with an upright shrubby stalk, and numerous slender hoary branches, from about a foot and a half to two or three feet high; having very small oval, entire leaves, pointed at both ends, hoary underneath, and placed opposite; and bright red flowers in clusters at the ends of the branches, generally ranged on one side, having hairy cups; appearing in July and August, but rarely any seeds in England.

This is a fine aromatic, and is an old resident of our gardens, esteemed both for its aromatic property, and to effect variety, generally as a green-house plant; though it will also sometimes succeed in the full ground, if planted in a dry sheltered situation; affording it protection of mats in very severe weather.

15. *TEUCRIUM massiliense.*

Marseilles Under-shrubby Germander.] Rises with upright, suffruticose, or under-shrubby

stalks, about a foot high; oval, acute-crenated, rough, hoary leaves; and purple flowers in erect clusters, terminating the stalks; appearing in July, succeeded by ripe seed in autumn.

16. *TEUCRIUM creticum.*

Cretan narrow-leaved Mountain Poley.] Narrow, linear, spear-shaped, entire leaves; and spiked clusters of flowers; with the flowers by threes.

17. *TEUCRIUM coccineum.*

Scarlet Mountain Poley.

All these shrubby germanders under this head (Green-house kinds), are mostly wholly perennial, or durable in root, stem, and branches; and generally retain their leaves most part of the year, flowering abundantly every summer, but rarely ripen good seeds in England.

As all these green-house sorts are tenderish exotics, originally from distant warm countries, they require to be sheltered here in winter from frost; and therefore must generally be cultivated in pots, in order to be moved into a green-house or garden-frame, during the winter, and managed as other green-house shrubs (see GREEN-HOUSE PLANTS); but some may also be planted in the full ground, in a warm dry situation, where they will often stand through our moderate winters tolerably well; but are liable to suffer by severe frost, which renders it necessary to treat the principal part generally as green-house exotics.

The propagation of all these tender shrubby kinds, is by slips or cuttings of the young shoots of the branches in spring, and early part of summer, as directed for the first species (*Teucrium flavum*); and when rooted, plant most of them singly in pots for removing to occasional shelter in winter, and managed as before hinted; others plant in the open air, in a dry warm exposure, to take their chance.

THALICTRUM.

Meadow Rue.

This genus consists wholly of hardy, herbaceous, fibrous-rooted perennials, some of which are cultivated in gardens for variety and ornament, rise mostly with upright stalks annually, adorned with many-lobed leaves, and smallish tetrapetalous flowers, generally crowning the stalks in paniculated bunches.

Class and order, Polyandria Polygynia.

Characters.] CALYX, none. COROLLA, four roundish, concave petals, that soon fall off. STAMINA, numerous compressed filaments, broadest above, and terminated by oblong erect antheræ. PISTILLUM, numerous

roundish pedicillated germina, having thickish stigmas. PERICARPIUM, none. Numerous oval sulcated seeds in a head.

There are twelve or fourteen species, and the most noted of which in our gardens are the following, retained in the pleasure-ground for variety; all of which have perennial roots, mostly fibrated and creeping; and send up erect herbaceous stalks annually in spring, which constantly decay to the ground in autumn.

1. *THALICTRUM flavum*.

Yellowish Greater Thalictrum, or Common Meadow Rue.] Hath a thick, fibrous, creeping, yellow root; sending up several round, furrowed, leafy stalks, five or six feet high; garnished with many-lobed leaves, having most of the lobes cut into three parts; and numerous whitish-yellow flowers terminating the stalks in many paniculated bunches, standing erect.

Variety.] Montpellier yellow-flowered.

This species grows wild in meadows, and other moistish places, and by river sides in England, &c. and is sometimes introduced in gardens for variety.

2. *THALICTRUM aquilegifolium*.

Columbine-leaved Thalictrum, commonly called Feathered Columbine.] Hath a thick fibrous root; upright round stalks, three or four feet high; large leaves composed of many lobes, much like the *aquilegia* or columbine; and numerous whitish flowers, terminating the stalks in large panicles, succeeded by straight, triangular, pendulous seeds.

Varieties.] Green-stalked, with white flowers and stamina—Purple-stalked, with purple flowers and stamina.

Is an inhabitant of Helvetia, &c. but has been long in the English gardens.

3. *THALICTRUM cornuti*.

Canada Thalictrum of Cornutus.] Hath a fibrous dark-coloured root; upright, smooth, purplish stalks, three or four feet high, branching towards the top; large, many-lobed leaves like those of columbine; and numerous white flowers terminating the stalks and branches, in large panicles, each flower having five petals.

4. *THALICTRUM angustifolium*.

Narrow-leaved German Thalictrum.] Hath a fibrated root; upright stalks, two or three feet high; large pinnated leaves, of many very narrow entire lobes; and numerous small whitish flowers in panicles, at the top of the stalks.

5. *THALICTRUM tuberosum*.

Tuberous-rooted Spanish Thalictrum.] Hath

a root hung with many-knobbed tubers; upright, almost naked stalks, a foot and a half high; small obtuse leaves, three-parted at the end; and largish white flowers, in roundish bunches, at the top of the stalks; each flower having five petals.

6. *THALICTRUM minus*.

Lesser Meadow Rue.] Hath small, fibrous, creeping roots; slender branching stalks, about a foot high; leaves cut into six parts; small and whitish and yellow flowers, in a nodding position, in loose panicles, at the top of the stalks.—It inhabits moist meadows and pastures in England, &c.

7. *THALICTRUM fœtidum*.

Stinking Dwarf Thalictrum.] Hath a fibrous creeping root; slender, paniculated, branchy, leafy stalks, six or seven inches high; leaves composed of many small, indented, foliola, having a stinking odour, and small whitish flowers in loose panicles, at the top of the stalks.—Grows naturally in the south of France, and Helvetia, &c.

8. *THALICTRUM alpinum*.

Alpine Dwarf Thalictrum.] Hath a fibrous creeping root; slender, single, almost naked stalks, about six inches high; leaves having small obtuse lobes, and whitish flowers in single clusters terminating the stalks.

All these species of *Thalictrum* generally flower in June and July, except the Alpine sort, which commonly flowers in April or May; the flowers separately are small, but collected many together in paniculated bunches at top of the plants, each flower having generally four petals, and in some species five, as in their respective descriptions; and are succeeded by ripe seeds in August and September.

They are all very hardy herbaceous perennials, that will succeed in any common soil and exposure, in the full ground; though generally are the most prosperous in shady moist situations: they are esteemed, some as flowery ornamental plants, others principally as plants of variety, and botanical observation; though all the sorts may be employed to diversify the pleasure-ground in any of the open compartments, in assemblage with other herbaceous perennials; and are all easily raised from slips of the root in autumn, which will creep exceedingly, and multiply in great abundance.

But the second and third species are the sorts that are the most commonly esteemed, and cultivated in the English gardens as ornamental flower plants, they flowering more conspicuously than the others; though the first sort, and also all the other species are

eligible to assemble in the borders and other pleasurable compartments to increase the variety.

The propagation of all the sorts is very easily effected in abundance, by parting the roots in autumn, when the stalks decay, or in the spring before new ones shoot forth; planting the slips, the strongest where they are to remain, and the weakest in nursery-rows, to have a summer's growth, or to remain till wanted.

Likewise by seed sown in the spring, in a bed or border; they will soon rise, and the seedling plants will be fit to plant out towards autumn following.

THEA.

The Tea-tree.

This genus comprises those two curious and distinguished Chinese evergreens, the Bohea and Green Tea-trees; universally famous for producing the leaves of which is made, by infusion, that well-known domestic article Tea; are of moderate growth, rather of the shrubby kind with slender branches; garnished with oblong-oval, and spear-shaped, sawed, smooth, nervous leaves, two or three inches long, and large whitish-red flowers of six to nine oval petals; succeeded by tricapsular, trilocular fruits, with three seeds singly.

Class and order, *Polyandria Monogynia*.

Characters.] CALYX, small, flat, of five or six roundish, blunt, persistent folioles. COROLLA, six to nine large, roundish, concave, equal petals. STAMINA, many slender filaments, shorter than the corolla, with simple antheræ. PISTILLUM, a globose, three-cornered germen, and awl-shaped style, crowned with a triple stigma. PERICARPIUM, a tricapsular fruit of three roundish united parts, trilocular and opening at top, with roundish solitary seeds, one in each cell.

The species are,

1. THEA *Bohea*.

Bohea Tea-tree.] Rises with an upright shrubby stem and slender branches, having ash-coloured bark, garnished with oval, obtuse-pointed, sawed leaves, about three inches long, and two broad, placed alternately, of a dark-green colour, and rosaceous whitish flowers at the sides of the branches, having generally six petals.

2. THEA *viridis*.

Green Tea-tree.] Rises with a shrubby stem and branches, garnished with spear-shaped, sawed, plane leaves, three or four inches long, of a light-green colour, and whitish flowers having generally nine petals.

These two noted trees, or rather shrubs, are natives of China and Japan; introduced

in our gardens for curiosity, variety and ornament, both as green-house plants, and in the full ground in a warm situation; they being moderately hardy to stand our ordinary winters with some occasional protection from frost, especially if planted in some dry well-sheltered compartment to have the full sun in the winter season.

However, it is advisable both to have some in pots to remove under shelter either of a green-house, glass-case, or deep garden frame in winter, as a more certain protection from severe weather; and others planted in a dry, well-sheltered, warm part of some principal shrubbery compartments, conspicuous to sight; and afford them occasional defence of covering from rigorous frosts; by which they generally stand our common winters tolerably well, grow freely in spring and summer and often show plenty of blossoms in their proper season.

Both the sorts are propagated by layers of the young wood, in the autumn, spring, or early part of summer; and will be rooted to transplant in autumn or spring following: also by cuttings of young shoots in spring and summer, planted in pots, and plunged in a hot-bed: likewise by seed, assisted by the same means: and in all of which methods of propagation, the newly-raised young plants should be transplanted singly in small pots, and moved under the protection of a frame, &c. in winter to shelter them occasionally from frost, till they gain some tolerable degree of strength, of at least, one or two-feet growth; then some may be disposed in a warm situation in the full ground, as formerly intimated, and some retained in pots, to move under shelter in winter, and these shifted into larger pots according as they advance of some tolerably increased size in their general growth in the root and head.

Thus these two noted exotic shrubs are cultivated in our gardens to diversify the green-house collections, and those of principal shrubbery compartments: though, in this country, only a few plants of each sort are retained principally for those purposes, and as noted curious exotics as well as for ornamental variety in their general growth.

But in China, their native soil, they are cultivated in vast abundance in very extensive plantations, for their leaves, of which the Chinese make a valuable merchandise for the supply of all parts of Europe, &c. with which to make the Tea, now so generally used every where.

For this purpose, they pluck the leaves in three different gatherings annually: the first

gathering being of the youngest leaves, is superior to the others, and is generally called imperial Tea; the second gathering, in older leaves, is next in goodness; and the third gathering being of the oldest leaves, is inferior to the two former.

But in each gathering, the leaves being plucked promiscuously as they come to hand, care is afterwards taken, previous to their usual manufactured preparation, to arrange them into different classes, according to their size and goodness, which produces the different qualities and prices of the prepared Tea; and of the last, or third gathering particularly, when the leaves are of full growth, they being sorted into classes; the lowest of which being composed of the oldest leaves, is the coarsest and cheapest sort of Tea, much inferior in flavour to that of the others.

After the leaves are gathered and sorted, as above, they are then prepared into the form we receive the Tea from abroad, by drying them, when fresh, over a fire in an iron pan, constantly stirring them about; and then rolling them while hot, with the palm of the hand, on a mat, or canvas, till they curl up; then when cold, the Tea thus prepared is put up in some vessel or case, and kept very close from the air; either in large China jars, or canisters, or in chests lined with lead, in which latter it is commonly imported in this and other countries, from China, by shipping annually, in amazing quantities; supplying millions of people as one of the daily articles of food in its peculiar preparation.

THEOBROMA.

Chocolate Nut Tree, &c.

Comprises two exotic trees of the West Indies, retained here in some eminent stoves for variety; are adorned with large oblong and heart-shaped simple leaves, and small pentapetalous flowers, in bunches, at the sides of the branches.

Class and order, *Polyadelphia Pentandria*.

Characters.] CALYX, three oval, concave, reflexed, spreading, deciduous leaves. COROLLA, five concave, galeated or arched, quinquenervous petals, having each a bifid, horn-like bristle at top, and a bell-shaped nectarium of five oval-lanceolate, connected, spreading leaves. STAMINA, numerous awl-shaped filaments in five bodies, terminated by so many antheræ. PISTILLUM, an oval germen, awl-shaped style, and simple stigma. PERICARPUM, a woody, unequal, oblong, or roundish fruit, or nut; having many oval fleshy seeds arranged in five cells.

There are two principal species, both of the tree kind, though the first is but of very mo-

derate growth, and the second obtains some considerable stature and magnitude.

1. THEOBROMA *Cacao*.

Cocoa or Chocolate Nut Tree.] Rises with an upright, robust stem, about half a foot thick, branching ten or twelve feet high; large, oblong, entire, opposite leaves, near a foot long, and half as broad; and numerous yellowish flowers, in bunches, from the sides of the trunk and branches; succeeded by oblong, quinquangular fruit, full of seeds, of which is made the chocolate.

This tree inhabits the hot parts of America, where it is also attentively cultivated for its fruit, to make the chocolate; being made of the kernels, which are first roasted in a pan, and reduced to powder; then worked with orange water, and formed into a paste; afterwards mixed with sugar, aromatic spices, and perfume; then formed into rolls or cakes, and exported to Europe, and other different parts of the world.

2. THEOBROMA *Guazuma*.

(Guazuma), or Bastard Cedar of Jamaica.] Rises with an upright large trunk, branching numerous and spreading, thirty or forty feet high; oblong, heart-shaped, serrated, alternate leaves, four inches long; and numerous small yellowish flowers at the sides of the branches; succeeded by roundish, tuberculated rough fruit, containing the seed.

Both these trees being exotics from the hot parts of America, in this country require the indulgence of a stove; and in many of which a few plants are retained for variety: so must be kept always in pots, and placed in that conservatory, and managed as other woody exotics of similar quality.

3 THEOBROMA *angusta*.

Angustous Chinese Bastard Cedar.] With hearted seven angled leaves.

They are propagated by seed obtained from abroad, sowing it as soon after its arrival as possible, in pots, and plunged in a bark-bed, where they will soon come up; and when about three inches high, pot them off separately, and plunge them in the bark bed in the stove; and manage them as other woody exotics of this department.

THERMOMETER.

An instrument resembling a weather-glass, for measuring and demonstrating by inspection the degrees of heat and cold at all seasons, and which proves of great utility in the culture of tender exotic stove plants, by serving as a guide to regulate the proper degree of heat for stoves or hot-houses, containing such plants; particularly in winter, when fire heat is used. See STOVE.

As to the construction of a botanical Thermometer for a hot-house, it consists of a long slender glass tube, or pipe, about eighteen inches or two feet long, having a small glass ball or globe at the lower end; and is fixed longitudinally on a brass or wooden plate or frame, the same length, or longer, and four or five inches broad; the glass tube and ball being furnished with a quantity of coloured liquid spirit, which is affected by heat and cold so as to ascend higher or lower in the tube proportionably, a scale being marked on the frame along each side of the tube, divided into the different degrees of heat and cold; and the spirit ascending by the heat of the internal air of the Stove, promoted by fire, &c. points out on the scale the proper degree of heat required, having the name of some remarkable exotic, such as the *ananas*, or pineapple, wrote on the scale as a standard mark of the requisite temperature of heat, so as when the internal heat of the stove raises the spirit to that mark, or within five degrees over or under, is the proper temperature for the growth of the *ananas*, and all other tender plants from the hottest parts of the world; so that the fires requisite for the stove in winter, are to be made stronger or weaker, according to the direction in the Thermometer.

Thus a good Thermometer in Stoves is more particularly useful in winter, during the time the fires are made in the flues for warming the air internally; it being generally hung up towards the centre of the stove, so as the warmth thereof may operate moderately and equally on every side, and discover the real temperature of the general internal heat, which should be supported always nearly equal by the aid of bark hot-beds and real fire, sufficient to raise the spirit in the tube to the mark *ananas* aforesaid, or but a little over or under.

Remarking, however, the Thermometer should not only be suspended nearly towards the centre of the stove, but also out of the sun, or at least placed with its back thereto, that the glass tube and ball containing the spirit may be shaded from the sun-shine as much as possible; and also placed at some medium distance from the fire place and flues, so as neither the direct rays of the sun, or heat of the fire, darting immediately on the tube and ball, may affect the operation of the inclosed liquor, and cause it to mount considerably higher than would be effected by the real general warmth of the air of the stove, and be thereby led inadvertently into an error, in supposing the internal heat to be much stronger than it really is, when probably it is not strong enough; therefore this instrument should always be

judiciously placed as above, so as to be affected only by the real general warmth of the internal air; and by observing this, you may easily regulate the stove heat at all seasons to such proper temperature as is requisite for the culture of the plants before mentioned.

Therefore every stove ought to be furnished with a good well-regulated Thermometer, as a guide for more certainly determining, at all times, the necessary degree of heat; for in winter, when fires are requisite, it is easy to make them of more or less strength, as you shall see necessary, to warm the whole inclosed air equally, to such a temperature of heat, as to mount the spirit in the Thermometer to the degree marked *ananas*, which should be well attended to, and continued always as nearly as possible to that standard, or not exceeding five or ten degrees over or under.

Or if the Thermometer should at any time discover the fire heat in winter, &c. to be considerably too strong, let the fire be immediately lessened, and open the door of the furnace to cool the flues; also, if calm mild weather, admit fresh air moderately, if it shall seem necessary, in order to reduce the heat as soon as possible, nearly to the proper standard.

Likewise in summer, in very hot sunny weather, if the internal heat of the stove appears by the Thermometer to be much too powerful in the middle of the day, it is easily reduced to the proper temperature, by sliding open the glasses to admit free air, as you shall see convenient.

THICKETS.

Close plantations of trees and shrubs, in pleasure-grounds, parks, &c.

Plantation thickets are designed for different purposes, such as sometimes to repel the force of tempestuous and cold cutting winds, either from the habitation, or some particular district of the garden; or sometimes to form places of shade or retirement in summer, having spaces for walks, recesses, &c. under the umbrage of the trees; others occasionally to serve both to conceal or shut out from view any unsightly or disagreeable objects, either within the limits of the garden, or without its boundary; and also sometimes to form a screen or blind arranged towards some outward boundary to conceal from the sight of persons without, any particular compartments of the garden. Likewise Thickets are sometimes extended considerably along next some outward boundary of pleasure-grounds, parks, &c. both to exhibit an exterior appearance of extensive plantation, and to form a continual extent of shelter from cold or furious winds, &c. to some otherwise exposed interior parts; or also sometimes

times so arranged as to afford a large extent of shady and private walking, having walks conducted in the serpentine order between the plantations.

And Thickets are also, on some occasions, adopted in some internal parts of large pleasure-grounds, and parks, in contrast with the more open and airy plantations; and sometimes are formed on some side district, extensively in a close plantation in imitation of a natural wood; and in which to have shady wood-walks, winding variously through the plantation. They are also introduced somewhat similarly to form recesses, by environing particular spaces, rendering them retired, shady, and sheltered, by the surrounding trees and shrubs composing the said Thickets; and sometimes close Thickets of hardy trees and shrubs are disposed in detached clumps in capacious open situations to affect a diversified ornamental variety, the said clumps being distantly stationed not to obstruct the view of any desirable prospect.

In the formation of Thicket plantations, they are sometimes planted wholly of large tree kinds, five or six to eight or ten feet asunder, either some in regular lines like a close grove, or others more generally in a sort of promiscuous planting, as it were, but with some degree of order in the distances: and Thickets are also often composed of various trees and shrubs together to affect a more full, close growth below and above, and to display a greater diversity in the plantation, by disposing the various shrubs properly between the larger trees, in some order of gradation, the lowest towards the front, and the taller growths backward, in proportion, thereby forming a sort of close underwood Thicket below, while the tree kinds run up and form a thickety growth above.

Sometimes, in particular compartments of shrubberies, Thickets are formed wholly of shrubs only, of different sorts and degrees of growth, from the lowest placed forward to the tallest behind; being sometimes arranged towards some outer boundary to run up in a close natural growth to cover and hide the outward fence of paling, walls, &c. and permitted to branch spreadingly over the ground in a thickety manner.

Likewise, Thicket plantations are occasionally adopted of distinct or separate tree kinds in some extensive premises, parks and out-grounds, formed wholly each of particular sorts of trees disposed separately in distinct plantations, such as Thickets of Elm, others of Ash, Beech, Poplars, &c. each sort di-

stinct; and of Alder, Willows, and other aquatic kinds, similarly in marshy situations.

General Thickets may be composed of any of the common forest trees, and other hardy tree kinds, and the most hardy sorts of shrubs; a list of which being comprised in that of the general hardy tree and shrubby tribe, arranged under the articles DECIDUOUS TREES and Shrubs, and EVERGREENS, &c.

Thickets of forest trees designed for woods are also formed with the different sorts of timber trees in considerable extent of wood plantations; both to grow up in full Standards for timber, being planted thick, only four to five or six feet distance, to admit of thinning gradually in advanced growth; and in coppice plantations, closely planted to grow in underwood for cutting occasionally in smaller growth, in a thinning order, leaving a sufficiency of the straightest standards thereof singly, at moderate distances, to run up in full growth for timber trees; the smaller underwood between, shooting up again, affords a cutting every six, eight, or ten years for smaller purposes on different occasions.

The planting of any intended Thicket plantations should be effected with young trees of four, five or six, to eight or ten feet growth; and the shrub kinds proportionably: and in all of which the planting may be performed in the common seasons of autumn, winter and spring.

In respect to culture of Thicket plantations, very little is required, keeping them clear from large over-bearing weeds, while the trees and shrubs are in young small growth; and the whole generally permitted to run up in their natural order below and above, especially when intended merely as close Thickets for any of the purposes before intimated for designs in gardening and planting; or, as before suggested, Thickets that are formed into extensive woods of closely-planted forest-trees for timber and underwood growth, designed principally as profitable plantations; they, after some years advanced growth in some considerable degree to sell for economical purposes, may be thinned gradually in some regular manner for poles, spars, and many other light requisites, as a profitable produce accordingly.

THUYA.

Arbor Vitæ, or Tree of Life.

This genus furnishes beautiful hardy ever-green trees, of the coniferous tribe, for adorning the shrubbery and other hardy plantations, being of erect tall growth, very branchy to the bottom; with the branches spreading,

spreading, and with flat-fanned young shoots closely garnished with very small or minute leaves, placed imbricatum (over one another), and small apetalous male and female flowers separately on the same tree.

Class and order, *Monœcia Monadelphica*.

Characters.] CALYX, male and female flowers apart on the same plant; the males being collected in an oblong, oval amentum, growing opposite on the common foot-stalk; the florets having an oval concave scale for the cup; and the female flowers form an oval cone, having a scale for a cup to every two florets. COROLLA, small florets, without any petals. STAMINA, four very small, monadelphous filaments in the males, having the antheræ adhering to the base of the calycinal scale. PISTILLUM, in the females a very small germen, slender style, and single stigma. PERICARPIUM, an oblong-oval cone, opening longitudinally, composed of nearly equal scales, convex on the outside, and obtuse, each having an oblong seed, surrounded with a membranous wing.

There are only two species of *Thuja* common to the English gardens, being esteemed fine ornamental ever-greens of the tree kind; and which, although exotics, the one principally from America, the other from China, are hardy enough to flourish here in almost any common soil and exposure, and remain in verdure the year round; are therefore in great estimation for all ornamental plantations.

They are both of the very small-leaved kind, with the leaves imbricated or lying over one another like scales.

The species are,

1. *THUYA occidentalis*.

Occidental, or Common American Arbor Vitæ.] Rises with a large upright straight trunk, branching on every side irregularly, forty feet high or more, with the branches growing somewhat horizontally and straggling; being closely garnished with very small leaves, placed imbricatum, or over each other, appearing of a dark dusky-green colour; and with male and female flowers apart, at the sides of the young branches in spring, succeeded in the females by smooth cones, having smooth obtuse scales, containing oblong seeds.

Varieties.] Common American Arbor Vitæ — American sweet-scented — Variegated-leaved.

This tree grows naturally in Canada, in North America, and in Siberia, is of an aromatic and resinous nature; the leaves emit a strong odour; also the wood, which is likewise remarkably durable: hence it is said the

tree anciently derived the name *Arbor Vitæ*, or Tree of Life.

2. *THUYA orientalis*.

Oriental, or Chinese Arbor Vitæ.] Grows with a straight upright stem, branching erectly, close, and regular, thirty or forty feet high, very closely garnished with very small flat leaves, placed imbricatum, appearing always of a bright-green colour; and male and female flowers separately at the sides of the young branches in spring, succeeded by rugged cones, composed of acute-pointed reflexed scales, having ripe seeds in autumn, or towards spring.

Both these trees are natives of distant countries, the first being of North America and Siberia, as before observed, and the other a native of China, inhabitants of humid soils, where they arrive to a considerable stature and magnitude; and from which countries they were many years since introduced into the European gardens, as ornamental trees in the pleasure-ground; being hardy enough to succeed in the open air all the year, in any common soil and situation, and thrive as in their native climate; and are all easily raised from seed, layers, and cuttings, as hereafter directed.

They, in their general growth, assume a picturesque ornamental appearance, being finely branched to the very bottom, always fully adorned with leaves, which, in both species, are of a very minute size, but very closely and curiously arranged in an imbricated manner, exhibiting a perpetual verdure: and in the whole, the trees effect a very distinguishable variety at all seasons.

And as to their flowering, they flower early in the spring; but the flowers being small and apetalous (without petals), they are not ornamental; are universally monœcious, or male and female, separated on the same tree; consisting wholly of scaly calyxes, containing the fructifications, collected into oblong and conic bunches; the males being in oblong amentums, and the females in close oval cones, which become that sort of seed-vessel called a cone, furnishing ripe seed in autumn, or towards spring.—See CONIFERÆ and CONUS.

The first sort, *Common American Arbor Vitæ*, is the oldest resident in our gardens, very distinguishable from the other by the dark-green colour of its leaves; which, sometimes in winter particularly, assume a disagreeable dusky hue.

But the *Chinese Arbor Vitæ* is both of more regular growth, and its foliage continued always of a fine lively bright green, summer and winter,

winter, and is generally a more beautiful tree than the other.

However, both the sorts are in high estimation as fine ornamental evergreens, and most elegant furniture for adorning the shrubbery, and all other garden-plantations, designed for variety and ornament; have also a fine effect disposed singly in decorative borders, &c. and in open spaces of grass, in the shrubbery; in all of which situations, suffering them generally to grow rural, with their full branches, nearly in their own natural way, except reducing with a knife any low straggling or rambling branches occasionally; which is principally all the culture they require.

But these trees may also be employed as timber-trees, in the evergreen forest-tree plantations. See FOREST TREES.

The Chinese Arbor Vitæ is also occasionally planted in pots, both to place among other potted plants to adorn any particular compartment, and to assemble with green-house plants for variety: and to have shelter in winter during its younger growth.

They are cultivated in all the public nursery grounds for sale, and may be transplanted in autumn, or almost any time in open weather, from October until March or April.

Method of Propagation, &c.

The method of propagating both these trees, is by seed, layers, and cuttings.

By Seed.—Both the sorts ripen seed in England, and are also obtained in great plenty from abroad by the seedsmen; and which should generally be sown soon after they are ripe, or as soon as they can be obtained in autumn or spring; sowing them in pots or boxes of light earth, covering the seeds half an inch deep, and place the pots, &c. in a sheltered warm situation, or under shelter of a frame in bad weather; especially if sown in autumn; that the seeds may be protected from severe frost, and continued forward in their vegetative efforts: and thus they will sometimes come up in the spring; which, however, are frequently apt to remain in the ground till the second year; observing when the plants are come up, the pots should be placed in an east border to have only the morning sun, but open to the free air, giving frequent but very moderate waterings all the summer; and in winter remove the pots again to a sheltered place till spring; then may be pricked out in nursery-rows, or if they are very small and weakly, let them remain in the pots another year, placing them in a shady situation during the summer, and in a sheltered place in winter;

and in spring following plant them out in the nursery, in rows a foot or two asunder, to remain to acquire due size and strength, for final transplantation.

By Layers.—The young shoots only of one or two years growth are the proper parts for laying, which may be performed early in autumn, bending down the branches to the earth; and lay all the young wood on each, either by slit, or twist-laying, with their tops only appearing a little above ground; shortening any that have much longer tops than the others (see LAYING): thus they will most of them emit roots in the earth, and be proper plants by autumn following; when, or rather in spring after, they should be separated from the stools, and planted in nursery rows, to remain two or three years, or till of due size for the shrubbery, &c.

By Cuttings.—Autumn is the best season for planting the cuttings, which must be of the young shoots, principally all of the same year's growth; and should be planted in a shady border. Taking therefore opportunity of showery weather, if possible, and chusing the most robust young shoots, cut them off with a small part of the old wood, where practicable, and plant them in rows a foot asunder, closing the earth well about them: they will be properly rooted in one year, fit for planting out in wider nursery-rows.

THYMBRA.

Mountain Hyssop.

A genus furnishing for the green-house, two species of small under-shrubby exotics of diminutive growth, six or eight inches to a foot high, garnished with small, narrow, acute, and spear-shaped, opposite leaves; and the branches terminated by thick spikes and verticillate clusters of small purple flowers, of the ringent or lip kind; having stiff bilabiate cups; a monopetalous two-lipped corolla, with two long, and two short filaments; a four-parted germen, half-bifid style, and four naked seeds ripening in the calyx.

Class and order, *Didynamia Gymnospermia*.

The species are,

1. *THYMBRA spicata*.

Spike-flowered Macedonian Thymbra.] With flowers growing in thick close spikes.

2. *THYMBRA verticillata*.

Verticillated Spanish Thymbra.] With flowers growing in verticilluses or whorls.

Both these species are of small bushy growth, closely set with small leaves; and produce flowers in June or July, sometimes succeeded by ripe seeds; the plants being exotics from warm countries, require the protection

tion of a green-house here in winter: and must therefore be planted in pots of light garden earth, and placed among the green-house exotics, and managed accordingly.

They are propagated by seeds sown in March or April, either in a warm border, and have occasional shelter from bad weather, with glasses or mats; or in pots placed under glasses, or in a hot-bed; and may also be raised by slips, or cuttings of the side shoots in the spring and summer; and by bottom offsets in the same seasons or autumn.

THYMUS.

Thyme.

This genus furnishes the common Thyme, and several other low aromatic plants, mostly perennials of somewhat suffrutescent or under-shrubby growth; some valued as noted pot-herbs, others as medical plants, and some for variety in the pleasure-ground; rising with slender stalks and branches, from about half a foot to a foot or eighteen inches high; adorned with very small leaves, and small ringent flowers in verticillate spikes and heads, terminating the branches.

Class and order, *Didynamia Gymnospermia*.

Characters.] CALYX is monophyllous, tubular, bilabiate, and permanent; having the chaps hairy and closed, with the upper lip broad, plane, erect, and tridentate, and with the lower one ending in two equal bristles. COROLLA, a small ringent petal, having the upper lip short, erect, obtuse, and emarginate, and the under one long, broad, and tridentate, with the middle segment the longest. STAMINA, two long and two short filaments, having small antheræ. PISTILLUM, a four-parted germen, filiform style, and a bifid, acute stigma. PERICARPium, none; four small roundish seeds lodged in the permanent calyx.

There are seven or eight different species of *Thymus*, and of which the following are the most material sorts for general culture; consisting of the common Thyme of our kitchen-gardens,—*Serpyllum*, or Wild Thyme,—Mastic Thyme, &c. each comprising some varieties, and are all low, frutescent perennials, mostly of very branchy bushy growth, and durable in root, stem, and branches, and all hardy enough to grow freely in the full ground, in any common soil of a garden.

1. THYMUS vulgaris.

Common Garden Thyme.] Hath very fibry roots; erect, slender ligneous stems, of very branchy and bushy growth, a foot high, closely garnished with small oval revolute leaves, and all the branches terminated by numerous small, whitish-purple flowers, in

verticillate spikes, appearing in summer, and succeeded by abundance of ripe seed early in autumn.

Varieties.] Broad-leaved—Narrow-leaved—Variegated or striped-leaved.

It is an inhabitant of rocky places in France and Spain, &c. but all the varieties have been long residents of our kitchen-gardens as eminent aromatic pot-herbs, and as medical plants; also occasionally in the pleasure-ground for variety, and sometimes as edgings to beds and borders, on account of its close bushy growth; but its principal estimation is for kitchen and medicinal uses.

2. THYMUS Serpyllum.

Creeping Wild Thyme, or Mother of Thyme.] Hath decumbent creeping stalks, six or eight inches long, or more, garnished with very small, obtuse, plane leaves, ciliated at the base, and the branches terminated by numerous small, purplish flowers, growing in heads, appearing in summer, succeeded by plenty of ripe seeds in autumn.

Varieties.] Broad-leaved.—Narrow-leaved—Broad hairy-leaved—Variegated-leaved—Silver-striped-leaved—Citron-scented, commonly called Lemon Thyme—Greater purple-flowered.

This species inhabits pastures, heaths, and commons, in most part of Britain, and other parts of Europe; and is admitted into many gardens for variety, more particularly the variegated sort. Silver striped and Lemon Thyme, which are sometimes disposed singly in tufts about the borders, &c. and occasionally planted in pots; and also sometimes employed to form edgings; but the Lemon Thyme in particular, is in high estimation for its agreeable odour.

3. THYMUS Mastichina.

Mastic Thyme.] Rises with slender ligneous stalks and branches, a foot long, or more, garnished with oval, obtuse, hoary leaves; and the branches terminated by the flowers in verticillate, downy heads, appearing in June, but rarely succeeded by seeds in England.

Varieties.] White-flowered—Red-flowered.

It is a native of rocky places in Spain, but is an old inhabitant of our gardens, chiefly as a finely-scented aromatic, and for variety.

4. THYMUS Zygis.

Shrubby narrow-leaved Spanish Thyme.] Rises with low, under-shrubby, erect stalks; long, very narrow leaves, ciliated at the base; and flowers terminating the branches in verticillate spikes.

5. THYMUS cephalotus.

Large-headed Portugal Thyme.] Rises with

low ligneous stalks, and stiff hoary branches, half a foot long; spear-shaped hoary leaves, placed opposite; and many whitish flowers, terminating the branches in large imbricated heads, having oval bracteal leaves.

Variety.] With small flowery heads.

All these five species of *Thymus*, and their varieties, are of an aromatic quality, and their chief virtue resides in the leaves, which impart a very agreeable aromatic fragrance. But the first three species are the most noted sorts in the English gardens; though the *Thymus Vulgaris*, or Common Thyme, is considerably the most generally known and cultivated, chiefly for its superior aromatic property, for culinary purposes.

They are wholly perennial, somewhat between a shrubby and an herbaceous nature, wholly abiding in root and top, generally of somewhat bushy growth; their leaves in general very small, but closely placed, and mostly ever-green: the flowers also are very small, monopetalous, and ringent, and collected numerously in whorls, either forming spikes or close heads, each flower succeeded by four seeds lodged in the calyx; and by seeds all the species may be raised, as also by slips and cuttings.

As to the use in gardens of these aromatics, the Common Thyme is in universal estimation as a pot-herb for various culinary purposes; and being easy of propagation and culture, merits a place in every kitchen-garden: which also, together with the other sorts, and their varieties, might be introduced in the pleasure-ground, in assemblage with other small frutescent plants, to embellish the front of flower-borders, shrubby clumps, small and sloping banks, &c. placing them detached or singly, to form little bushy tufts, and in which the variegated sorts, and the Silver Thyme, and Lemon Thyme, particularly form a very agreeable variety together, or in assemblage with the others; and the Lemon Thyme is also in much estimation for its peculiar odoriferous flavour; some of each of these sorts may also be potted, in order to move occasionally to any particular compartment, as may be required, and under occasional shelter in severe winters to preserve the plants more effectually in a lively state; likewise some of the Mastic Thyme: Spanish and Portugal Thymes are also sometimes potted for the above occasion, and to place under protection of a garden-frame or green-house in winter, to continue them more fresh and lively, as observed above of the others.

Sometimes, some of the smaller Thymes are

sown or planted for edgings to particular beds or borders for variety, such as the Lemon Thyme, Silver-leaved and variegated sorts; also, occasionally the Common Thyme; and all kept low, close, and regular, by clipping them at sides and top annually in summer.

But as to the *Common Thyme*, designed for kitchen use, it should be cultivated in beds, or borders, in rows half a foot asunder at least; either the seed sown where the plants are to remain, or young seedling plants previously raised for planting out; or slips of old plants detached with roots, which being planted the above distance, they will soon increase into bushy plants, proper to gather for use: or may be occasionally planted as an edging in the herbary, &c. and in either method the plants will prove abiding, and multiply exceedingly by off-sets; and by which the plants may be propagated at pleasure, by slipping them as above, when wanted for increase; though it is also advisable to raise a quantity of plants every year or two from seed, as the young seedlings possess a stronger aromatic quality than the older plants; and it being sown in spring in a bed of light earth, either broad cast and raked in, or in shallow drills, as directed below, they soon come up, and will be fit for use the following autumn and winter, &c.

In gathering Thyme for use, in private gardens it may be cut or slipped a little at a time, as it is wanted, not stumped too close; but when intended for market, the London gardeners generally pull it up root and all, especially the seedling plants, which remain in the bed where raised, and so raise a fresh crop from seed annually.

Method of propagating all the sorts.

All the species of *Thymus* may be easily raised from seed, and by slipping the roots and branches, and by cuttings thereof.

By Seed.—All the sorts may be raised plentifully from seed, though it is rarely practised to any but the first sort, Common Thyme; and March or early in April is the proper season for sowing it; choosing any light, rich, dry ground; which let be properly digged, and the surface moderately smoothed with the spade, because the seed is very small, and should not be sown too thick, nor covered too deep; this observed, let the seed be sown whilst the ground is fresh stirred, sowing it either broad-cast on the surface, and rake it in lightly, or sow it in flat shallow drills, and earth it over thinly in proportion; it will soon germinate, and the plants will appear in two or three weeks, being careful to keep them

well

well weeded, and give occasional light waterings in dry weather; and thus by June they will require thinning, especially if desirous to have the plants grow stocky, and with bushy full heads, in which they should be thinned, to six or eight inches distance; when, if required, those thinned out may be planted in another place, in rows, six or eight inches asunder, giving water till fresh rooted, observing to keep the whole clean from weeds by occasional hoeing between them in dry days, which will also stir the surface of the earth, and thereby much improve the growth of the plants; and they will arrive to good perfection for use in summer or early in autumn.

But sometimes the market kitchen gardeners about London, who raise large quantities in beds, for the daily supply of the markets, leave the whole thick, without thinning; so when of proper growth in summer and autumn, &c. they pull them clean up root and top together, from time to time, as wanted, and tie them in bunches for sale in the market aforesaid.

However, it is always proper to thin out, or transplant a quantity in single bunches, to grow stocky and bushy, as before observed, to remain for the occasional supply of a family.

Remark, in respect to the varieties, that there is no depending on raising them the same from seed; therefore, when intending to propagate any particular varieties, and continue them the same with certainty, it can only be effected by slips and cuttings as below.

By Off-sets and Slips.—All the sorts multiply both by off-sets of the root and slips of the branches; the rooted slips are the most expeditious method; for the old plants increase into many off-set stems, rising from the root, each furnished with fibres; and that by taking up the old plants in the spring, &c. and slip or divide them into separate slips not too small, with roots to each, and plant them in beds of good earth, in rows half a foot asunder, giving water directly, and repeat it occasionally in dry weather till they have taken root, and begin to shoot at top; and thus they will soon grow freely, and form good bushy plants in two or three months.

But slips also of the branches without roots, will likewise succeed, if planted, any time from March or April until about Midsummer; observing to slip off a quantity of the stoutest young outside shoots, of moderate length, and plant them in a shady border, in rows four or five inches distance, giving due waterings; they will soon emit roots, and become good plants by autumn, when they may be transplanted to where they are to remain.

By Cuttings.—Cuttings of the young branches grow readily the same as slips thereof, there being no other difference, than that the cuttings are the young shoots cut off with a knife, and the slips are slipped off from the side of the branches with the hand only; so that the propagating them by cuttings may be performed any time in spring, or early part in summer, planting them in a shady place, and duly watered, they will readily take root, and grow.

The propagation by slips or cuttings is also the only method by which the respective varieties of the different species are with certainty continued the same, as the plants thus raised will be in every respect similar to the parent.

THYRSUS.

A Thyse.

One of the modes of inflorescence, or manner of flowering, of the aggregate kind; being many flowers collected in a bunch, or sort of close panicle, of an oval or egg-shaped form, having the lower foot-stalks, which are longer, extend horizontally, whilst the upper ones are shorter, and mount vertically, as in lilac and horse chestnut, &c.

TILIA.

Lime, or Linden-tree.

Consist of two principal species commonly known and cultivated, comprising some varieties; all very noted hardy deciduous trees, of formal growth, proper for ornamental and timber plantations, &c. they rising with large upright trunks a considerable height, branching numerously all around, into large regular conical heads, adorned with broad heart-shaped leaves, and small pentapetalous flowers, in loose bunches.

Class and order, *Polyandria Monogynia*.

Characters.] CALYX is concave, five-parted, coloured, and deciduous. COROLLA, five oblong, obtuse petals, crenated at top. STAMINA, numerous awl-shaped filaments, and simple antheræ. PISTILLUM, a roundish germen, slender style, as long as the stamina, and a pentagonal obtuse stigma. PERICARPUM, a globular, coriaceous, quinquevalvular, quinquelocular capsule, opening at the base, containing roundish seeds singly in each locument or cell; though very commonly there is but one seed in the whole, and so situated that the capsule often appears unilocular, if incautiously examined.

Of the two species, one is a European tree, and the other is of America; each comprehending some varieties, and are all very hardy, and of the deciduous tribe.

1. *TILIA crœpæa*.

7 II 2

European

European or Common Lime Tree.] Rises with an upright straight trunk to a great height and magnitude, branching regularly all round into a large conical head; garnished with large, broad, heart-shaped, acute-pointed, serrated leaves, of a light-green colour; and small whitish-green flowers in bunches, at the ends of the branches, having all the flowers destitute of nectaria.

Varieties.] Common green-twigged Lime-tree, having all the young shoots of a light-green colour—Red twigged Lime-tree, having all the shoots of a beautiful red colour, appearing very singular in winter, when destitute of leaves—Large-leaved—Smaller-leaved—Rough or elm-leaved—Variegated-leaved, &c.

The green and red-twigged varieties are tolerably permanent, so that being raised from seed, the plants of each will be mostly similar to the parent tree.

This species grows naturally in England and most parts of Europe, and has been long cultivated as an ornamental tree in garden plantations, both to grow rural, and to form hedge-work regularly trained.

2. *TILIA americana.*

American Black Lime Tree.] Grows with an upright large lofty trunk, branching regularly into a large formal head, having the branches covered with a blackish-brown bark; large, broad, heart-shaped, acuminate, serrated leaves, of a deep-green above, and paler underneath; and small greenish flowers in bunches at the ends of the branches, having all the flowers furnished with nectaria.

Varieties.] Larger-leaved—Smaller-leaved—Carolinian long-pointed-leaved.

Both the species, and their respective varieties, flower in summer; the flowers small, and of inconsiderable appearance, and are succeeded by plenty of ripe seed in autumn, contained in small coriaceous or leathery capsules; and by the seed all the sorts are easily raised in beds of common earth.

These noble trees are quick handsome growers, and obtain a great stature and substance of trunk, particularly the Common Lime, which grows sixty or seventy feet high; and there are accounts of some that have measured ninety feet in height, and more than eight or ten feet circuit in the trunk, with branchy heads proportionably large; but the timber being of a soft light texture, is unfit for any strong purposes; is however excellent for numerous light uses, in the turnery and carving branches particularly.

But for purposes in gardening, the Lime-

tree has been long in great esteem for ornamental purposes, in various garden districts, being valued for its quick and fine picturesque growth and large elegant light-green foliage, that affect a very distinguishable diversity; was therefore in great repute formerly to plant for avenues, and arrange on the boundaries of extensive lawns, and other spacious open spaces, as well as to disperse in parks, &c. both as detached single objects, and in groups, also to plant in regular groves, and for shade; and in all of which, suffered to grow rural, and display their beautiful conic heads: they were likewise used for formal ornamental hedge-rows in large-gardens, and along near the fronts of houses by road sides, &c. and trained regularly by clipping them once or twice in summer; and were also often clipped into pyramids, hemispheres, arches, &c. though for the general part they are considerably better calculated for rural objects in natural standards than for any kind of hedge-work, or other regular training, especially as they generally begin to drop their leaves the earliest in autumn of any other tree, and, when clipped, soon appear naked: I should therefore advise all the sorts of Limes to be employed principally only as rural trees, and disposed at sufficient distances to allow them full scope to branch out all around, and exhibit their heads distinctly in their natural growth; and in which they will always appear considerably the most conspicuously ornamental.

Though from the circumstance of these trees shedding their leaves early in autumn, which is more peculiar to the large than smaller leaved kinds, they are not in such general repute to plant for ornament in gardens as formerly, because in very dry hot summers the leaves often begin falling in July or August, and cause a continual litter for a long time.

However, for the singularity of their handsome growth, and foliage, they highly demand culture both for variety, ornament, and shade; and the red-twigged sort has also an agreeable effect, even in winter, when entirely devoid of leaves.

These trees are likewise proper to plant as forest-trees, as they will soon arrive to timber; and the wood being soft and tough, is valued for making many sorts of household utensils, and for various light purposes in carved and turnery works, as before noticed.

For all of which purposes, these trees may be planted almost any where, as they will prosper in any common soil and exposure; are raised in abundance in all the nurseries, for sale, and may be transplanted any time in open weather, from October till March.

Method

Method of Propagation, &c.

The propagation of these trees is by seed, by layers, and by cuttings.

By Seed.—This ripens abundantly in October, which may be beaten down with a long pole, keeping the green-twigged and red-twigged sorts separate; and may either be sown soon after, or preserved dry and sown till spring; sowing them in a bed or border of common earth, previously digging the ground, and divide it into four feet wide beds; draw the earth off the surface evenly, about an inch deep, into the alleys; then sow the seeds thinly, touch them lightly down into the earth with the back of the spade; which done, directly earth them over, the depth just mentioned, which finishes the work of Sowing.

Being thus sown, they will all come up freely in the spring; at which time be careful to keep the beds clean from weeds, and give some moderate waterings in dry weather, to forward the plants in growth as much as possible, fit for planting out in nursery-rows by autumn or spring following; though, if they have shot rather weakly, let them stand another year: then planted out in rows two feet and a half asunder, by eighteen inches distance in the lines; here to remain three or four years or more to acquire due size to transplant for the purposes intended, trimming off large side-branches from the lower part of the stem occasionally, to encourage their aspiring more expeditiously at top, which must be always suffered to remain entire.

These trees, when raised from seed, generally in the end assume a more handsome and expeditious growth, than such as are raised from layers and cuttings.

When they are from about five or six to eight or ten feet high, they are of proper size for final transplantation: though if any are designed principally as forest-trees for timber, it is advisable to transplant them finally in their destined places, while they are young, and not more than from three or four to five or six feet high.

By Layers.—All the sorts grow freely by this method: and is also or by Cuttings, a very certain method to continue the varieties. For the purpose of furnishing layers, proper stools must be prepared (see STOOLS), and the young shoots of a year or two old, are the proper parts to lay; which should be performed in autumn or winter, by slit-laying, shortening the tops of each layer within a little of the ground: they will all be well rooted by autumn following, and mostly fit to plant out in the nursery in rows, and there managed as the seedling Limes just above directed.

By Cuttings.—Cuttings of all the sorts of Limes will grow, though not near so readily as layers: however, when cuttings are intended, chuse the strong young shoots of the year, in autumn or spring, and plant them in a moist good soil; or any scarce sorts may be planted several together in pots, and plunged in a hot-bed; they will more readily strike root.

TINUS.

Tree Volkameria.

Consist of one species, a tender exotic tree of America for variety in the stove; adorned with oblongish-ovate leaves, and branchy spikes of flowers: having a five-parted calyx and corolla, pitcher-shaped nectarium; nine stamina, single germen and style, and a trilocular berry, with a single seed in each cell.

Class and order, *Enneandria Monogynia*.

The species is,

TINUS occidentalis.

Occidental, or West-India Tinus.] Rises with an upright woody stem of branchy growth, garnished with oblong-ovate leaves; smooth above, sub-villous and nerved underneath: and terminal branchy flower spikes.

This exotic is retained in some of our principal stove collections, a plant or two, for variety; which being planted in pots of rich light earth, placed in the stove, the future culture is the same as other plants of that department, and may be propagated by seeds, layers, and cuttings, in pots plunged in the bark-bed.

TOLUIFERA.

Balsam of Tolu Tree.

It is a large tree of South America, retained here in stoves by the curious for variety; is adorned with large winged leaves, and bunches of pentapetalous flowers.

Class and order, *Decandria Monogynia*.

Characters.] CALYX is monophyllous, bell-shaped and quinque-dentate at top. COROLLA, five petals, four of them being linear and equal, but the fifth is twice as large as the others, and nearly heart-shaped. STAMINA, ten very short filaments, having antheræ longer than the calyx. PISTILLUM, an oblong germen, very short style, crowned with an acute stigma. PERICARPIUM and SEMEN, at present undescribed.

There is but one species, viz.

TOLUIFERA Balsamum.

Balsam of Tolu Tree.] Rises with a strong robust trunk, branching numerously and spreading, thirty or forty feet high, covered with a thick tough brown bark; large pinnated leaves, composed of several pair of ob-

long oval lobes, terminated by an odd one; and at the axillas small bunches of yellow flowers, having four smaller petals, and one large.

It grows naturally in the Spanish West-Indies, and in this country is retained in hot-house collections, a tree or two for variety; must be cultivated in pots, and placed always in the stove, and managed as other tree and shrub exotics of that department.

A balsam of great virtue is extracted from this tree, and is much used in medical compositions.

This tree is raised from seeds obtained from abroad by the seedsmen; which should be sown as soon as they arrive in pots of light earth, and plunged in the bark-bed; and when the plants are come three or four inches high, pot them off separately, giving water, and plunge them again in the bark-bed; and afterwards managed as directed for other woody exotics of the stove. See STOVE PLANTS.

TOMENTOSE Plants.

Such as are covered with *Tomentum*, being a sort of woolly or hoary, downy pubescence, which covers the surface of many plants, more particularly those that inhabit the neighbourhood of the sea; and many of which plants having their leaves and branches so closely covered with this substance as to give them a hoary white appearance.

TOURNEFORTIA.

Tournefortia.

Consists of several shrubby exotics from the West-Indies, and hot parts of America, and cultivated here in stoves for variety; one of which is a climber, the others erect growers, garnished mostly with oval and lanceolate simple leaves, and monopetalous infundibuliform flowers at the sides and ends of the branches.

Class and order, *Pentandria Monogynia.*

Characters.] CALYX is monophyllous, five parted, and permanent. COROLLA is monopetalous, funnel-shaped, with a cylindric tube; globular at the base, and with a spreading brim, cut into five acuminate horizontal segments. STAMINA, five awl-shaped filaments in the mouth of the corolla, having acuminate connivent antheræ. PISTILLUM, a globular germen, simple style, and single stigma. PERICARPium, a globose berry, having four roundish seeds.

This genus received the name *Tournefortia* in honour of M. Tournefort, the illustrious French Botanist.

There are many species in this genus, mostly of a shrubby nature, and perennial in root

and top; and the most noted sorts in the English gardens are the following; all of which being natives of the hot parts of America, require to be continued always in a hot-house in this country.

1. TOURNEFORTIA *volubilis.*

Volubilate-climbing-stalked Tournefortia.]

Rises with long, slender, woody volubilate stalks, twining round any adjacent support, fifteen or twenty feet high; oval, acuminate, smooth leaves, on reflexed foot-stalks; and small white flowers in loose spikes, at the sides and ends of the branches.

2. TOURNEFORTIA *suffruticosa.*

Under-shrubby Tournefortia.]

Rises with an under-shrubby stalk, branching moderately about three or four feet high; oblong, almost spear-shaped, hoary, whitish leaves; and small white flowers in bunches, at the sides and ends of the branches.

3. TOURNEFORTIA *ferrata.*

Serrated-leaved Tournefortia.] Rises with a shrubby, upright, thick stem, branching twelve or fourteen feet high, or more; having oval, serrated leaves on rough spinous foot-stalks; and white flowers in recurved spikes terminating the branches.

4. TOURNEFORTIA *fætidissima.*

Most-stinking Tournefortia.]

Rises with woody stalks and branches, eight or ten feet high, or more, having oval-spear-shaped, hairy leaves; and white flowers, terminating the branches in ramose, pendulous spikes.

5. TOURNEFORTIA *cymosa.*

Cymose-spiked Tournefortia.]

Rises with woody branching stalks, six or eight feet high; large, oval-oblongish, naked, smooth, entire leaves; and white flowers terminating the branches in cymose spikes.

6. TOURNEFORTIA *hirsutissima.*

Most-hairy-stalked Tournefortia.]

Rises with woody very hairy stalks; ovate leaves, foot-stalked; and branching terminal spikes.

7. TOURNEFORTIA *humilis.*

Dwarf Tournefortia.]

Rises with shrubby, low, slender stalks, branching moderately two or three feet high, spear-shaped, close-fitting leaves, and white flowers in simple or unbranched recurved spikes, produced laterally, or along the sides of the branches.

8. TOURNEFORTIA *diffusa.* — Diffused-branching Tournefortia.

These plants remain in leaf, mostly the year round, and flower in spring or summer, &c. succeeded by small succulent berries, containing three or four seeds.

They being all very tender exotics, that require the continual shelter and heat of a stove,

stove, in this country must be cultivated in pots of good earth, and placed in the stove accordingly, and treated like other shrubby exotics of this collection, as directed under the article STOVE PLANTS.

All the sorts may be raised from seeds obtained from abroad, where the plants grow naturally; and it is advisable to sow them as soon after their arrival as possible, in pots of light mould, and plunged in a bark-bed; giving occasional sprinklings of water, and they will probably come up the first year; or if they should remain longer in the ground, continue to keep the mould in the pots all the while moderately moist; and when the plants are come up, and advanced three or four inches high, prick them out singly in small pots, and plunge them in the bark-bed, and continue them constantly in the stove.

Their propagation may also be tried by layers, &c. in pots plunged in the bark-bed.

TRACHELIUM.

Throatwort.

One hardy herbaceous perennial, of the flowery tribe, for the pleasure-ground, compose this genus; rising half a yard high, with oval leaves, and terminal umbellate bunches of monopetalous blue flowers.

Class and order, *Pentandria Monogynia*.

Characters.] CALYX is small, five-parted, and placed above the germen. COROLLA, one funnel-shaped petal, with a long, slender, cylindric tube; and divided at the brim into five small concave spreading segments. STAMINA, five capillary filaments, the length of the corolla, having single antheræ. PISTILLUM, a triquetrous, subrotundous germen, slender style, and globose stigma. PERICARPIUM, a roundish, obtuse, trilobate, trivalvour capsule, of one cell, having numerous small seeds.

There is but one species, viz.

TRACHELIUM *caruleum*.

Blue Trachelium or Throat-wort.] Hath a thick, fleshy, fibrated, perennial root; upright stalks, about half a yard high; garnished with oval-spear-shaped, serrated leaves, and terminated by many small fine blue flowers, in a sort of umbellate clusters in June and July, ripening seeds in September.

It is a native of shady places in Italy and the East, and is cultivated in our gardens to increase the variety of ornamental-flowering perennials; planted in light dry soils, where it will abide several years: also, if sown in the crevices of old walls, ruins, and rock-work, they will flourish, and be of great duration; but when cultivated in rich moist soils,

they are not so durable, often proving biennial.

It is propagated by seeds sown in autumn, soon after they are ripe, or early in spring, in a bed or border of light earth: the autumn sowing will probably come up more freely than that of the spring. Observing when the plants are two or three inches, prick them in nursery-rows six inches asunder, to remain till autumn; then may be transplanted where they are to remain.

TRADESCANTIA.

Virginia Spiderwort, or Flower of a Day.

It is a hardy herbaceous perennial, of the flowery collection, for adorning the pleasure-garden; rising with erect annual stalks, a moderate height, ornamented with very long narrow leaves, and tripetalous flowers.

Class and order, *Hexandria Monogynia*.

Characters.] CALYX, three oval, concave, spreading, permanent leaves. COROLLA, three large, orbicular, plane, spreading petals. STAMINA, six slender, erect, hairy filaments, having kidney-shaped antheræ. PISTILLUM, an oval, obtusely-trigonous germen, filiformous style, crowned with a trigonal obtuse stigma. PERICARPIUM, an oval, trivalvour, trilocular capsule, covered with the calyx, having numerous small seeds.

There are different species, but not more than one in the English gardens, viz. *Common Virginia Spiderwort*; comprehending several varieties, all hardy perennials.

TRADESCANTIA *virginiana*.

Virginia Spiderwort, or Flower of a Day.]

Hath a thick root, furnished with many fleshy fibres, crowned with many narrow leaves near two feet long; amidst them erect, thick, smooth stalks, two or three feet high; garnished with long, graminous leaves singly; and large tripetalous, blue, and other coloured flowers in the varieties, crowning the stalks in close clusters.

Varieties are,] Common pale blue-flowered—Deep blue-flowered—Purple-flowered—Red-flowered—White-flowered.

They all flower in June; each flower is generally but of one day's duration; hence the name *Flower of a Day*; but the same plant continues producing a plentiful succession of new flowers every morning, for a month or six weeks, succeeded by plenty of ripe seed in autumn.

This species, &c. is a native of Virginia, but have been many years in the European gardens as ornamental flowery plants, for the common borders; they may therefore be planted in any of the borders, or other compartments

partments of the pleasure-ground, in which they will abide by the roots many years, producing new stalks annually in spring, and flower very ornamentally every summer; and will multiply exceedingly both by their roots, and scattered or self-sown seeds; even so much as often to over-run the ground, and require trimming in to reduce them within proper bounds.

They are all easily propagated by parting the roots in autumn, or early in spring; also by seed sown in the spring, in any bed or border of common earth, and raked in; and the plants will rise plentifully, and be fit to prick out in summer, to gain strength till autumn, then transplanted finally.

TRAGOPOGON.

Goat's Beard.

Consists of hardy, herbaceous plants, mostly biennials, the principal of which in the gardens is an esculent called *Salsafy*, esteemed for its carrot-shaped, eatable root, and by some for the tender shoots of its young stalks in the spring, to eat like *asparagus*; are mostly tap-rooted plants, with the roots crowned with long narrow leaves, and with upright stalks in spring, of moderate height, surmounted by large compound flowers.

Class and order, *Syngenesia Polygamia Aequalis*.

Characters.] CALYX, a compound flower, having the general cup single, composed of eight spear-shaped leaves, alternately larger and joined at the base. COROLLA, the general flower is compound, imbricated, and uniform, composed of many monopetalous tongue-shaped hermaphrodite florets, five-parted at top. STAMINA, five very short filaments, having cylindric antheræ. PISTILLUM, an oblong germen filiforme style, crowned with two revolute stigmas. PERICARPIMUM, none; the seeds, one in each floret are angular, rough, crowned with down, and lodge in the swollen connivent calyx.

From the circumstance of the seed being covered with a pappus or down, as they remain in the cell, resembling a goat's beard, it obtained the name of *Tragopogon*, or Goat's Beard.

There are ten or twelve species, but many of which being plants of no estimation for use, are but little known; and the most noted sorts are, first the *salsafy*, an esculent, having an eatable root and stalks, &c. and two others sorts principally for variety: the first two sorts are biennials, and the third a perennial.

1. TRAGOPOGON *perrifolius* (Biennial).

Leek-leaved Tragopogon, commonly called Salsafy.] Hath a perpendicular, carrot-shaped, white, eatable root, a foot or more long, crowned with many long leek-shaped entire leaves, closely gathered; and when it runs to seed, rises with upright, hollow, smooth, whitish stalks two feet high, terminated with large compound blue flowers, having the peduncles thickest above, and the calyx longer than the radius.

It flowers in July, and the seeds ripen in autumn, then wholly decays.

This plant grows naturally in meadows in some parts of England, &c. but is cultivated in gardens in the manner of carrots, for its long carrot-shaped root, which attains a moderately large size by autumn and winter, when it is boiled for use, and served to table in different ways, and is very tender and palatable: also the young shoots of the flower-stalk in spring and summer, cut while young and tender, when only a few inches high, are dressed in the manner of asparagus, and served up to table with butter, &c.

It being a biennial, rises from seed in the spring, and attains perfection in the root in autumn following, remaining good all winter, and in spring after shoots up stalks for flower and seed, and the root then becomes sticky and useless, and totally perishes soon after the seeds are ripe.

2. TRAGOPOGON *pratensis* (Biennial).

Meadow Tragopogon, or Greater Yellow Goat's Beard.] Hath a taper fibrated root, crowned with very long, narrow, acute, entire leaves gathered together; upright stalks near a yard high, garnished with long narrow leaves singly at each joint; and terminated each stalk with one large compound yellow flower, having the calyx and radius of equal length.

Variety.] Smaller Meadow Tragopogon, having much narrower leaves, and stalks only a foot high.

Both the varieties flower in June and July, and the seeds ripen in September.

They grow naturally in meadows in England and most parts of Europe; and are sometimes cultivated in gardens for variety, and the young shoots in spring are often gathered and dressed, as observed of the *Salsafy*, being frequently brought to the London markets by the simplers who gather them in the meadows in April and May; or may be raised in gardens by sowing their seed in spring, in rows six or eight inches asunder, and the plants will shoot up for use in the spring following.

3. TRA-

3. *TRAGOPOGON Dalechampii* (Perennial.) *Dalechamp's Greater Hawkweed, or French Tragopogon.* Hath the root crowned with many large, oblong, runcinated, deeply indented leaves; low stalks only about five or six inches high, surmounted by one large yellow flower, having a monophyllous calyx shorter than the corolla, appearing in June or July, and the seeds ripen in autumn.

All these plants are hardy: the first two being biennials, rising one year from seed and the next shoot up into stalk, producing flowers and seed, then wholly decay; and the third is a perennial, durable in root, sending up stalks annually in spring, which decay in autumn.

The first species (*Tragopogon porrifolius*) is the principal sort for general culture, as an esculent, and as such merits culture in every kitchen-garden principally for its roots, as before observed, chiefly for autumn and winter use; they being easily raised from seed in the open quarters, and will arrive to perfection early in autumn, and continue good till they begin to shoot in spring following.

It is much cultivated in the London kitchen-gardens for market, where it is commonly brought in bunches, in autumn and winter.

The other two species are retained in some gardens for variety, and the second sort particularly: is also sometimes cultivated for its tender shoots in spring, as already hinted.

Method of Propagation, &c.

The *Salsify* is raised only from seed sown in spring, in March and April, in an open situation to remain; sowing it either broadcast and raked in, or in shallow drills, eight or nine inches asunder, scattering the seeds thinly, and cover them half an inch deep; and when the plants are come up two or three inches high, thin and weed them by hand or hoe, leaving them eight or ten inches asunder, repeating the weeding as may be required during the summer, which is all the culture they require; and they will have large roots by September or October; when you may begin taking them up for use; and in November, when the leaves begin to decay, a quantity may be taken up and preserved in sand for use in time of severe frost, when those in the ground cannot be dug up.

In spring, when those remaining in the ground begin to shoot, the shoots, when a few inches high, may be cut for use as before mentioned; which, when quite young and tender, being boiled, are excellent eating. Suffer, however, always a few plants to run up to stalk every spring, to produce seed for sowing.

The other two sorts may be raised also from seed like the *Salsify*, and the plants, when a little advanced in growth, may be

planted out if they are required for variety in any particular compartments. If the *Tragopogon pratensis* is required for its shoots, it should remain where sown, and thinned to proper distances.

But the third sort may also be propagated by parting the roots in autumn or spring.

TRAINED TREES.

For walls and espaliers.

The appellation of Trained Trees is to be understood principally of young fruit-trees designed for walls and espaliers, being trained in the nursery to the intended form, by planting them against any kind of walls, pales, reed-hedge, or other close fence, when a year old from the grafting or budding, training them in the manner of wall or espalier trees, for two, three, or more years, till they obtain a good spread of branches, arrived to a fruitful state, in order that any persons, being in haste to have their walls or espaliers covered at once with bearing trees, it may be effected in one season; as the trees thus trained in the nursery, &c. being transplanted in autumn or spring to the places intended, they will both cover the wall or espalier considerably at once, and bear a great deal of fruit the ensuing summer, if a favourable fruit season.

So that, whosoever may incline to have his walls thus at once furnished with bearing trees, without waiting three or four years longer for younger trees attaining a bearing state, may be supplied with such at all the public nurseries, where large quantities are always ready trained for sale, more particularly peaches, nectarines, and apricots for walls; likewise in many places, cherries and plums, &c. also apples, pears, and other fruit-trees for espaliers; and are very eligible both to furnish the walls and espaliers of any new garden, and occasionally those of old ones, either wholly or in part, to bear some fruit, till younger trees, planted untrained, come forward and become fruitful, or may be used occasionally to supply the place of very old trees that may happen to fail or bear bad fruit; in all of which, the planting of Trained fruitful trees may prove so far preferable to quite young untrained and unfruitful ones planted at the same time, in that there will be three or four years difference in the time of their bearing, which is a very material object of consideration; and that, if the Trained Trees are purchased in the public nursery gardens, you are freed from the trouble of the first training them to the requisite form, which requires particular attention the two first years, the effecting of which, often ruins many young wall and espalier trees at first setting off, when under the hands of ignorant practitioners,

tioners; and as to the expense of the purchase, between Trained bearing trees of five to ten shillings, and that of one or two years old untrained ones, of a shilling or eighteen pence, cannot be any great object to persons of fortune, or of any tolerable circumstances in life, at least to furnish some part of the best walls.

Therefore, in both public and private nurseries, it is of much importance to have some of the best sorts of wall and espalier trees always in training for walls, &c. against any kind of fence, either walling, paling, or reed-hedges, both dwarf and half-standard wall-trees; also against ranges of stakes in the open quarters, that there may always be some well trained spreading trees arrived to a fruitful state, to furnish any place as above occasionally with immediately bearing trees of some considerable spreading growth.

When, therefore, it is intended to raise trained fruit-trees for walls and espaliers, a quantity of the best young plants of the respective sorts, both dwarf and half-standards as aforesaid, of one year old, with the first shoots from the budding and grafting entire, should be transplanted in autumn against any kind of fence of any aspect in a free situation, not less than four or five feet high; either a wall, paling, reed-fence, &c. before hinted, placing them five or six to eight or ten feet distance, and here to remain for training as below.

The trees being thus planted, then in spring following, just as they begin to make an effort for shooting, they should be headed down; that is the first main shoots produced last summer immediately from the budding, &c. to be cut down low, with a clean sloping cut upward, to within four, five or six eyes or buds of their origin, or place of insertion in the stock, especially those intended for dwarfs, also the half-standards, if worked on tall stocks; and this heading down both prevents their running up too high with a single naked stem, branchless below, and causes them to throw out lateral shoots from the lower part to fill the wall or espalier regularly with branches quite from the bottom upward; for being thus cut over low, they will soon after push forth strong shoots from all the remaining lower buds, sufficient to give the tree its first proper formation as a wall tree, &c. which shoots, when advanced in length in summer, should be trained along to the fence equally to the right and left, in a somewhat inclined position at full length till next spring, when these shoots may also be cut down to six or eight inches length, to force out a further supply of more branches near the bottom, for there is nothing like being well furnished with branches below, at first setting off, to form a good foundation,

whereby you will be able to keep every part of the wall from the very bottom to top covered with bearing wood; for no part of a good wall should be lost.

So that, agreeable to these hints, continue shortening more or less the two or three first springs on the last summer's shoots, as you shall see necessary, in order to obtain a proper spread of lower branches to give the tree its intended form; though this work of pruning short to obtain laterals may also be performed occasionally in summer, in May or early in June, on the strong young shoots of the year, cutting or pinching them down to a few eyes, and they will thereby throw out lower laterals the same season, and by that means a year's growth is gained.

According as the supply of branches thus gained by the above methods arrive to proper length in summer for training in, they should be accordingly all trained along close to the wall, and if any fore-right or back shoots come out, rub them all off close; leaving, however, all the well-placed side and terminal shoots in every part, and let the whole, or as many as possible, be trained in during this season, to have a plenty to chuse from in the general pruning season of winter or spring, training them close to the wall, &c. equally to the right and left as aforesaid, on each side of the tree, in a spreading somewhat horizontal manner, no where crossing one another but at parallel distances, and mostly all at full length during the summer's growth; thus to remain till the general winter or spring pruning.

In the winter pruning we are to observe, that if more wood was trained up in summer than now appears necessary; or that can be trained in with due regularity, should retrench such superfluities; likewise any remaining fore-right or back shoots and other irregular growths omitted in summer, not eligibly situated for training in, should also be now all pruned out, cutting every thing of the above nature, both superabundancies and irregularities, quite close to their origin; being careful, however, to leave all the regular, well-placed, useful shoots that can readily be trained with proper regularity, without crowding or crossing one another, all of which should also be cleared from all lateral or side shoots, if any; and with respect to their being shortened more or less, or left entire, you will order according to your discretion, agreeable to the above-mentioned hints, and also as noticed below, as the different sorts may require; though if any Rambler extend considerably beyond all the others, it must be reduced, or cut down to some lower shoot, consistent with the general form and extent of the rest of the branches; then,

then, after performing these regulations, proceed to the training and nailing in the whole close to the wall, &c. in exact order, by ranging them equally each way, in a spreading fanned manner, all as straight as possible, somewhat horizontally, no where crossing the branches, but all ranged parallel as aforesaid, one above another, four, five, or six inches distance, according to the sorts, making the opposite branches of each side range as equally as possible in the same position.

Thus, after having obtained a regular spread of branches, proceeding immediately near the head of the stem, sufficient to effect the proper expansion requisite to form a trained wall or espalier tree, they must then be pruned according to the method peculiar to each respective sort of fruit, as directed in their culture, each under its proper genus.—Some requiring the branches shortened annually, others to be trained mostly always at full length.

For in the general course of training and pruning wall trees and espaliers, it must be observed, that some sort of wall trees require almost a general shortening every year of the annual supply of branches, such as peaches, nectarines, and apricots, which always bear their fruit principally on the young year old wood, have that of each year shortened in the winter pruning, to force out a sufficient supply of succession shoots in proper places all over the tree for the future year's bearing: on the other hand, as apples, pears, plums, and cherries do not want an annual renewal of bearing wood, the same branches continue bearing from two or three to many years old; so that, after undergoing the operation of shortening the first two or three years wood, to obtain a spread of lower branches to effect the intended form as a wall or espalier tree, they are not afterwards, in the general course of pruning, to be shortened, but generally always trained at full length, except occasionally shortening some particular young shoot to fill a vacancy. See each kind under its respective head; also DWARF TREES, ESPALIERS, and the article of PRUNING, &c.

The training of espalier trees is effected exactly in the manner as above, only these may also be trained as they stand in the nursery lines, in the open quarters or borders, &c. by ranging some stout stakes in the ground along one side of each tree, not in a continued straight range immediately the way of the row, but those of each tree ranged separate and obliquely, somewhat cross-ways the row as it were, that the branches of the different trees may range beside one another, and thereby have

more room to extend the branches both ways, than the common distance in the nursery lines would admit, if ranged directly the way of the row.

Observe, that as it may sometimes happen some of the trained trees, both of the wall and espalier kinds, in the course of training, may assume a state of vigorous luxuriant growth, either in general, or in some particular parts, producing strong, rampant, rude shoots of a very unfruitful-like nature; they in such cases, should be ordered accordingly in a peculiar manner, till they have exhausted their redundancy of sap, or excessive luxuriance, and effect a more moderate state of growth.

Therefore, where a general luxuriance prevails, while under the course of training or after, it is advisable in the work of pruning to use the knife with moderation, in regard to thinning and shortening, and rather humour the trees somewhat, according to their natural tendency, by leaving the shoots and branches thicker or closer together than the common rule, and all at their full length, especially during the summer's growth; and to such as are usually shortened in winter pruning, as in peaches, nectarines, &c. they should be shortened much less in proportion; continuing those of apples, pears, plums, and cherries, always at their whole length; that in the whole, by dividing the sap amongst a greater number, as well as larger extent of branches, it checks the luxuriance which would take place in a smaller number and less extent of growth. For the more wood we cut out of a generally vigorous shooting tree, and the more the shoots are shortened, as often erroneously practised, the more vigorous will it continue to shoot without ever becoming properly fruitful; and if severe cutting is repeatedly continued, the tree often exhausts itself so greatly by luxuriant shooting, that it suddenly assumes a weak consumptive state.

But that the natural inclination of very vigorous young trees being somewhat indulged at first by training as many branches as can be conveniently laid in, and those that require shortening, cut but moderately, or some very luxuriant ones hardly at all, which being practised two or three years with discretion, it will gradually reduce the trees to a moderate growth, and good state of bearing; when they may be ordered in the common way peculiar to the different sorts.

On the other hand, such trees as are vigorous only in particular shoots, may, in some cases, have such shoots radically retrenched, and in others reserved; that if a very vigorous shoot runs considerably stronger than all the

rest, and seems to support its vigour at the expense of the others in its neighbourhood, it should be retrenched to the very origin, as early in the summer as discoverable; in other cases, if a luxuriant shoot arise in any vacant space, towards the bottom especially, where a supply of more wood is wanted, it may be retained, and pinched or topped down to a few eyes in May or June, it will send out several laterals below, the same season, and instead of one rude luxurious shoot, there will be four or five probably of more moderate growth to fill the vacancy more effectually, and that will much sooner attain to fruitfulness.

Thus far is chiefly all we have to observe relative to the ordering of Trained wall and espalier trees in the nursery, which being in training from three to four or five years, they obtain a handsome spread of fruitful branches, fanned in the requisite regular form for the purposes intended; so as when planted in the garden, they at once cover a large space of walling, &c. bearing good fruit the following summer.

Other particulars respecting their culture, after being planted in their destined places, in the garden, are exhibited under the heads separately of the respective sorts. See also DWARF TREES, ESPALIERS, and PRUNING.

Notwithstanding what we have here advanced respecting the planting of Trained Trees for walls, &c. we would also observe, that for any general plantation, unless good Trained Trees can be readily obtained, from three or four to five or six years old, of a clean free growth, it will be better to plant entire young trees of one or two years old, immediately from the nursery rows untrained, planting them at once where they are to remain, and they will probably root more effectually, and assume a freer growth than stunted Trained Trees, managing them as directed for the Trained Trees, to give them the proper formation, and afterwards agreeable to the rules of pruning directed for the different sorts in their proper places.

But some, to have as great a chance as possible, plant both young untrained trees to remain, and Trained Trees of a bearing state, dwarfs and half-standards between, so as to cover the wall more effectually at once, and furnish a supply of fruit directly, as it were, and until the young ones are trained and arrive to bearing; then according as the trees of both sorts advance in that state of growth, those which appear the most prosperous are retained, and the others are gradually cut away,

leaving the more thriving trees to occupy the wall wholly at last.

In most of the public nurseries, they raise many Trained Trees for sale, which occupy all their close fences of walls, pales, or reed-hedges, planted near together, and after being in training two, three, four, or more years, till of a good spread and become fruitful, they are ready for sale, and fetch a very good price, generally from three to five or ten shillings per tree, according to the sorts, age, and goodness of growth; which pays well for the trouble of training, as any sort of fence of any aspect, openly exposed, serves for training them to the proper form.

TREILLAGE, Or TREILLIS.

A *Trellage* is ranges of stakes and railing on which to train espalier trees; also occasionally for wall trees, where the wall does not admit of nailing the branches immediately against it; likewise for training wall-trees in forcing frames, &c. and may be of different degrees of taste for use and ornament, as well as of different dimensions, from four or five to six or seven feet high, as noticed below.

For common espalier fruit-trees in the open ground, a Treillage is absolutely necessary, and may either be formed of common stakes or poles, or of regular joinery work.

The cheapest, the easiest, and soonest made Treillage for common espalier trees, is, that formed with any kind of straight poles or stakes of underwood, as cut in the coppices or woods, being cut into proper lengths, and driving them in the ground in a range a foot distance, all of an equal height, and then railed along the top with the same kind of poles or rods, to preserve the whole straight and firm in a regular position. See ESPALIER.

Therefore, to form a Treillage of this kind, we must provide some bundles of straight poles or rods, either of ash, beech, or of any other firm durable wood; which, if in the country, may be readily obtained in the adjacent woods or coppices, at a moderate expense, and are sold at many of the timber yards in the vicinity of great towns; choosing such as are perfectly straight and of sufficient substance, i. e. full an inch and half thick, cutting them into six or seven feet lengths, and having pointed them at one end, drive them with a mallet into the ground in a straight range close along behind the row of trees, a foot deep at least, and the same distance in the line; after which saw them even at top, all of an equal level four or five feet high; then let slips of deal or straight poles be ranged horizontally along the top the whole length, and nailed down to each stake,

stake, which finishes the whole firmly in a straight range, as well as gives an air of greater uniformity; and when thus finished, the branches of the espalier trees are to be trained and extended along horizontally from stake to stake, as directed for the different sorts under their proper heads, and in the article *ESPALIER*.

To render the above sort of Treillage still stronger, may run two or three horizontal ranges of rods along the back part of the uprights, a foot or eighteen inches asunder, fastening them to the upright stakes either with pieces of strong wire twisted two or three times round, or by nailing them.

But where a more elegant and ornamental Treillage, of joinery work, is required in any particular district, it is formed with regularly squared posts and rails of hard timber, neatly planed and framed together; having for this purpose deal or oak posts, uniformly worked two or three inches square; but if the main posts are of oak, it will be of particular advantage in respect to strength and durability, fixing the main posts in the ground ten or twelve feet asunder, with smaller ones between, ranging the horizontal railing from post to post in three or more ranges; the first being ranged about a foot from the bottom, a second at top, and one or two along the middle space, and, if thought convenient, may range one between each of the intermediate spaces; then fix thin slips of lath, or the like, upright to the horizontal railing as far as the branches of the trees extend, ten inches or a foot asunder; and paint the whole white in oil colour, to render it more ornamental and durable; and in training the trees, tie their branches both to the railing of the Treillage, and to the upright laths, according as they extend in length on each side.

In either of the above Treillages for an espalier, five feet is generally of sufficient height, as if much higher, the winds, having greater power, will loosen and displace them.

Treillages for wall trees are in some places necessary, where the walls are built with large stones with the joints irregular and far asunder, not affording opportunities like brick walls, for nailing properly in the regularity required; in which case a neat Treillage is eligible, erected all along close to the wall, on which to train and nail or tie the branches in regular order.

This kind of Treillage may also be formed with rods or strong laths, arranged horizontally and upright, chequer fashion, fastened and framed together closely to the wall with iron hooks and pieces of wire, as below.

That being provided with a due quantity of clean straight rods or poles, or squared laths an inch and half thick, and a quantity of hooked iron holdfasts, which are previously driven into the joints of the wall in rows at regular distances, projecting about an inch or inch and half to receive the rods or laths, both horizontally and perpendicularly, nine or ten inches asunder; fixing the first row of holdfasts towards the top, the second near the bottom, and the third along the middle space; this done, and the rods or laths ready, the latter, if thought proper, may be squared and planed, then proceed to frame the Treillage by first fixing the rods horizontally in three rows, in the three ranges of hooks, as above; observing, these horizontal rods should be previously chopped off to nothing at each end, so as they may be readily spliced to one another to extend them in length as far as required; thus, having fixed up the three first rows of horizontal poles, fasten up some uprights or standard rods in front of the horizontal ones, five or six feet distance, then range the remainder of the horizontal laths behind the standards, nine or ten inches asunder, fastening them with wire to the uprights, and being all thus placed and fixed, the rest of the standards are fastened up in front at the same distance, and the whole is made fast with wire twisted round the hooks and the crossings or intersection of the rods of the Treillage.

Or a Treillage of the above kind may be formed of squared laths, about an inch and half thick, planed even and smooth, and neatly framed together by mortise and nailing, &c.

When the Treillage in either of these methods is finished, it is advisable to paint the whole all over with white lead, to render it both more beautiful and durable.

In forcing frames and stoves, where wall trees are intended for forcing, as they are planted both against the back wall, and occasionally in a detached low range forward towards the middle or front space, a Treillage is indispensably necessary upon which to arrange the branches of the trees in a regular expansion, not to train them immediately close to the wall of the flues of that department, but the Treillage erected detached several inches therefrom; formed with light neat squared upright battens, and small horizontal rails, uniformly framed together in a light open erection.

TRIBUS.

Tribes of Plants.

As the whole vegetable creation is distributed systematically into classes, orders, genera,

nera, and species, &c. according to the sexual system, there are numbers of plants in these different artificial arrangements, that, although they differ essentially in the fructification or sexual distinction, yet are nearly allied in some essentials in their general growth, habit, and appearance; and may, therefore, agreeable to nature's system, be divided into Tribes according to the affinity they bear to one another in their nature of growth, either in general, or particular parts, &c.

For example, they may be considered as forming different Tribes according to the following natural orders.

Herbaceous Tribe.] All plants of the herbaceous or herb kind, rising mostly with leaves immediately from the root, and with soft herbaceous stalks not becoming woody, but mostly die at the end of the same year they were produced.

Ligneous or Woody Tribe.] All trees and shrubs having woody durable stems and branches.

Arboreous Tribe.] All plants of the tree kind, rising with an upright main stem to a lofty stature. See ARBOR.

Fruticose or Shrubby Tribe.] Plants of the shrub kind, rising but a moderate height, and divide low into several stems, &c. branching in a somewhat bushy manner.

Deciduous Tribe.] All kind of trees, shrubs, and other plants that cast their leaves in winter.

Sempervirent or Evergreen Tribe.] The various trees, shrubs, and other plants that retain their green leaves the year round.

Annual Tribe.] Annual plants, called annuals, being such as are only of one year's duration. See ANNUAL PLANTS.

Biennial Tribe.] Plants of two years' duration. See BIENNIAL PLANTS.

Perennial Tribe.] Plants that are perennial or of many years' duration, and is applicable both to herbs and trees, though more generally applied to herbaceous perennials. See PERENNIAL PLANTS.

Fibrous-rooted Tribe.] All kind of plants with fibrous roots. See RADIX.

Bulbous-rooted Tribe.] Plants with bulbous roots, such as the onion, tulip, lily, &c.

Tuberous-rooted Tribe.] Plants with thick, knobbed, fleshy roots, such as the anemone, potatoe, and Jerusalem artichoke.

Succulent Tribe.] Plants with fleshy, juicy leaves, as in *sedum*, *cactus*, *mesembryanthemum*, *aloe*, *agave*, &c. See SUCCULENTÆ.

Pinnated Tribe.] All sorts of trees and other plants that have pinnated or winged leaves.

Ensataceous or Sword-leaved Tribe.] Plants with sword-shaped leaves, as in *iris*, *gladiolus*, &c.

Spathaceous Tribe.] Plants producing their flowers out of a spathe or sheath, as in *narcissus*, *galanthus*, and *amaryllis*, &c. See SPATHACEÆ.

Liliaceous Tribe.] Plants producing flowers with six petals, or distinct segments, resembling a lily in form, such as the tulip, &c. See LILIACEÆ.

Papilionaceous Tribe.] Plants that have papilionaceous or butterfly-shaped flowers, such as all the pea and bean kind, and all the other leguminous plants. See PAPILIONACEÆ.

Leguminous Tribe.] Plants having that kind of seed-vessel called a legumen, legum, or pod, as in all the pea, bean, kidney-bean, and other papilionaceous-flowered plants.

Campanaceous Tribe.] Plants with campanulate or bell-shaped flowers, as the *campanula* and *convolvulus*, &c.

Rotaceous Tribe.] Plants with rotated or wheel-shaped flower, as in *lysichia*, *anagallis*, &c.

Umbelliferous Tribe.] Plants producing their flowers in an umbel, as in *angelica*, *anethum*, *pastinaca*, &c. See UMBELLA.

Verticillate Tribe.] Plants producing their flowers in a verticillus or whorl, as in *thymus*, *hyssopus*, *melissa*, *origanum*, *sclaria*, *mentha*, &c. See VERTICILLATÆ.

Aggregate Tribe.] Plants producing their flowers in an aggregate, consisting of numerous small flowers or florets, each having its proper calyx, and all collected into a close aggregate head, as in *scabiosa*, *statice*, *globularia*, &c. See AGGREGATE.

Composite or Compound Tribe.] Plants with compound flowers, consisting of numerous florets contained in one common calyx, as in sun-flower, marigold, aster, &c. See COMPOSITUS FLOS.

Amentaceous Tribe.] Plants producing their flowers in amentums or catkins, as in *populus*, *corylus*, *fagus*, *betula*, &c. See AMENTACEOUS FLOWERS.

Coniferous Tribe.] All trees and plants bearing that kind of fruit called a cone. See CONIFERÆ and CONUS.

Baccaceous Tribe.] All berry-bearing plants.

Pomaceous Tribe.] Plants bearing fruit of the apple kind (*pomum*) as in the *pyrus malus*, *pyrus communis*, *pyrus cydonia*, *amygdalus*, *prunus*, *mespilus*, *punica*, &c.

Nuciferous Tribe.] All nut-bearing plants.

Oleraceous Tribe.] Esculent or eatable plants for the table, and other domestic uses.

Lurid Tribe.] Plants of an ominous appearance, hurtful or noxious; as in *atropa*, *datura*, *nicotiana*, *solanum*, *capsicum*, *digitalis*.

Fungous Tribe.] Mushrooms, and all plants similar.

Graminous Tribe.] Grassy plants: all plants of the grass and corn kind.

TRICHOMANES.

Maiden-Hair Fern.

A genus composed of herbaceous plants of the fern tribe; of which two perennials are retained in our garden collections for variety, one for the green-house and one for the pleasure-ground; rising with compound leafy stalks or fronds, formed of the main foot-stalk of united compound leaves of the pinnated kind; producing minute, imperfectly-visible flowers and seeds on the back of the leaves.

Class and order, *Cryptogamia Filices*.

The species are,

1. TRICHOMANES canariense.

Canary Maiden-Hair Fern.] With frondose stalks; supra-decompound leaves, having the folioles alternate, and these pinnatifid alternately.

2. TRICHOMANES tunbrigense.—Tunbridge Maiden Hair.

Both the species are herbaceous perennials, curious in their peculiar frondose growth; they form a distinguishable curious variety in assemblage with other different plants; the first sort to be stationed among the green-house exotics, and the second in the pleasure-ground compartments; planting the former in pots of light earth, for moving to the green-house in winter; and the latter may be disposed in any dry border, &c. or some also in pots, in order for placing in any particular situation occasionally.

They are propagated by slipping or dividing the roots in autumn or spring; planting the slips as above.

TRIFOLIUM.

Trefoil, or Clover, &c.

The plants are herbaceous annuals, biennials, and perennials, rarely cultivated in gardens, but of great estimation for pasture lands as fodder for cattle; have all fibrous roots, crowned mostly with tufts of small trifoliate, or three-lobed leaves, and send up stalks in summer a foot or two high, and some trailing; adorned also with trifoliate leaves, and terminated by small papilionaceous flowers in heads or spikes.

Class and order, *Diadelphia Decandria*.

Characters.] CALYX is monophyllous, tubular, five-parted at top, and permanent. COROLLA is papilionaceous, having the vexillum reflexed and with short wings and carina. STAMINA, ten diadelphous filaments, having

simple antheræ. PISTILLUM, a nearly oval germen, awl-shaped style, crowned by a simple stigma. PERICARPIUM, a short univalvular pod, containing a few roundish seeds.

There are near fifty different species of *Trifolium*, but many of them being plants of but little value or estimation, either for garden or field culture, are rarely cultivated; so that the most material sorts are the following first two species.

1. TRIFOLIUM pratense.

Meadow Trefoil or Red Dutch Clover.]

Rises with many slender branchy stalks near two feet high; having trifoliate leaves of three large folioles; membranous stipulæ placed opposite round the foot-stalks; and monopetalous reddish-purple flowers in hairy spikes or tufts, at the ends of the branches, in May and June.

Varieties.] Purple-leaved—White flowered.

2. TRIFOLIUM repens.

Creeping White Dutch Clover.]

Hath trailing, creeping stalks, spreading and rooting at the joints; trifoliate leaves; and white flowers growing in umbellate heads at the sides and ends of the branches, succeeded by pods having four seeds.

3. TRIFOLIUM fragiferum.—Strawberry Trefoil.

Both the first species of Trefoil or Clover are found in abundance in our meadow and pasture grounds, and are the only sorts of this genus for general culture in laying down grass-land, and are raised from seed sown in May or autumn as directed below.

They are perennials, though the first often proves only biennial, by sometimes dying away after it has ripened seeds, but the second sort is always perennial, growing very close and thick, is more valuable than the other for continued pasture.

However, the first sort, or red Dutch Clover, grows abundantly, producing wonderful great crops, and is most excellent for laying down land to cut for fodder for all kinds of cattle for two years; for, on account of its biennial nature above-mentioned, it does not always succeed well much longer; though if it is close eaten in summer, or mowed down when coming into flower, it shoots out below from the root again, and often proves somewhat perennial; but considered as a biennial, the farmers commonly sow it with barley in the spring, and when the barley comes off in July or August, the Clover spreads and covers the ground, and shoots up strong early next summer, either to feed off, or mow for hay; and after standing two years, they generally plough the ground again for corn.

But the second sort, creeping white Dutch Clover,

Clover, is more valuable than the other for laying down ground, designed to be continued long in pasture, its seeds being mixed and sown with grass; and as it grows low and close, with trailing abiding shoots, spreading every way, and rooting at the joints, it soon overpreads the ground, and forms a close thick sward, of many years duration; and affords the most excellent feed for all sorts of cattle.

Both the sorts are propagated by seed, which is sold by all the seedsmen, generally at so much per pound; and from six to eight or ten pounds is the allowance for an acre.

The season for sowing it is principally in the spring, in March and April, or may be sown in autumn, any time in August, or early part of September; is generally mixed with grass seeds, and sown broad cast and lightly harrowed in with a short-toothed harrow, and in a day or two after, when the surface is dry, roll the ground with a horse wooden roller, to break the clods and smooth the surface; but the farmers commonly sow these seeds with corn, such as barley, &c. for the sake of making the most of the land, and when the corn comes off, the Clover and grass take their growth, though it will prove much more prosperous and forward if sown alone, as the corn, when very thick and high, is apt to retard its growth, and sometimes spoil the crop.

TRILLIUM.

Herb True-Love of Canada.

A genus furnishing, for the pleasure-ground, some low tuberous-rooted flowery perennials, of but five or six inches growth, garnished with smaller and larger-ovate leaves, and tri-petalous, purple flowers, nodding and erect, in different species.

Class and order, *Hexandria Trigynia*.

Characters.] CALYX, a spreading three-leaved cup. COROLLA, three oval petals, a little larger than the cup. STAMINA, six erect, awl-shaped filaments, topped with oblong terminal antheræ. PISTILLUM, a roundish germen, slender, recurved style, and simple stigma. PERICARPIUM, a roundish three-celled berry, containing many roundish seeds.

The species are,

1. TRILLIUM *cernuum*.

Nodding-flowered Trillium.] Hath a tuberous root with many fibres, the stalk rises single naked, about five or six inches high; with three oval, smooth leaves, spreading out at the top, from between the three leaves; the flower arises upon a short foot-stalk, nodding downward; it is of a whitish-green with-

outside, and purple within; making its appearance in April.

2. TRILLIUM *seffile*.

Seffile-flowered Trillium.] Hath a tuberous root, sending forth many fibres; the stalk rising about the height of the other sort, with three larger oval, pointed, maculated leaves; and a dark-purple flower without foot-stalk; and long, narrow, and erect petals, appearing in April and May.

3. TRILLIUM *erectum*.—Erect-flowered True-love.

These plants require a light soil and shady situation; they are propagated by seeds sown on a shady border, soon after they are ripe; and in the following spring they will make their appearance in summer, must be kept from weeds, and in autumn may be transplanted where they are intended to remain to blossom.

TRIOPTERIS.

(*Triopteris*).

This genus furnishes for the green-house or stove, a climbing woody exotic from the West Indies, garnished with oblong leaves, and yellow flowers with five petals, ten stamina, and three styles, succeeded by trilocular capsules, containing three seeds, furnished each with a membranous wing.

The species is,

TRIOPTERIS *Jamaicensis*.

Jamaica Triopteris.] This being a tender exotic, it must always be kept in pots, and placed among the green-house or stove plants, in which it will effect a desirable variety; and is propagated by cuttings, assisted by a hot-bed; also by layers; likewise by seed.

TRITICUM.

Wheat.

This universally noted genus consists of hardy herbaceous plants, mostly annuals or biennials, valuable for producing that most excellently useful grain called Wheat; are fibrous-rooted plants, rising with grassy leaves, and upright, tall, slender stalks, terminated by close spikes of chaffy flowers, succeeding to spikes or ears of corn.

Class and order, *Triandria Digynia*.

Characters.] CALYX is a bivalvous chaff, having the valves oval, obtuse, and concave, containing sometimes four, several, or but two florets. COROLLA, small bivalvous florets, as large as the calyx, having the outer valve bellied and pointed, and the inner one plane. STAMINA, three hair-like filaments, with oblong forked antheræ. PISTILLUM, a turbinate germen, two capillary reflexed styles, and plumose stigmas. PERICARPIUM, none;

one oval-oblong seed for each floret, obtuse at both ends, and wrapped up in the corolla.

There are many different species of Wheat, the principal sorts of which are,

1. *TRITICUM hybernium*.

Winter or Common Brown Wheat.] Hath long spikes or ears, having four florets in each calyx; and the grains of corn ranged in four rows, in an imbricated manner, with smooth, ventricose, or bellied chaff, almost without beards or awns.

This is commonly sown in autumn to stand the winter; hence called Winter Wheat.

2. *TRITICUM aestivum*.

Summer or Spring Wheat.] Hath spikes with bellied smooth calyxes, ranged imbricatum, containing four flowers each, and are furnished with awns.

This sort is sometimes sown in spring, as it ripens much earlier in summer than the other.

3. *TRITICUM turgidum*.

Turgid or Duck-bill Wheat.] Hath large thick turgid spikes with bellied hairy calyxes, placed imbricatum, having four florets each, and mostly furnished with awns.

4. *TRITICUM polonicum*.

Polonium or Poland Wheat.] Hath long spikes with naked calyxes, having two flowers in each, which are long, and furnished with awns or beards.

5. *TRITICUM quadratum*.

Four-rowed Conical Wheat.] Having oblong conical spikes, armed with long awns or beards.

These are the principal species of Wheat generally cultivated, and which comprehend several varieties, differing somewhat in the form of their spikes and chaff, &c.

But the sort proper to cultivate for general use, is principally the Winter or common brown Wheat without awns; though all the sorts are also occasionally cultivated in different parts of the country.

All the sorts of Wheat may be considered both as annuals and biennials; for considered as annuals, that being sown in the spring, they shoot up to stalk, and produce ripe corn the same year in autumn, and wholly perish soon after; and as biennial, that being sown in autumn, as practised for the Winter, and Turgid Wheat, &c. the plants rise the same year, stand all the winter, and shoot to stalk and corn in spring and summer following, and totally die in autumn, as soon as the corn is ripe.

These plants having spreading fibrous roots, they generally rise with several stalks, especi-

ally if they have room to spread, in which case they often produce from five or six to eight or ten stalks, each stalk terminated by a spike of corn.

They shoot up into stalk in May, and flower in June, consisting of numerous chaffy florets, collected into long close spikes at top of the stalks, each chaff or calyx containing two, three, four, or more chaffy florets, and mostly placed imbricatum or over one another like scales of fish, all along the spike, some entirely without awns, and some with, either less or more, as in their description, and succeed to ripe heads of corn in July or August, fit to reap and stack up for use.

As to the propagation of Wheat, it is effected by seed sown every year, principally in autumn, from August or September until November, and occasionally in the spring; the ground being previously well ploughed for the reception of the seed, allowing generally two or three bushels to an acre; which for the general part is sown broad-cast and harrowed in, and in some places in drills drawn by the drill plough, &c. a foot distance or more, which method of sowing requires a considerably less quantity of seed than the broad-cast sowing, and affords opportunity of horse-hoeing between the rows to kill weeds, and stir the surface of the earth about the plants; which, as having more room, generally grow stronger and produce a greater number of stalks on each root, than such as grow close in the broad-cast; though as the broad-cast sowing is the most ready and expeditious method, it is the most generally practised for sowing Wheat, and almost all sorts of corn.

TRIUMFETTA.

Triumfetta.

Comprises two tender exotics, a shrubby, and an herbaceous plant, natives of the Indies, and retained here in stoves for variety; rise with erect stalks several feet high, adorned with roundish leaves, and pentapetalous flowers in spikes at the ends and sides of the branches, succeeded by round bur-like capsules.

Class and order, *Dodecandria Monogynia*.

Characters.] CALYX, five spear-shaped deciduous leaves. COROLLA, five linear, concave, retroflexed petals. STAMINA, twelve or fifteen awl-shaped rising filaments, having single antheræ. PISTILLUM, a roundish germen, a single style the length of the stamina, having a bitid acute stigma. PERICARPIUM, a globular prickly capsule, having four cells, each containing two seeds.

There are two species, one a woody perennial,

nial, the other an annual, but the former of which is the sort commonly kept in the English gardens.

TRIUMFETTA Lappula.

Jamaica Triumfetta.] Rises with an upright woody stem, dividing upward into a few branches, and grows five or six feet high; roundish trilobed leaves, emarginated at the base; and numerous small yellow flowers, collected in spikes at the ends of the branches.

It must be always kept in pots, and placed in the hot-house or stove, and managed as other ligneous plants in the stove collection.

It is propagated by seed obtained from abroad, sowing it in a hot-bed, or in pots, and plunged in the bark-bed, where the plants will soon come up; which, when advanced one, two, or three inches high, should be planted in pots separately, and placed in the bark-bed of the stove, &c. to remain till well fresh-rooted.

TROLLIUS, Globe Ranunculus.

Globe Flower or Locker Gowls.

They are hardy, herbaceous, flowery perennials for adorning the flower garden; have fibrous roots, crowned with divided leaves and upright annual stalks, two feet high, terminated at top with large polypetalous globular flowers.

Class and order, *Polyandria Polygynia.*

Characters.] *CALYX*, none. *COROLLA*, about fourteen nearly oval connivent petals, and nine narrow, incurved, umbilicated nectariums. *STAMINA*, numerous bristly filaments, having erect antheræ. *PISTILLUM*, numerous germina, sitting close in a columnar form; no style, but the germen crowned by pointed stigmas. *PERICARPIUM*, numerous capsules collected in a head, each having one seed.

There are only two species, both perennials, one an European plant, the other an Asiatic exotic, but both hardy enough to grow in the open ground all the year.

1. *TROLLIUS europæus.*

European Globe Flower, or Locker Gowls.] Hath a black, fibrous, perennial root; sending up many roundish leaves, deeply cut into five segments, which are also divided and notched; upright stalks, about two feet high, dividing into branches upwards; each terminated by one large globular yellow flower, having the petals connivent or converging together, and the nectaria the length of the stamina.

2. *TROLLIUS asiaticus.*

Asiatic Globe Flower.] Hath a fibrous perennial root, crowned with large divided leaves, upright stalks, near two feet high,

dividing into branches, terminated each with one large saffron-coloured flower with spreading petals, and the nectaria the length of the corolla.

Both these plants flower in May very ornamentally, each flower being large and elegant, composed of many large concave petals; which in the first sort particularly, converge or turn inward in a revolute manner, so as to give the flower a perfect globular form; hence is called Globe Flower, and is succeeded by plenty of ripe seed in autumn; but the flower of the second species *Trollius asiaticus*, is not connivent but spreads out, and exhibits the nectariums and stamina, also of a fine saffron-colour, effecting an elegant singularity, and is sometimes succeeded by ripe seeds in our gardens; and by seed both the sorts may be raised, and they also multiply exceedingly by the root, which will be of many years duration, and produce flowers annually.

As therefore those plants, when in flower, effect a singular variety, they merit a place in every curious collection in the compartments of the pleasure-ground; and the season for planting them is in autumn when the leaves decay, or early in spring.

Remarking, however, that as they are natives of moist, shady places, they are generally the most prosperous planted in such situations in gardens, though they will also succeed in any of the general compartments, in common with other hardy perennials.

Their propagation is accomplished by parting the roots, and occasionally by seed.

By parting the Roots.—Autumn, when the leaves decay, is the best season to perform it, or early in the spring, taking up the roots, and divide them into several parts, not, however, into two small slips, and plant them either where they are to remain, or in nursery rows for a year; they will grow freely, and mostly flower the summer following.

By Seed.—Sow it in a somewhat shady border in autumn or spring in shallow drills, and cover it almost half an inch deep, they will readily grow and produce plants fit to plant out in summer, or towards autumn, in rows half a foot asunder, to remain six or eight weeks to acquire strength, then planted out finally.

TROPÆOLUM.

Indian Cress, commonly called *Nasturtium*.

Consists of herbaceous annuals or perennials, of trailing and climbing growth, in estimation for effecting variety in the pleasure-ground in summer, and in the kitchen garden for domestic occasions, in the same season, and one sort for the green house in winter; grow with long trailing stalks; some of slender

slender moderate growth, others strong and rampant, extending many feet along the ground, or upon support, adorned with large roundish peltated or shield-shaped leaves, and numerous pentapetalous flowers all along the branches, of singular structure.

Class and order, *Ostendria Monogynia*.

Characters.] CALYX is monophyllous, horned, coloured, divided into five, acute, erect, spreading segments, and is deciduous. COROLLA, five roundish petals, inserted into the divisions of the calyx; the two upper ones sit close, and the three lower ones have oblong ciliated tails or claws. STAMINA, eight short, declinated, unequal filaments, having erect, oblong, rising, quadrilocular antheræ. PISTILLUM, a roundish, trilobate, streaked germen, single erect style, and a trifid, acute stigma. PERICARPIUM, three roundish, convex, furrowed berries, having three roundish, furrowed seeds, with one side gibbous, the other angular.

There are only two species common in the English gardens; considered principally as annuals, but if sheltered in winter in a greenhouse, will prove of a perennial nature, as exemplified in the double *Nasturtium*.

The species are,

1. *TROPÆOLUM minus*.

Minor or least Nasturtium.] Hath dwarfish slender trailing stalks, branching and extending moderately along the ground, or upon any support; large, roundish, or orbicular peltated, slightly-scalloped entire leaves, of a grey colour, having the footstalk inserted into the centre; and numerous yellow flowers at the axillas, all along the side of the stalk and branches; all the flowers having acuminate petals.

Varieties.] Pale yellow-flowered—Orange-coloured.

2. *TROPÆOLUM majus*.

Major or greater Nasturtium.] Hath large, very long, trailing stalks, branching and extending ten or fifteen feet or more along the ground, or on support, garnished with large, orbicular, peltated leaves, somewhat slightly five-lobed; having the foot-stalks inserted into the centre; and numerous large yellow flowers at the axillas, all along the sides of the branches; with all the flowers having obtuse petals.

Varieties.] Pale yellow-flowered.—Orange-coloured flowers.—Double-flowered, commonly called Double *Nasturtium*, retained generally as a greenhouse plant.

Both these species of *Tropæolum*, and respective varieties, flower in great profusion from June until autumn, or till killed by the frost; and the flowers are of singular form, being, in their single or characteristic state,

composed of five unequal petals, the two upper ones large, and the three lower ones narrow, with long tails joining together, and extended considerably behind; but in the Double *Nasturtium* the petals are multiplied exceedingly, even to the exclusion of the generative organs, and consequently no seed is produced; but in all the common single varieties the flowers are succeeded by great plenty of seed, contained in roundish, berry-like, green fruit. See the *Characters*.

These plants are all hardy enough to grow any where in the full ground all summer, until October or November, but are unable to endure the cold in winter.

They are generally deemed annuals, as they rise from seed in the spring, attain full perfection, flower, and produce seed the same year, and totally perish the ensuing winter, if in the full ground; but if any are raised in pots, and removed under shelter of a greenhouse, or good garden-frame, under glasses, at the approach of cold weather, they will stand over the winter, and may thus be preserved several years, as practised for the double *Nasturtium*; and, like that sort, be propagated also by cuttings, planted in the spring; though as they are easily raised in great abundance from seed sown in spring or summer in the full ground, the preserving them over the winter is rarely attended to, except to a plant or two, by way of variety: and always for the double sort in particular, as not producing seed, nor, if it did, would there be any certainty of continuing its doubleness by that method, is therefore propagated always by cuttings, and kept in pots to have shelter in winter.

All the sorts are cultivated in gardens, both as flowery plants, and for economical uses in their flowers and seed for sallads and pickles; considered, however, as ornamental flowery plants, the common single sorts are dispersed in patches about the borders, and other compartments, and generally trained up to some support, especially the *Nasturtium majus*, or to run on any kind of treillage, railing, hedge, or the sides of arbours, or to be trained against fences, &c. sowing the seeds at once where they are to remain; some in patches, as aforesaid, three or four seeds together, near an inch deep; placing tall branchy sticks, when they come up, for the plants of the large sort particularly to run upon; others may be sown in shallow drills, the same depth, along any kind of fences, as above, on which also to train the plants: and in some particular open compartments may sow some to remain as trailers, and extend along the ground, agreeable to their natural growth: but the *Nasturtium minus* being

of slender, moderate growth, may be sown in patches, &c. and either have support of low branchy sticks, or permitted to run upon the ground. In all of which methods, the seeds being sown any time in spring or summer, they will grow freely, and the plants will soon shoot out stalks and branches numerously, when they should be trained in the order intended, as hinted above.

But as to the double *Nasturtium majus*, this is always considered as a green-house plant; for although it will live in the open air all summer, like the other varieties, it cannot bear the winter's cold, so must be kept always in pots of light earth, and placed among the green-house exotics, placing sticks for their support: thus they will remain ever-green, and effect variety very agreeably, and produce abundance of flowers all summer and autumn; also often moderately in winter; observing during the winter to allow them but very little water, as too much moisture would rot them at this season of the year.

Considered as oeconomic plants, or esculents, before noticed, the common single varieties of both the species are often cultivated for their young leaves, flowers and fruit, the two former for sallads, and the latter to pickle; for the leaves and flowers being of a warm, agreeable relish, are by many greatly esteemed to mix in sallads, the flowers also as garnish to sallads, when sent to table in form: and are likewise in great estimation for garnishing dishes of meat, &c. and as to the fruit, this, when young and green, is an excellent pickle, and for which purpose particularly the plants are cultivated in many gardens.

When, therefore, it is intended to cultivate these plants as esculents, for the flowers and fruit, they may be sown in the kitchen-garden in April or May, either in patches or in shallow drills, an inch deep; and when the plants come up, place branchy sticks for their support, and they will thus supply you with abundance of young leaves, flowers, and fruit, from June or July until October.

Method of Propagation, &c.

The method of propagation is by seed annually, for all the common single varieties, sowing it in spring, the end of March, or in April or May, in patches or drills, in the places where the plants are to remain, as above observed.

But the double *Nasturtium* not producing seed, and being only a variety, is propagated by cuttings of its branches, and by which it will always retain its double property: planting the cuttings any time from April until July, in pots of light earth, and placed in the shade, giving moderate waterings occasionally; or those planted early may be plunged in

any moderate hot-bed, to facilitate their rooting more effectually.

TROWEL. A Garden Trowel.

A Garden Trowel, made of iron, in a hollow or scooped form, is a handy useful implement in taking up and transplanting numerous sorts of small plants and bulbous roots, planting in pots, sowing in patches, &c. and various other similar light works in gardens.

This kind of Trowel being of iron, from twelve to six inches long in the plate, and half as broad, hollowed like a scoop, and fixed on a short handle, to hold with one hand, proves a most convenient, handy tool in a variety of garden operations; for being hollowed semi-circularly, it is remarkably handy in removing many sorts of small plants with a ball or lump of earth whole about their roots, so as not to feel their removal; lifting several sorts of bulbous flower roots, after the flowering is past in summer; planting bulbs in patches or little clumps about the borders; as also for digging small patches in the borders for sowing hardy annual flower-seeds; likewise for filling mould into small pots in planting any sort of plants therein; stirring the surface of the mould in pots, and fresh earthing them when necessary. It is also most useful for filling in earth about plants in hot beds, and under frames, and any small compartments where a spade cannot be readily introduced. And such a Trowel is likewise very convenient for pointing over or stirring the ground between rows of small close-placed plants in beds or borders, &c. and for many other purposes occasionally.

But to suit the several purposes more effectually, it would be proper to be accommodated with two different sizes of scooped Garden Trowels, viz.

A common larger one for general use, being about twelve inches long in the plate, and six broad, narrowing gradually to about four inches at the lower end, not pointed, but somewhat rounding.

A smaller one for particular purposes, about eight inches in the plate, and five broad, narrowing towards the lower end proportionably, as above, to introduce between small plants.

They may be had of different sizes at most of the ironmongers where they sell spades.

TRUNCUS, Trunk, the main Stem of trees and plants.

The Trunk rises immediately from the root, and may be deemed the stock or main body of the vegetable, as it multiplies into branches, buds, leaves, flowers, and fruit. See CAULIS.

The Trunk or Stem is of seven sorts, viz.

Caulis.—The most common species of Stem, both of trees and herbs, or such as produces.

stems and supports the leaves, flowers, and fruit. See CAULIS.

Scapus.—Is an herbaceous, naked Stem, that elevates the fructification only, and not the leaves, as in *Narcissus*, *hyacinthus*, &c.

Culmus.—A straw or haulm, being the Trunk or Stalk peculiar to the grasses and corn, bearing both leaves and flowers; and sometimes flowers and no leaves.

Frons.—The Trunk of the palm and fern tribe, being a compound Stem, formed of a branch and leaf blended together, and frequently also the flower and fruit.

Stipes.—The Trunk or Stem of the mushroom, and other *fungi*.

Pedunculus.—A peduncle, or flowering-stalk, rising sometimes from the root, but mostly from the branches, elevating the flowers and fruit, but not the leaves. See PEDUNCULUS.

Petiolus.—A leaf-stalk bears the leaves only, and not the flowers. See PETIOLUS.

TUBEROUS ROOTS, such as consist of one or more swelled or knobbed tubers, of a solid fleshy substance.

Of the Tuberous-rooted tribe are comprised many plants of the ornamental flowery kind, and some esculents of the kitchen garden; such as (in the former) anemone, ranunculus, filipendula, many sorts of iris, aconitum, pæony, orchis, cyclamen, winter-aconite, day lily, &c. some also with bulbo-Tuberous roots, as in gladiolus, polyanthes or tuberose, ophrys, &c. and of the esculent Tuberous roots, are the potatoe and Jerusalem artichoke; all of which Tuberous-rooted plants are principally perennial in their said roots, or perpetuating and propagating their respective species by off-sets annually.

TUBS, for the containment of large greenhouse exotics, and other potted plants and trees, when grown too large for pots.

In green-house plants particularly, some of the larger-growing sorts, in the process of many years growth, become too large to be contained longer in pots, even in pots of the largest size, which being sometimes both too small for the increased roots of the respective plants, and of insufficient strength to admit of moving them with the plants therein, as may be required, either out or into the green-house, &c. such as large orange and lemon-trees, myrtles, oleanders, and some other tree kinds; and large plants of the great American aloe, &c. so that when any of these, or other similar large-growing trees and plants are advanced considerably in size in their general growth, as above, some proper strong Tubs, of larger dimensions than the above-mentioned largest

pots containing the plants, should be prepared ready in proper time, in which to shift them accordingly.

These Tubs are made, according to directions, by the coopers, proper for this purpose, of proportionable size, according to that of the different sorts of plants for which they are intended; made somewhat in the garden-pot form, a little wider at top than bottom, a foot and half to two and a half deep; the width in proportion; constructed of the strongest thick staves and bottoms, and well hooped with iron, and with two iron handles at top, one on each side opposite, by which to move them, containing the plants, on different requisite occasions; the handles being strong and generally hooked, especially very large Tubs, in order to receive a pole in each occasionally, that the Tub and plant together may thereby be more readily moved as required; the bottom of the Tubs having auger holes bored in different parts, at regular distances, by which to discharge the superfluous moisture after watering, &c.

Having the Tubs ready for this occasion of shifting therein large-grown plants of the above description, the plants should be removed from their present pots, with the ball of earth about the roots entire; and having earthed the bottom part of the Tub, set the plant, with its whole ball of earth therein, filling up properly around, and an inch or two over the top of the ball with more fresh mould, and then watered.—See *Shifting Plants in Pots*, &c.

Probably, after some years considerably advanced growth, the same sorts of large plants will require shifting into larger Tubs, which should be provided accordingly of proportionable dimensions.

But when plants in Tubs are occasionally shifted into others of some considerable large size, according to the nature of growth of the said plants, the said Tubs may probably serve as their final or last, in which they are mostly always to remain; except occasionally shifting them once in two or three years, into a little fresh earth in the same Tubs, as intimated under the article *Shifting Plants*.

Though, as in the course of time the Tubs will decay, either in part or wholly, when they should either be repaired, where practicable; or, if not, replaced with entire new ones of the same, or advanced sizes, as may be judged expedient.

Sometimes plants of considerably large growth require Tubs of very capacious dimensions, as casually occur in large old plants of the American aloe; and sometimes the said

Tubs

Tubs and plants together are so exceedingly large and heavy, that they cannot be readily lifted or moved as required by the common method, the Tubs are obliged to be fixed on low four-wheeled trucks, for moving them thereby out and into the green-house; though this is not very common. I, however, have had such under my care, particularly some superbly large plants of the common and striped-leaved agave.

Any large, curious, hardy flowering-shrubs, or ornamental evergreens, of the full ground, being occasionally potted, for moving therein to adorn particular compartments, and have been shifted by degrees, as required, into pots of the largest size, and that, by their increased growth, are become too large for the said pots, they, if intended to be continued for the occasion as above, should be shifted into Tubs of the before-mentioned kind.

TUBUS, a Tube or Pipe, being the lower, narrow, hollow part, of a monopetalous flower.

TULBAGIA. (*Tulbagia*). This genus furnishes for the stove two species of tender herbaceous exotics, garnished with filiform and lance-linear leaves, and funnel-shaped, liliaceous flowers, having a six-parted corolla, a three-leaved Nectarium, six stamina and one style; succeeded by a capsular seed-vessel.

Class and order, *Hexandria Monogynia*.

The species are,

1. TULBAGIA *alliacea*.

Alliaceous, or Garlick Tulbagia.] With small, narrow, somewhat thread-form leaves.

2. TULBAGIA *cepeacea*.

Cepaceous, or Onion Tulbagia.] With leaves lance-shape-linear.

Both these species are tender exotics, requiring a constant residence in the stove, in which they will effect an agreeable diversity; and may be propagated by seed, slips, and offsets.

TULIPA. Tulip.

This most noted genus furnishes a grand collection of bulbous-rooted flowery perennials of admirable beauty and elegance, consisting of about two or three species, one of which in particular produces most beautiful and superb flowers, and comprehends a prodigious family of varieties, even to the amount of thousands, having all large bulbous roots, crowned with long, broad, spear-shaped leaves, and each an erect flower-stalk, from half a foot to a yard high, terminated with one large, liliaceous, bell-shaped flower.

Class and order, *Hexandria Monogynia*.

Characters.] CALYX, none. COROLLA is bell-shaped, and composed of six large, ob-

long, oval, concave, erect petals. STAMINA, six shortish, awl-shaped filaments, having oblong, quadrangular, erect antheræ. PISTILLUM, a large, oblong, trigonal germen, without a style, and crowned by a triangular, three-lobed stigma. PERICARPIMUM, a trigonous, trivalved, trilocular capsule, containing many plane or flat semicircular seeds, resting upon one another in a double order.

There are three species, two of which only are known in the English gardens, and one of these in particular (the *first sort*) is famous for the extraordinary beauty of its large noble flowers, most elegantly striped and stained with a vast diversity of rich colours, in a thousand various forms; constituting so many different varieties, all very great ornaments to our gardens in April and May.

1. TULIPA *gesneriana*.

Gesner's Turkey Tulip of Cappadocia, or common Garden Tulip.] Hath a large, oblong, solid, bulbous root, covered with a brown skin, sending up long, oval-spear-shaped leaves; an upright, round stalk, from half a foot to a yard high, garnished with a few leaves, and its top crowned with a large bell-shaped, erect, hexapetalous flower, of almost all colours and variegations in the different varieties.

Varieties.] Early Dwarf Tulip (*Præcocca*), rising with short stalks, from five or six inches, to ten or twelve high, with smallish flowers.—Tali, late-flowering, or common Tulip (*Scrotina*) rising from about half a yard to two or three feet high, with large well-formed flowers.—Double Tulip, rising a foot or two high, or more, having large double-flowers.—Whole-blowing, or one coloured Tulip, being all of one original colour, either purples, reds, violets, greys, copper-colours, yellows, &c. which gradually break into numerous variegations.—Variegated Tulip, comprising innumerable varieties, in respect to the different colourings, variegations, and stripes.

Each of the above principal varieties of this species comprehends numerous intermediate ones, in respect to the colours and variegations of the flower; each, however, having been originally all of one colour, especially seedling-raised bulbs, which, when arrived to a flowering state, each separate flower being either wholly red, purple, violet, grey, brown, black, or yellow, &c. without any variegations or stripes, consisting of one-coloured flowers, with white bottoms; with yellow bottoms; and some also with blue, purple, and blackish bottoms; all of which, whilst they retain this original same colour, are in the florists'

florists' language, called *Whole Blowers* or *Breeders*, because each flower is wholly of one colour; and the roots being planted a year or two in prepared soils, to breed, or dispose them gradually to produce flowers that break from the original single colour into variegations and stripes, in various different forms; and are then called *Breakers*, or *Variegated Tulips*, each different variegation constituting a distinct variety; consisting of flowers with white bottoms, broken with brown stripes, with blue stripes, violent stripes, rose stripes, red stripes, &c. separated by streaks of white and other colours, variously disposed.—Yellow bottoms, broken with different reds, crimsons; and golden-yellow flakes, and various other colours.—Some also with blackish purple bottoms, &c. broken with stripes of dark colour, yellow, and tints of red; so that in these sorts of *Breakers*, or *variegated Tulips*, with white and yellow bottoms particularly, there are also, white and red-striped flowers—white and purple-striped—white and violet-striped—white and rose-striped—white and brown-striped—violent and white-flaked—red and white-flaked—red and yellow-flaked—brown, yellow, and red-flaked,—and numerous other intermediate variegations and stripes, variously disposed in an endless diversity.

Thus the *Breakers* or *variegated Tulips* are diversified with an infinity of colours in innumerable different ways, forming so many different varieties, the principal of which are by the florists distinguished by various names, either of some great personages, eminent florists, places of their original growth, &c. but as vast numbers of new varieties are annually obtained from seedlings, in so many different places, distinguished by various new names, and old ones rejected; and often the same flower, with a different name, that the varieties being thus multiplied innumerable, without end, it would be impossible to give any correct list here of the names of such a numerous tribe so often changing every where.

2. TULIPA sylvestris.

Wild European Tulip.] Hath an oblong bulbous root, tending up long, narrow, spear-shaped leaves; and a slender stalk, supporting at top a small yellow flower, nodding on one side, having acute petals.

Both these species of *Tulipa* are hardy perennials, durable in root, or at least, although the old bulb decays annually, it perpetuates its species by off-sets, and is annual in leaf and stalk; which rising from the bulb early in the spring, arrives to a flowering state in

April and May, each plant having only one flower, supported on the top of the naked stalk, without any calyx or cup, and consists of six large petals, three within and three without, mostly in an erect position; the whole together forming a sort of large cup, either bell or egg-shaped; though the *Double Tulip* have the petals multiplied in an indeterminate number. All the varieties are succeeded by plenty of ripe seed in July and August, contained in an oblong capsule of three cells, having the seeds placed on each other in double rows, (see the *Characters*); and by the seeds numerous new varieties may be raised; which, however, will not attain a flowering state till they are from six to seven or eight years old, and after that will require two or three years to break into variegations, when the approved varieties may be marked, and increased by off-sets of the root, as directed in their *Propagation*.

It is remarkable, that although the Tulip may be said to be a perennial plant, yet, after the bulb arrives to a flowering state, the same individual old root or bulb does not always remain to flower again, but gradually wastes away, as may be observed by its relics at the lifting season, when the flower and stalk decays in summer; but, previous to its dissolution, it affords from its sides a supply of suckers or off-set young bulbs, to perpetuate the species; and one of which being large, and similar to the parent bulb, is capable of flowering equally strong next year; so that at the end of many years, what is often still supposed to be the same individual bulb, is in reality another in every respect.

Remark, that of the two species of Tulip, the first sort, *Tulipa gesneriana*, or common Garden Tulip, and its vast train of varieties, is the sort so generally cultivated for the ornament of our gardens, and so much admired for its great variety and beautiful appearance, grows freely in the open ground in any common soil of a garden, and proves a very great decoration to the beds and borders of the pleasure-ground, for six weeks or two months in spring, by different plantings of early and late sorts; planting the principal part in autumn, and the rest towards Christmas, and in January or early in February; the autumn plantings will come earliest into bloom, and flower the strongest; and the others will succeed them in flowering; observing that in summer, when the flowering is past, and the leaves and stalks assume a state of decay, the bulbs of the choicest varieties are generally taken up, the off-sets separated, and the whole cleaned from the stalk, earth, and any loose skins

skins of the bulbs; then put up in the dry till October or November, and then planted again for the future year's bloom.

As to the second species, *Tulipa sylvestris*, it having but inferior beauty, in comparison with the others, is not near so generally known or cultivated; though it was formerly in estimation, before the Turkey Tulip was so general, and is still to be seen remaining in many old gardens; and it also deserves culture in modern ones, both for its early flowering, and to increase the variety, in concert with the common Tulip, and other spring flowers in the open borders.

However, all the sorts of Tulips being very hardy perennials, they will prosper in any common soil of a garden, and are admirable fine ornaments for adorning the borders and flower-beds; the roots being planted in autumn, the common sorts in rows or patches, towards the front of borders, and the fine varieties in beds by themselves, as hinted in the articles *General Observation* and *their General Culture*.

Arrangement and Merit of the different Varieties.

As we formerly observed, the first species, Common Tulip, &c. is the florist's delight, and merits universal estimation for its vast profusion of beautiful varieties, which may be divided into two principal classes, viz.

1. Early or Dwarf Spring Tulips (*Præcocæ*).

2. Late flowering tall Tulips (*Serotina*).

Remark however, of these two classes, that although the first class (early Tulips) is in great estimation for its early bloom and lively colours, yet the second class is in still higher repute for its stately growth and great diversity of rich colours, and profusion of varieties; and is the most universally cultivated. See each class as below.

Early Tulips.—The early Tulips are among florists distinguished by the appellation of *Præcocæ* (early), because they flower early in the spring, a month or more before the others; are much shorter stalked, and the flowers smaller; but are in great reputation for their early bloom, and their gay lively colours, both of single colours, and broken into flaked variegations; such as reds, crimson, scarlet, carnation, violets, purples, yellow, &c. with flowers of each, edged and flaked with red, yellow and white, in many diversities.

The bulbs of these early sorts being planted in any good, light, rich earth, in a warm situation, in the end of September, or any time in October or November, in yard-wide beds, in rows, six or eight inches asunder, and about

three inches deep, they will rise early in the spring, and arrive to flower in March, continuing till the late Tulips come into flower.

Though as the early dwarf sorts are also well adapted for forcing, they may still be blowed earlier, by either planting the roots in pots or boxes in autumn or winter, and place them in a stove, or a hot-bed, whereby they may be forwarded into bloom in January and February, or earlier; and a succession continued till the natural ground-bloom arrives; or may place a quantity of bulbs upon phial-glasses of water, in autumn or winter, one bulb in each glass, and place them either in any warm, light room of a house, near the windows, or in a green-house or stove, by which they will also flower very agreeably in winter, and early in spring; they being the best adapted sorts of Tulips for all these methods of blowing.

They are sold by the seedsmen and nurserymen in great collections of different sorts, by names, chiefly Dutch or French, as may be seen in most of the flower catalogues.

Late-flowering Common Tulips.—This class is denominated late-flowering, and by the florists called *Serotines*, because they blow later in the spring, a month or more, than the *Præcocæ*, i. e. not coming into flower before the end of April, and in May and June; are all of tall growth, supporting large flowers, and furnish an almost endless variety in the vast diversity of colours, after they break from whole-blowers into variegations and stripes, exceeding all others of the Tulip kind in beauty and elegance of flower.

Tulips are also subdivided into other classes, such as Whole Blowers, and broken or variegated Tulips.

Whole Blowers or One-coloured.—These are seedling Tulips, having flowers wholly of one colour; they being raised from seed to a state of flowering, the flowers often remain two, three, or more years of one colour, before they break into variegations; which are also divided into classes, according to the Dutch florists called,—1. *Bizarres*; being generally almost of a brown copper colour, having at the bottom a small round spot, either yellowish, or black mixed with a little yellow, which when broken into different colours, becomes *Bizarres* with yellow bottoms.—2. *Violetes*, being either all of a purple-violet, pale-violet, grideline, cherry-crimson, or red; having the spot at bottom, either a clear white, or blackish-grey mixed with a little white; and their production when broken into different colours become Tulips with white bottoms, called by the Dutch, *Bybloemens*.

Broken or Variegated Tulips.—Such that are broken

broken from the original single colour of the whole-blower or breeding Tulips, into variegations and stripes of different colours; observing, they generally break into different variegations according to that of the former single colour; generally however, either wholly expelling the original colour of the breeder, or leave but very little remains thereof, which is a desirable requisite in these kind of flowers among professed florists; and when thus broken or variegated with different colours, they exhibit themselves variously mixed, striped, flaked, feathered, marbled, spotted, edged, &c. a thousand different ways in an admirable manner; and are by the florists divided into the following classes, called by the Dutch—

Baguettes.—Tulips with white bottoms, striped with brown—Tulips with a white bottom, broken with dark brown stripes, &c.—numerous varieties, variously striped.

Bybloemens.—Tulips with a white bottom, striped with violet and blackish brown, &c.—White bottom Tulips striped with rose-colour, vermilion, and ruby.—Many varieties.

Bizarres.—Yellow bottom Tulips, striped with various colours—numerous varieties.

Of each of the above classes of the Tulip, there are numerous varieties in the different variegations of the flowers, both of the common tall and smaller dwarf kinds; variously striped, flaked, and tinged with different colours of reds, yellows, whites, purples, &c. in innumerable diversifications, curious and beautiful.

Double Tulips.—Many different varieties in the colouring of the flowers, such as Yellow-flowered—Yellow and Red—White and Red striped—White and Blush coloured—with many intermediate variegations.

And Parrot Tulips.—Having long hooked petals of the flower, consisting of Yellow-flowered—Red-flowered—Yellow and Red striped, &c.

Among florists the principal properties requisite in the capital varieties of the common large Tulips of the Serotine kinds, particularly to constitute a fine flower, are—The stem must be tall, from half a yard, to two or three feet high, or more, being proportionably thick and strong; the flower large, composed of six petals, as in the characteristic state, these being broad, thick, rounded at top, and stand firmly erect without turning much inward or outward, but so as to cup well, and give the flower a regular form. The colours and stripes of the flower must be bright, arising unmixed, regularly and distinct from

the bottom, with but little or none of the original single colour remaining.

The colours in greatest estimation in the variegated or striped tulips, are the blacks, golden yellows, purple violets, rose, and vermilion, each of which being variegated various ways; and such as are striped with three different colours distinct and unmixed, with strong regular streaks, with but little or no tinge of the breeder, may be called the most perfect Tulips.

Though it is rare to meet with a Tulip possessing all the properties, yet have sufficient perfection to render them of high estimation as fine flowers.

As to the manner of obtaining this wonderful variety of colours in Tulips, it is often accomplished principally by nature alone, which however is sometimes assisted and forwarded by some operations of culture, such as, that in the first place, when the seedling bulbs of the whole-blower or breeder are arrived to full size, and have flowered once, to transplant them into beds of any poor dry barren soil, in order that by a defect of nutriment in the earth, the natural luxuriance of the plant may be checked, and cause a weakness in their general growth, whereby they generally in this state, gradually change and break out into variegations, some the first year, others not till the second or third; and according as they are thus broke, they should be planted in beds of good earth, as hereafter hinted.

Another method to assist nature in effecting the work of breaking the breeding Tulips into diversified colours, is to make as great a change as possible in the soil; if they were this year in a light poor soil, plant them the next in a richer garden mould, and another year in a compost of different earths; or transplant them from one part of the garden to another, or into different gardens, &c. all of which contributes in assisting nature in producing this desirable diversity of colours and variegations.

The double Tulip is also a variety of the common Tulip, is very beautiful, though not in such estimation among the florists as the common single variegated sorts; not possessing such a profusion of variegations in the colours and regularity of stripes; they however exhibit an elegantly ornamental appearance, as they rise with an upright, tallish, firm stem, crowned with a very large double flower composed of numerous petals, multiplied in several series one within another like a double pæony, but far more beautiful in their diver-

ety of colours, variegations, and stripes of white and red, or yellow and red, &c. so that they highly deserve culture both in beds alone, near the other sorts, to increase their variety; also to plant in patches about the borders, in assemblage with the common large variegated Tulips, as they blow nearly about the same time, i. e. April and May.

General Observations.

As we before hinted, all the varieties of Tulips succeed in the open ground, in beds or borders of any common garden-earth planted as hereafter directed.

The roots are sold in full collection, consisting of numerous varieties, at most of the nurseries and seedsmen's, who both propagate them themselves by off-sets and seed, and import vast quantities annually from Holland; the Dutch being famous for raising the grandest collections of the finest Tulips, and other bulbous flowers, in the greatest perfection, for the supply of almost all the other European gardens; distinguishing every variety in their vast collections by some pompous name or other, as before observed, arranged in regular catalogues; charging prices in proportion to their estimation, which formerly was so great among the Hollanders themselves in particular, that there are accounts of a single root being sold for from two thousand to five thousand five hundred guilders; however, they are now more plentiful, and are sold at from five or ten shillings to so many pounds, per hundred, and sometimes considerably more for very scarce capital sorts; and the most eligible season to buy in a collection, is early in autumn, i. e. any time from August or September till November.

And as to the season for planting them is in autumn; about October and November is the most proper period for putting in the main collection, to blow in April and May following; but, in order to have a later bloom by way of succession, some may be planted in December, January, or February; though they will not flower near so strong as those planted in autumn or the early part of winter.

But the early dwarf Tulips should generally be allowed a warm, sheltered, sunny situation, on account of their early rising and flowering in the spring, whilst the weather remains cold and pinching; generally also always kept separate and planted in beds by themselves, not promiscuously with the late tall Tulips; for as their stature and time of flowering are different, they would not distinguish themselves to proper advantage: may also distribute

some in the fronts of warm borders in patches, in concert with anemones, ranunculuses, &c.

However, as to the late Tulips or *Serotines*, they may be planted in any of the common beds or borders, as they will be in no danger from any inclemency of weather.

But the fine or more valuable sorts in general, both early and late kinds, are commonly deposited mostly together in beds by themselves; the early and late kinds in separate beds, in rows, eight or nine inches asunder, that they may exhibit a grand blow together, and in which they can also be readily defended, if necessary, especially when in bloom, from heavy rains, and the scorching sun, occasionally.

Though as to the inferior or common sorts, or even any of the capital varieties, they may be distributed about the common borders in assemblage with other spring flowers, both of the bulbous and other kinds: planting them in patches, three or four roots in each, in which they will have a fine effect when in bloom.

Their General Culture.

First, with regard to soil and situation, it has already been suggested, that all the varieties of Tulips will grow very freely in any common light mould that lies dry in winter, generally preferring an open sunny exposure; though nothing can hurt a Tulip but too wet soils, so that if the situation of the ground in any place proves naturally low and wet, the beds must be raised a few inches above the common level; though the florists often prepare studied composts to form beds for their finest Tulips (see *COMPOSTS*). However, to save trouble and expense, they will be found to succeed in any good garden earth; only observing it is not advisable to plant the fine sorts particularly, more than one or two years together in the same bed or earth, without making some alteration in the soil, either wholly or in part, by removing some of the old, and adding an equal portion of fresh light earth, either from any of the kitchen-garden quarters, or any compost heap, or elsewhere, that is good, and wheel away the old earth to supply the place of the new; and thus, by renewing the soil, less or more, the Tulips may be expected always to blow stronger and fairer in proportion; though this is only advised for the finest sorts that are planted together in beds; those intended to decorate the open borders, may be planted any where as the soil happens, and they will also flower very well.

But to proceed in preparing the beds for the choicest

choicer sorts, as formerly observed; let the ground be well digged one or two spades deep, and form the beds three or four feet wide, with alleys one or two feet wide between bed and bed; and rake the surface of the bed even, ready for the reception of the bulbs.

Then, when the beds are thus prepared, proceed in a dry day to plant the bulbs of Tulip roots, in rows, either by bedding-in, drilling, or dibble-planting (see PLANTING); having for the latter method, a thick, blunt-ended dibble to make the holes sufficiently wide below as above, to admit the bulbs clean to the bottom; marking out lines lengthways the bed, eight or nine inches asunder, in which plant the roots singly, three or four inches deep, and six distant in the lines; and when they are all thus planted, rake the surface of each bed smooth.

Those you intend for the open borders may either be planted in a line, a foot or eighteen inches from the edge, or disposed in patches or little clumps, three or four roots together, in a patch of six or eight inches diameter, some patches forward, others more backward, to effect a greater diversity.

After the Tulips are planted, they require no care till the following spring and summer; as being in no danger from the rigours of winter, they do not want covering; and in spring, no more is required than keeping them clean from weeds; except you choose to protect the buds of the choicer kinds in the beds, by covering them in cold nights and severe weather, with mats, supported on hoop arches, though it is not absolutely necessary; or when the bedded Tulips are come into flower, if you would protect them to preserve their beauty as long as possible, it may be effected by shading them from the noon-day sun, heavy rains, and tempestuous winds, with a shade or awning of canvas or mats erected across the beds, which by some is made high like a tent, to walk under and view the flowers at pleasure; though we would also observe that these flowers will blow in great perfection without all this care of covering; only that by protecting some of the finest sorts growing in beds, the blow may be prolonged a week or fortnight longer in full beauty, than those that are fully exposed; being careful to remove all covering as soon as ever the flowers begin to fade, to admit the free air, rains, &c. for the benefit of the roots.

When, however, the flowering is past, or as soon as ever the flowers are faded, it is proper to cut off the head or seed vessel of the fine varieties particularly, that it may not rob the root of any nourishment, which will

thereby increase more considerably in size and strength.

Though when intended to save seed for sowing, some heads of the stoutest plants must be left to ripen.

The next care is in June, when the leaves and flower-stem are decayed and withered, determining that the roots have ceased growing, and draw no nourishment from the earth; at which period of rest is the time for lifting or taking them up out of the earth, in order both to separate the increased off-sets, and to reserve them out of ground till autumn, that they may have some respite from growth, as well as to be planted in fresh-prepared beds to promote the merit of the future year's bloom; and which work of lifting these bulbs should be practised annually, at the above period, to all the choicer kinds, in the beds, and also to the more inferior sorts in the borders, &c. at least every other year, if they appear to have increased by off-sets considerably. See BULBUS.

Therefore, at the above period of the decay of the stem and leaves, taking the opportunity of dry weather, proceed with a garden trowel to dig them up carefully one and one, with all the off-sets to each; spreading them in a dry, airy, shady place, here remaining two or three weeks out of the sun and wet; but exposed to the free air, they will gradually dry and harden; then detach the off-sets and all adhering earth, and the outer decayed skins or husks that are the relics of the old bulb; after which expose them again in the same place to dry, and harden effectually; then put them up safe in the dry, in boxes, the large bulbs and the off-sets separately, to remain till the time of planting them again arrives.

Observing, the flowering bulbs are to be planted as has been already advised, and the off-sets in separate beds, by way of a nursery, to remain to acquire due size and strength for full flowering, then managed as the other flowering bulbs. See BULBUS.

Thus far concludes the principal general culture of the great family of Tulips: we shall now next exhibit the general method of propagation.

Method of Propagation.

All the sorts of Tulips are propagated abundantly by off-sets of the root annually; and are also raised from seed to gain new varieties.

By Off-sets.—The old bulbs increase fast by off-set bulbs from their sides, and which should generally be separated annually, especially those of the fine Tulips; and the season for this is in June, when the flower is past,

and the leaves and flower stems begin to wither; then take up the roots wholly, and separate the small increased off-sets from the larger bulbs, planting the off-sets in nursery beds, in drills six inches asunder, and three deep, to remain a year or two to grow to a flowering state; managing the flowering bulbs as already directed.

Thus by off-sets may all the sorts of Tulips be propagated in great abundance, and by off-sets every approved sort continued always the same, so that being in possession of any new or approved varieties, may, with a few bulbs, soon increase the stock by off-sets annually, and will generally produce flowers similar to their respective parent bulb. See BULBUS.

By Seed.—This is a most tedious undertaking, as the Tulip, from the time of sowing the seed, is seven or eight years before it produces flowers; and after all, they at first appear only single-coloured, before explained, often requiring two, three, or more years longer before they break into different colours or variegations, so that the tediousness of raising seedling Tulips to a flowering state often deters many from the undertaking. It is, however, the method by which all the fine varieties of Tulips were first obtained, and new varieties are still annually gained, as many persons sow some every year, in expectation that after the first six or seven years a new show of flowers will be produced, and out of which many new varieties will annually discover themselves in each parcel; and it is by this process the Dutch are famous for furnishing such an infinity of fine varieties, supplying almost all other countries in Europe.

Therefore, for the satisfaction of those who may incline to embark in this tedious undertaking, we will explain the method of sowing and rearing the seedlings to a flowering state.

The seed for this purpose should be saved from some strong-blowing plants, that are always fully exposed to the free air, suffering them to stand till the heads or seed-pods and seed are duly ripened; then gathered in a dry day, and laid upon a shelf, &c. till September, the season for sowing them; which may be performed either in a bed of any good light mould, in the full ground, exposed only to the morning sun; or in boxes or large pots of light earth, and placed in a similar situation: observing, if in beds, to sow the seed in shallow drills, and cover it near an inch deep; and if in boxes or pots, sow it on the surface, and cover it the same depth; they will come up the following spring with fine grass like leaves; at which time be careful to keep the young plants very clean from weeds; likewise

give frequent moderate waterings in dry weather, continuing it occasionally as long as they retain their green leaves in a growing state, and not after; and when the leaves decay, clear the surface carefully from weeds and moss, if any, and directly sift a little fresh mould over the surface half an inch deep, which is all that is required till next year; when the plants will rise with much stronger leaves, in proportion to the increased growth and strength of the bulbs; which, when their leaves again decay in summer, should be taken up and planted in nursery beds, in drills two inches deep, and the same distance in the lines, with the rows four or five inches asunder; here to remain and take their growth for two years, keeping the beds clean from weeds, and sift some fresh earth over the surface every autumn, half an inch deep; then, in the summer, when their leaves decay, the roots being by that time considerably improved in growth, should be again taken up, and planted in a fresh prepared bed, in drills three or four inches asunder, in which to remain two years longer; then at the decay of the leaf, should be again transplanted into fresh beds, in rows as before; where let them remain to blow; afterwards ordered as the other flowering bulbs of Tulips, in the manner already shown.

Observe, however, when they are in full flower, to examine them with attention, in order to mark such of them as discover the best properties, that they may be separated from the others at the proper lifting season, and replanted in beds by themselves for breeders; removing them annually at the proper season into different beds of opposite or contrary soils, as before suggested; such as one year in poor hungry earth, the next in a much richer mould; and so continue till they break into variegations and stripes of different colours.

Thus each year as the flowers break into colours, mark them in order to be taken up, and ranked with the other improved varieties.

TURF.

Grass Turf cut from a pasture, &c. for laying in gardens, to form immediate grass-compartments for lawns, plats, bowling-greens, &c.

When designed to form immediate grass lawns, walks, bowling-greens, and other grass compartments in pleasure-grounds, it is effected by procuring Turf, cut or slayed with a Turling-iron, in some close fine grass sward, in regular lengths of two or three feet, and a foot wide, and being properly laid down close and regular in the places intended, it immediately forms an even grass sward, which quickly

ly strikes root in the ground, in proper growth and verdure; and may be performed any time in autumn, winter, and spring, in open weather, or occasionally in summer, in a moist season.

The best Turf for gardens is that of some fine close fed pasture, common, or downs, &c. where the sward is close and even; or that of any grass field of similar close firm sward, where the grass is not rank and coarse, nor abounding in weeds, or much over-run with the common wild daisy.

In proceeding to cut Turf, being furnished with a proper Turfing-iron, (see TURFING-IRON) and a racer or sward-cutter to race out the requisite width and length of the Turf, by dividing the surface of the sward; (see RACER) and having a line, strain this tight lengthways the grass ground, and with the cutting racer, striking it into the surface of the sward, close to the line, pushing it along before you, cut or score the sward in a straight cut the length of the line, accordingly, about an inch and half deep; and having thus raced out one length, move the line a foot width farther, race out another length as before; proceeding the same to a third, and in as many lengths of the line, in foot widths, as may be required; then by the same means race the sward cross-ways in yard distances, and thus is formed the proper widths and lengths of the Turf; that is, a foot wide and yard long, being the general common size for marking them out, ready for proceeding with the Turfing-iron.

Then the sward being thus raced out, proceed with the Turfing-iron to flay or cut up the Turf; beginning at one side, cut them evenly longways the whole length of each raced line, about an inch or inch and half thick; a person following immediately after, rolls them up one and one in yard lengths, according to the order in which they were raced out, as above, rolling them up regularly, grass side inward, as close and tight as possible; and having cut up one range, proceed with another in the same manner, and so continue with the whole, rolling them up directly as cut, to make room to proceed in the cutting; and according as rolled up, pile them close and regular together, ready for carrying to the destined place.

But when Turf is cut by the hundred, as often done where large quantities are required, they are commonly piled up in tens; four below, three next, then two, and one at top, for the more ready reckoning of the number wanted.

In preparing the ground for laying Turf, it should, where loose, be well trodden or oc-

asionally rammed; then properly levelled with the spade, and afterward raked smooth, and is then ready for laying.

When proceeding in laying the Turf, unroll them regularly on the ground, one and one in its place, making them join close edge to edge, forming at once a close even sward; beating the whole down close and even, with heavy wooden beaters both to settle the roots of the grass close to the earth, and to form the surface equally close and firm, even and smooth; the Turf will thus soon strike root below, and grow above, without any farther care in this part of the business, except occasionally beating down any swelling inequalities, and sometimes rolled with a heavy roller.

Though sometimes Turf laid in summer and early part of autumn, and dry, hot weather succeeding, will shrink and open considerably at the joinings, and assume a decayed-like appearance, when, if convenient, some good waterings would be serviceable; or, however, if this should be omitted, the first heavy rain will recover the whole effectually, swell the sward, close all the chasms, and revive the verdure of the grass; giving at this time a heavy rolling to settle the whole firm and even.

The after culture of grass compartments, formed with Turf as above, is to give occasional mowing in spring and summer, from March, April, or May, according to the growth of the grass, till October, and occasionally poled and rolled. See GRASS.

TURFING-IRON.

An implement for flaying or cutting up grass turf from pastures, for laying in gardens to form grass lawns, plats, and walks, &c.

This instrument is formed with an iron plate for the cutter, six to seven or eight inches wide, a little rounding forward at the edge, which is thin and sharp for cutting, but thickening gradually behind to the upper part, where it is forged to a long bent iron handle, the bending so formed as to admit of the plate or cutter resting flat with its back on the ground, in the proper position for readily cutting or flaying the turf evenly, all a regular depth accordingly, the iron handle at top being either formed with an open handle like the top of a spade, or have a socket in which to fix a short wooden handle like the top handle of a spade aforesaid.

With this instrument, in proceeding to cutting the turf, the workman taking hold one hand in the top handle, the other below, the latter guiding the tool in the proper position, whilst the upper hand is placed against his knee, &c. which assists him in thrusting it

it forward into the ground evenly under the sward; and thus he proceeds along in a regular manner, moving the Turling-iron gradually along at each stroke, level and even, at an equal depth of about an inch and half, and a foot wide, to as many yard lengths as required; thereby separating the surface sward or turf clean from the ground, ready to roll up in separate turfs of a foot wide and yard long, as explained under the immediately preceding article TURF.

According as one range of turf is thus flayed a foot width, or in as many yard lengths as convenient, in one range, a person should roll them up immediately after the cutter, separately turf and turf, grass side inward, and placed out of the way of the workman, ready for him to proceed in another row. See TURF.

TURNERA. (Turnera.)

Comprehends for the stove, an ornamental flowering exotic, of somewhat ligneous growth, native of the hot parts of America, and retained here in stoves for variety; rising with erect stalks, dividing into branches; adorned with oval-spear-shaped leaves, and pentapetalous flowers at the sides of the branches.

Class and order, *Pentandria Trigynia*.

Characters.] CALYX is monophyllous, bell-shaped, tubulous, divided into five segments, and is permanent. COROLLA, five heart shaped, pointed, plane-spreading petals, with narrow claws, inserted into the tube of the calyx. STAMINA, five awl-shaped short filaments, having acuminate erect antheræ. PISTILLUM, a conical germen, three slender styles, and multifid capillary stigmas. PERICARPIUM, an oval, trivalvular, unilocular capsule, containing many oblong obtuse seeds.

1. TURNERA *ulmifolia*.

Elm-leaved Shrubby Turnera.] Rises with ligneous, shrubby-like, branchy stalks, six or eight feet high; garnished with oval-spear-shaped, rough leaves, having two glands at the base; and large yellow flowers sitting close to the foot-stalks of the leaves towards the upper part of the branches.

Variety.] TURNERA *angustifolia*—Narrow Elm-leaved Turnera.

This species and variety are somewhat of a biennial nature, as that after being raised from seed, &c. they are frequently apt to go off the second or third year; though they also often prove of longer duration. Observing, that as they are tender exotics from South America, they must be kept always in pots, and placed constantly in the stove.

They begin flowering in June, continuing

in succession very ornamentally all summer and autumn, succeeded by ripe seeds in September.

Both the varieties are easily raised from seed, sown in the spring in pots, and plunged in the bark-bed, or any other hot-bed, under glasses; and when the plants are come up two or three inches high, plant them separately in small pots, which plunge also in the stove bark-bed, to forward them a little in growth; afterwards may be placed in any part of the stove, and order them as other exotics of similar temperature.

They may also be propagated by cuttings planted in pots, and forwarded as above.

TUSSILAGO. Colt's-Foot.

It consists of low, hardy, herbaceous, creeping-rooted perennials, for variety and medical uses, remarkable for producing their flowers before their leaves, rising with low erect stalks only a few inches high; roundish, heart-shaped, and oval leaves close to the ground, and the stalks terminated by small compound flowers, some radiated, and some without a radius.

Class and order, *Syngenesia Polygamia Superflua*.

Characters.] CALYX, a compound flower, having a cylindrical cup composed of fifteen or twenty linear, spear-shaped, equal squama or scales. COROLLA, a variously compound flower; being either mostly all hermaphrodite florets, or hermaphrodites only in the disk; funnel-shaped, and four or five-parted at the brim; and female florets in the radius, narrow, tongue-shaped, and entire. STAMINA, in the hermaphrodites, five very short hair-like filaments, having cylindric antheræ. PISTILLUM, a short germen, thread-shaped style, longer than the stamina, which in the females is bifid. PERICARPIUM, none; a single seed in each floret, which is oblong, compressed, and crowned with a hairy down.

There are many species of *Tussilago*, the most material of which are the following, consisting of the common *Tussilago*, and five other species.

1. TUSSILAGO *Farfara*.

Common Tussilago, or Colt's-foot.] Hath fibrated, creeping, white, perennial roots; sending up single, thickish, imbricated stalks, five or six inches high, that are uniflorous, or each crowned with only one largish, pale-yellow, radiated flower, appearing in March and April before the leaves; and when the flower is past, the leaves arise, being large, roundish, nearly heart-shaped, angulated, indented, and hoary.

This species, in its natural growth, inhabits moist situations every where in Britain, and most

most parts of Europe in great plenty, creeping and multiplying exceedingly by the roots; and is not much cultivated in gardens.

It, however, is worth culture in the herbaceous collection, both to effect variety among the spring flowers, in patches in the borders, where it will exhibit an agreeable singularity; and may also be cultivated as a medicinal plant, its leaves being often used in decoctions, and as a principal ingredient in the British Herb Tobacco.

It is one of the *filius ante patrem* tribe, i. e. son before the father; because the flowers always arise before the leaves.

2. TUSSILAGO alpina.

Mountain Colt's-Foot.] Hath a creeping perennial root, sending up an almost naked stalk, only three or four inches high, which is uniflorous or crowned with only one purple flower, in March and April, and almost round, or orbicular heart-shaped, crenated leaves, downy underneath.

Variety.] Round hoary-leaved.

3. TUSSILAGO Anandria.

Siberian Colt's-Foot.] Hath a creeping perennial root, sending up erect somewhat scaly stalks, three or four inches high, crowned each with one purplish flower early in the spring; and oval lyre-shaped leaves close to the ground.

4. TUSSILAGO Petasites.

(Petasites) — Tussilago Major, or Common Butter Bur.] Hath a thick, fleshy, creeping perennial root, sending up thick hollow stalks, six inches high, crowned with several purplish flowers, collected in an oval thyrse or spike, having all the florets floscular hermaphrodites, and large roundish heart-shaped leaves, from one to two feet broad; grows wild in moist meadows, &c. in England and other parts of Europe, and is a medicinal plant.

5. TUSSILAGO hybrida.

Hybridan German Tussilago, Greater Colt's Foot, or Long-stalked Butter Bur.] Hath a creeping perennial root; sending up stalks six or eight inches high, crowned with an oblong thyrse or spike of flowers, having many naked, floscular, female florets; and large leaves arising after the flower is past.

6. TUSSILAGO alba.

White Alpine Tussilago, or smaller Butter Bur.] Hath creeping perennial roots; slender stalks, three inches high, crowned with a flat thyrse or spike of white flowers; and largish leaves, arising after the flowers are past.

All these species of *Tussilago* are very hardy perennials, of great duration in root, but annual in stalk and leaves, and mostly all possess the singularity of producing their flowers before the leaves; the flowers rising immediately from the root on low slender foot-stalks, having in some sorts only one flower at top; in others, several collected in a thyrse or close bunch, generally all appearing early in spring; and when the flowers fade, the leaves arise directly from the root, on short foot-stalks near the ground, continuing till autumn, then decay: and the roots remaining, send up flowers and leaves again every spring; producing also abundance of downy seeds early in summer.

These plants may be employed in gardens for variety, and although they naturally affect moist situations, they will succeed almost any where, and will increase abundantly by the root, be of many years duration, and exhibit their flowers annually in spring.

But the *Common Tussilago*, &c. may also be cultivated in beds as medicinal plants.

They are all very easily propagated by parting the roots in autumn or spring, the smallest slip will readily grow, and soon multiply.

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Furze, Gorse, or Whins.

They are shrubby, thorny plants, consisting of two species only; one sort, *Common Furze*,

is a noted, hardy, European shrub of heaths and commons, sometimes cultivated for variety in shrubberies, and occasionally to form field hedges; and the other is a tender exotic shrub.

shrub of Africa, requiring shelter of a greenhouse here in winter; are both of very branchy, bushy growth, five or six feet high, remarkable for their evergreen shoots and branches, armed with strong evergreen spines; small, thinly placed, deciduous leaves, and numerous papilionaceous flowers all along the sides of the young branches.

Class and order, *Diadelphia Decandria*.

Characters.] CALYX, two oval, oblong, concave, permanent leaves. COROLLA is papilionaceous, with five petals, having a large, oval, heart-shaped, emarginated vexillum; two short, oblong, obtuse wings, and a bipetalous carina or keel. STAMINA, ten diadelphous filaments, having simple antheræ. PISTILLUM, an oblong, cylindric germen, a rising style, crowned with a small obtuse stigma. PERICARPIUM, an oblong, turgid, bivalvular, unilocular pod, containing roundish seeds.

There are only two species, both of shrubby growth, as before suggested; one of which is hardy and grows wild in all European countries; the other tender. See each below, under its proper head.

Hardy Kind and Varieties.

Consists of one species, *Common Gorse or Whins*, having several varieties, all shrubby, very thorny plants, natives of England, &c.

1. *ULEX europæus*.

Common European Ulex, commonly called Furze, Gorse, or Whins.] Rises with upright, hard, woody, whitish-brown stalks, branching numerously and bushy, five or six feet high or more, having green shoots and branches, all very closely armed with strong green spines sparsedly; small, acute, hairy leaves; and numerous large yellow flowers along the sides of the young branches.

Varieties are,] Common yellow Furze of our wastes and heaths — White-flowered Furze — Long-spined Furze — Short-spined Furze — Large French Furze — Dwarf Furze — Round-podded Furze.

They all flower in March, April, and May, very profusely, succeeded by turgid pods, containing the seeds; ripening in autumn.

This species and varieties are remarkable for having all their young branches, shoots and spines of a lasting green colour, but are deciduous in leaf, which come out in the spring and soon fall off, though from the nature of their numerous branches and spines remaining always green, they appear like evergreens, and we have ranked them accordingly in that tribe. See EVERGREENS.

It grows wild on wastes, heaths, and commons in England and all other countries in Europe, often overspreading large tracts of

ground, so is not generally cultivated in gardens, except sometimes a few in extensive shrubberies for variety and observation, and for which purpose a few plants of the different sorts merit admittance in large grounds, both as flowering shrubs and evergreens, as they will effect a singular diversity at all seasons.

The Common Furze is likewise sometimes cultivated for outward hedges to fields, generally sowing the seed on the top of dry banks, in a single or double row in drills an inch deep, where the plants are always to stand, suffering them to grow up thick quite from the bottom; and will form a close fencible hedge, and may either be trained regular, by clipping with garden-shears every summer, in moist weather, or permitted to run up in a natural growth, rough and bushy; though as this kind of hedge, when old, is apt to die off in gaps, become straggling, and naked and hollow at the bottom, it is but in small estimation; however, those who incline it may easily raise a hedge, by sowing the seed in autumn or spring in any light soil, in drills as above in the place where the hedge is intended.

Tender Kind.

2. *ULEX capensis*.

Cape, or African Berry-bearing Furze.] Rises with a hard ligneous stem, branching four or five feet high, having flexible green branches, terminated each with a single spine; small, obtuse leaves singly, and numerous flowers along the sides of the branches.

The flowers of both these species of *Ulex*, and respective varieties, are all of the papilionaceous or butterfly-flowered kind, composed each of five petals (see the *Characters*); and in the Common Furze particularly, the flowers rise very numerously all over the plants, appearing very conspicuous; succeeded by great abundance of seed, which is discharged from the pods widely around, and fill the ground with many young plants.

If intended to cultivate the Common European Furze and varieties, it may be introduced sparingly in any of the large shrubbery quarters, as before hinted; either raising them from seed, or procure young plants.

And the second sort must be potted, and placed among the greenhouse plants to have shelter in winter.

They are all propagated by seed.

Sow that of the first sort either in autumn or spring in any light ground, either in patches in the shrubbery, where it is designed the plants are to remain, or in drills in nursery beds, and transplant the plants while they are quite young, for as they have hard, woody, naked

naked roots, they do not succeed well by transplantation when grown large.

But when intended to raise a Furze hedge, always sow the seed at once in the place where you design the hedge to be, in drills an inch deep, suffering the plants to remain in the same place, being careful to keep them clear from weeds the first two or three years, till they are a little advanced in growth.

The second species may also be raised from seed, which must be obtained from Africa, its native soil; sowing it in pots and plunge them in a hot-bed, and when the plants are come up, two or three inches high, prick them in separate small pots, and manage them as other green-house shrubs.

The propagation of this sort is also sometimes effected by layers and cuttings, assisted by plunging the pots of cuttings in a hot-bed or bark-bed.

ULMUS.

Elm Tree.

The Elm is a most valuable deciduous timber-tree, of lofty and magnificent growth, and of great estimation and importance, as a most capital forest-tree, and for various garden plantations, hereafter hinted; arises to a very considerable stature and magnitude, with a large, regular, branchy head, closely adorned with oblong, oval, rough, dark-green leaves, and bunches of small apetalous flowers of no beauty, succeeded by small roundish seeds.

Class and order, *Pentandria Digynia*.

Characters.] CALYX is monophyllous, five-parted at the rim, coloured within, and permanent. COROLLA, no petals. STAMINA, five awl-shaped filaments, twice the length of the calyx, having short, erect, four-furrowed antheræ. PISTILLUM, an orbicular erect germen, two reflexed styles, terminated by downy stigmas. PERICARPIUM, a large, oval, compressed, membranous, drupaceous fruit, including one roundish compressed seed.

There are four species of *Ulmus* that merit observation in this genus, eligible for general and occasional culture; all of the tree kind and deciduous tribe, and all proper for any hardy plantation; though there is only one principal species in general cultivation, which, however, comprehends many excellent varieties, consisting of the various sorts of Elms that exhibit themselves in field hedge-rows, woods, parks, and garden plantations in almost all parts of the kingdom.

1. ULMUS campestris.

Champaign or Common Elm Tree.] Rises with an upright, straight stem, and regular branchy head, sixty or seventy feet high or

more, covered with a rough bark; largish oblong-oval, double-ferrated, rough, dark-green leaves, unequal at the base; and reddish or green flowers in bunches towards the ends of the branches; succeeded by oval fruit, furnishing ripe seeds the end of May or beginning or middle of June.

Varieties.] Common small-leaved English Elm — Larger rough-leaved English Elm — Small-leaved Cornish Elm — Smooth-barked or Wych Elm — Narrow-leaved Wych or Scotch Elm — Broad-leaved Wych Elm — Smooth-leaved Wych Elm — Rough-barked Dutch Elm, with large leaves — Yellow or gold striped-leaved Elm — Silver striped Elm — Silver-dusted Elm. All of which are varieties of the same species, having all doubly-ferrated leaves, unequal at the base.

Their principal variation and difference of growth is as below.

Small-leaved English Elm.] Is of fine, straight, lofty growth, branching very numerous, regular, and erectly in a beautiful picturesque manner, very closely garnished with smallish rough oval leaves, and attains a great magnitude.

It is found growing abundantly in the hedge-rows of fields in the south of England, and the counties round London, &c. and on account of its lofty stature, and close, regular, branchy head, is an approved sort for all garden ornamental plantations, as being the most estimable for beauty and elegance of growth, of all the varieties of Elm; also as a forest or timber-tree next in size and value to the oak for strength and durability.

The large-leaved English Elm is distinguished from the former by its leaves being broader and rougher.

Narrow-leaved Cornish Elm.] Is also of straight handsome growth, almost next in stature to the Common English Elm, branching erect, very close and regular, and very closely garnished with small, oval, lively green leaves.

Is highly valued both for ornamental plantations, and as a forest tree.

Wych or Scotch Elm.] Rises to a great height and magnitude of trunk, with a large, spreading, branchy head, having very large, oblongish, rough leaves.

All the varieties of this *Wych Elm*, consisting of the Narrow, Broad, and Smooth-leaved, are alike in their general growth, having much more spreading branches than the two former sorts; are remarkably swift growers, and will prosper in almost any soil, and soon attain a stately growth, so are proper to plant as forest trees, and for ornament in parks and other capacious places, and in avenues, &c.

Dutch or Rough-barked Elm.] Grows very large, branching irregularly, and widely around, covered with a rough fungous bark; produces large, vigorous shoots distantly placed; and large, oval, acute-pointed, very rough leaves. Was first introduced from Holland many years since, and was formerly in much esteem for forming ornamental hedges in gardens, and other trained devices; but by its strong, irregular, open growth, is improper for such purposes, and is much better calculated for planting in parks, fields, avenues, &c. and suffered to grow rural; also to plant as a timber-tree.

2. *ULMUS americana.*

American Elm-tree.] Rises with an upright stem and branchy head many feet high, garnished with oblong-ovate, rough, equally sawed leaves, unequal at the base.

Varieties.] Red-twigg'd American Elm—White twigg'd—Pendulous branched.

3. *ULMUS nemoralis.*

Wood, or Hornbeam-leaved Elm.] With oblong smooth leaves, equally serrated; and sessile flower.

4. *ULMUS pumila.*

Dwarf Siberian Elm.] With small oval, equally serrated leaves.

Of the above four species of *Ulmus*, the first sort and its several varieties are the more noted and generally known in our principal plantations; and of which the first two and their varieties are superiorly estimable; but all the others are also eligible.

All the four species of Elm, and their respective varieties, are deciduous, and of hardy growth; will grow in any common soil and situation; and are proper to assemble in any general tree plantations, or in groups, and ranges, &c. separately, wholly of the Elm kind, both decoratively; and the larger kinds also as first-rate forest or timber trees, either in assemblage with other forest-tree kinds, or some in ulmarium plantations.

The different varieties of the Common Elm arrive to very large timber-trees, as may be observed by old trees growing in parks, hedge-rows, and avenues, and the timber is exceedingly valuable for many strong purposes, such as most kinds of wheel-wrights' work, water-pipes for conducting water under ground, for water-pumps, and various other uses in different trades, where strength and durability is required; and, therefore, as they are also of a free, expeditious growth, and will thrive in any common soil and exposure, they demand universal culture as forest-trees, both in assemblage with other trees of the forest kind, and to form woods, thickets, and ranges by themselves, and to plant in hedge-row & along the

borders of fields, and in clumps in the corners thereof; observing the English Elm, Cornish, and Wych Elms, are the most eligible sorts for general culture as timber trees; though it is advisable to plant some of all the varieties to effect the greater diversity in the plantations; and they are also all eligible to arrange in any large ornamental plantations, in extensive pleasure-grounds, parks, and out-grounds of estates, as hereafter noticed: and for these different occasions, all the sorts may be plentifully raised, some from seeds, and all of them also, both by layers, suckers, and by grafting, as directed in their propagation, or may be purchased at all the public nursery-grounds.

Remarking, they should generally be planted out finally while they are young, i. e. from four or five to six, eight, or ten feet high, as at that size they will generally take root, establish themselves, and grow more freely and expeditiously than older trees. See PLANTATION.

Though it is observable of the Elm, in particular, that they will bear removal when large, better than almost any other tree, on account of the root being furnished with numerous smaller roots and fibres, spreading horizontally near the surface, so as trees of fifteen or twenty feet high, may, on particular occasions, be safely removed, as they will often readily rise with a large spread of roots, and frequently with balls of earth thereto; and being planted in a capacious pit, will readily strike, and grow freely.

However, this removal, or transplantation of large Elms, is not an eligible practice for those intended for any general plantation, but only occasionally in garden plantations in places where an immediate shade or shelter is wanted, or to form a blind where necessary, or to hide any disagreeable object; for all of which purposes large Elms may be more readily removed with success than any other trees of the deciduous tribe.

But Elms, considered for purposes in garden plantations, are employed occasionally for ornament, and for shade and shelter; both as rural objects, and for training uniformly. Considered, however, as rural trees, they are excellently adapted for forming avenues, either alone, or in concert with other deciduous trees of lofty stature, and to assist in forming boundary plantations of capacious lawns in parks, &c. likewise to form shade, by being disposed either in thickets or clumps, or ranged along near the verge of shady walks, &c. and are likewise excellent to plant for shelter, where necessary, being planted in groves, thickets, clumps, or single ranges, at a little distance, they will break the violence of

of tempestuous winds and violent blasts, both from the main habitation, and from particular districts of the garden; and have a fine ornamental effect, disposed in extensive open places, some in straight ranges, others in clumps, and some as single detached standards; in all of which modes of planting them, they should generally be suffered to assume their own natural growth, except trimming off strong lateral shoots and low straggling branches from the stem, and reducing very irregular straggling branches of the head.

For training uniformly, no deciduous tree is better adapted; they form beautiful lofty hedges, very close from bottom to top, from ten to forty or fifty feet high, the English and Cornish elms particularly, and which two varieties were formerly in great repute in forming lofty, towering hedge-work in gardens, both internally, and on the outer boundary, along road sides, serving both for ornament and shelter. And Elm hedge-work was also often trained into arches, porticoes, pilasters, galleries, &c. so as to produce a very noble effect in the ancient style of ornamental gardening: and for all which purposes of uniform training, the small-leaved English and Cornish Elms, above noticed, are considerably the best calculated, on account of their thick and regularly-branching growth, and close placed foliage. See HEDGES.

All the sorts of Elm will grow well enough in any common soil, but succeed best in a rich, deep earth, or that of a loamy nature; though we may often see large and prosperous Elms on all sorts of land, both rich and poor, moist and dry; generally, however, allowing the English Elms the best situations; and the Wych and Dutch Elms may be planted occasionally on the coarsest soils.

The season for removing or transplanting Elms, may be almost any time in open weather, from the first fall of the leaf in October or November, till March. See PLANTING.

Method of Propagation, &c.

The propagation of Elms is effected different ways; as by seed, suckers, layers, and occasionally by grafting.

By Seed.—The raising of Elms from seed is more particularly practised for the Wych Elm, which ripens seeds abundantly every summer, in May or June; the others do not always perfect seed sufficiently; but where attainable, it may also be raised successfully in their propagation: therefore, when the Wych Elm-seed, and any of the other sorts, is perfectly ripe, let a due quantity be procured for sowing. Then may proceed to sow some of it almost directly, in four-feet-wide beds,

half an inch deep (see SOWING SEED); and the rest may be kept till spring, to insure the greater chance of success; previously drying it well, out of the sun, then put it up close, till towards autumn, when it will be proper to mix it with sand, to preserve it more effectually through the winter, till the middle of February; then sow it in beds as above; remarking of that which was sown in summer, or as soon as gathered, it will be of advantage to hoop the beds over with rods, in order to be covered with mats occasionally, to afford shade from the hot mid day sun, giving also occasionally waterings in dry weather; and thus in a month many of the plants will come up, being careful to keep them well weeded, as they may require, and a repetition of moderate waterings, continued in dry weather: though the whole will not probably come up before the following spring; but those of the spring sowing generally all come up regularly together the same season, in April, and often assume a freer growth than those which came up in autumn; however, in both cases, suffer the seedling plants to have one or two years growth in the seed-bed; then plant them out in nursery lines, the rows two or three feet asunder, and the plants fifteen or eighteen inches distant in each row; here give them the common nursery care, and train them for the purposes intended. If for standards, either for timber, or ornamental plantations, train each to a single stem, and as they advance in height, clear the stem from all lateral shoots, leaving only the very small twigs, just to draw and detain the sap, for the better augmentation of the stem; suffering the leading top-shoot to remain entire, as also the principal branches of the head.—And those designed for hedge-work, &c. let them branch out all the way, and become feathered or branchy to the bottom, or as low as may be required for the trained purposes intended, only trimming them occasionally, either with the knife or garden shears, as you shall see proper, to give them the intended form.

And thus all the sorts being trained in the nursery for the purposes intended, till they have four or five years growth, of four or five to six, eight, or ten feet high, as before intimated, they will be fit for transplantation where they are to remain.

By Suckers.—Most of the sorts of Elms send up many suckers from the roots, but most plentifully in the English and Dutch sorts; and which, if taken up carefully with root fibres, they will form good plants; therefore in autumn, winter, or spring, having recourse to any large trees that send up plenty of suckers,

let these be dug up, with as many root fibres as possible; and of which chusing only such that are well rooted, trim them for planting, by cutting them down at top to six or eight inches; place them in small trenches or drills, five or six inches deep, one row in each, half a foot apart, and the drills about half a yard asunder; giving waterings in spring and summer; and here let them remain two years, to form good roots, then transplanted in wide nursery rows, and managed as directed for the seedlings.

By Layers.—All the sorts of Elms may be easily raised by layers, previously preparing a quantity of stools, to produce shoots, situated near the ground, for laying (see **STOOLS**). And the proper season for laying them is autumn, winter, or early in spring; performing it by slit-laying (see **LAYERS**); and as soon as all are layed, and moulded in, top every layer with a knife down to one eye above ground, and the work is finished.

Thus, those layers will readily take root in spring and summer following, and shoot at top probably two or three feet long by the next autumn, when they should be detached from the stools, and planted in nursery rows, two feet or a yard asunder, and half a yard distant in the rows; and when they begin to shoot, train them with one leading shoot only, as observed for the seedling Elms, managing them in the same manner.

By Grafting.—All the varieties of elms may be propagated, and continued distinct, by grafting upon stocks of the Wych Elm, raised from seed, suckers, or layers, though the seedling stocks are preferable; and this method of propagation upon the Wych Elm stocks particularly, as being the fastest and largest growers, will be found a good improvement of the other more moderate growers; such as the English Elm in particular, which being grafted on the Wych Elm, generally attains a larger growth, and sooner grows to maturity. So that having raised a quantity of seedling Wych Elms, as before directed, some rows of them may be allotted for stocks, which, after having two years growth in the nursery lines, they will be fit to graft; and the beginning of February, is the proper season: at which time having procured a quantity of cuttings of young moderate shoots of the best English Elm, or any other variety you intend to propagate, and cut into four or five-inch lengths, proceed to insert them in the stocks by the method of whip-grafting. (See **GRAFTING**.) Observing, however, as it is most advisable, to graft them as low as possible, the earth should be removed away a little down to each root, then cutting

off the head of the stock, within two or three inches of the bottom, insert the grafts, one in each stock, as above, binding them close, and clay them well; then draw the earth up about and over the clay, the more effectually to secure it from falling off by the effects of frost, &c.

Being thus grafted, the grafts will unite timeously the same spring, and shoot forth strongly in summer, half a yard, or two or three feet in length; observing to encourage only one leading shoot; so that if they fork at top into two or more shoots, take off the weakest, and leave the best shoot for the leader; displacing also all large side-shoots from the stem; and let the top or leading shoot remain always entire, as also the general upper branches of the head grow in height as fast as they can, agreeable to the nature of their growth, especially all those intended for standards.

UMBELLA. An Umbel of flowers.

It is a mode of cluster-flowering; many flowers being produced close together on so many slender foot-stalks, proceeding all from one point, or common centre, and rise all to an equal height; so as the flowers they support forms generally an even round surface at top, such as in the flowers of *angelica*, carrot, parsnep, &c.

The umbellate mode of flowering differs from the *corymbus*, in which the foot-stalks also elevate the flowers to an equal height at top, resembling an Umbel. The foot-stalks of the umbellate flowers issue all from one centre or point of the common receptacle, attaining all nearly an equal length and height; whereas those of the *corymbus* rise from different points, lower and higher, and each lower foot-stalk attains a greater length than that immediately above it; so as they altogether, with the flowers at top, form also an even surface, like the umbellate flowers. See **CORYMBUS**.

In the umbellate flowers, when none of the foot-stalks of the Umbel are subdivided, it is termed a simple Umbel; when on the other hand each flower-stalk is subdivided at its extremity into a number of smaller foot-stalks, that immediately support the flowers, so as each such foot-stalk bears at top a little Umbel, is commonly called a partial Umbel, and that the main or general Umbel, or aggregate, being made up of several such smaller ones, it is termed a compound Umbel.

Umbellate flowers are generally produced at the top of the stalks, and extremity of the branches of the plants of the umbelliferous tribe.

The flowers that compose an Umbel are generally

generally numerous, and separately small, consisting each commonly of five petals, five stamina, and two styles, and each flower is succeeded by two naked seeds.

UMBELLIFEROUS plants are such as produce their flowers in an Umbel, and consist both of herbaceous vegetables and trees, but mostly of herbaceous plants.

The principal of which are, angelica, carrot, parsnep, parsley, celery, fennel, dill, chervil, fennel-giant, lovage, Alexanders, coriander, carraway, black master-wort, Macedonian parsley, samphire, eryngo, hare's ear, &c. all of which being of the Umbelliferous tribe, mostly rise with erect, hollow stalks, generally branching in the alternate way; the leaves also are placed alternate; which in some are simple, in others fingered, and some pinnated or winged; and all the stalks and branches generally terminate in an Umbel of flowers, either simple or compound, in the different plants. See each in its proper genus.

Of this tribe of plants, several of them are valuable esculents of the kitchen-garden, and some are wholesome medicinal plants. See KITCHEN-GARDEN and MEDICINAL PLANTS.

UMBILICATUM. Navel-shaped leaf, or fruit, &c.

An Umbilicated leaf, of the peltate or target-form kind, shaped like a navel at the insertion of the petiole or foot-stalk, which is commonly inserted into the middle or disk, on the under, and sometimes above.

This term is also applicable to some sorts of flowers and fruit: such in the latter as the apple, &c. which have one or both ends hollowed like a navel.

URENA. Indian Mallow.

In this genus are comprised, for the Stove, three species of ligneous malvaceous perennials of India and America, two of which being of upright growth, two or three feet high, the other a procumbent plant, adorned with angular-lobated, palmated, and halbert-cordate leaves, and mallow-shaped, reddish flowers, sitting close to the axillas of the stalks singly; having double calyxes, the outer quinque-dent, and the inner deeply five-parted; five oblong, obtuse petals, many monadelphous columnar stamina; a roundish-pentangular germen, with a single style; succeeded in the germen by a pentagonal, quinquelocular capsule, having five angular seeds.

Class and order, *Monadelphia Polyandria*.

The species are,

1. URENA lobata.

Lobated China Urena.] Rises with upright stalks, and angular-lobated leaves.

2. URENA sinuata.

Sinuuated Indian Urena.] Rises with upright stalks, garnished with sinuated-palmated leaves; the sinuses obtuse.

3. URENA procumbens.

Procumbent China Urena.] Grows with procumbent stalks, garnished with halbert-heart-shaped, undivided, serrated leaves.

These plants, natives originally of distant warm countries, are retained here in curious stove collections, for variety and as flowering plants, producing flowers, in successional order, two or three months in summer and autumn, often succeeded by ripe seeds, by which the plants may be raised in the spring, &c. by the assistance of a hot-bed, and by off-sets and slips.

URTICA. Nettle.

This genus consists of hardy, herbaceous plants, some of which are well known as common and troublesome weeds in gardens; and three or four species of foreign growth are retained in some gardens, to effect variety; rises with upright stalks, adorned with oblong and oval leaves, and monœcious flowers, without petals, growing in catkins at the sides and top of the stalks.

Class and order, *Monœcia Tetrandria*.

Characters.] CALYX, male and female; flowers separated on the same plant, having in the males a four roundish-leaved cup; and in the females an oval cup, composed of two valves, and is permanent. COROLLA, no petals, but in the males is a pitcher-shaped nectarium in the centre of the flower. STAMINA, four awl-shaped spreading filaments, having bilocular antheræ. PISTILLUM, an oval germen, no style, and a hairy stigma. PERICARPIUM, none; a single, oval, compressed seed lodges in the permanent female calyx.

There are many species of *Urtica*, but of which only three or four are common in the gardens, retained as plants of variety; the others being plants of but little use or estimation, and some of them are common weeds; such as the common Stinging-Nettle, which grows too fast every where, and never cultivated: the common Nettle, however, has great virtues as a medical plant, and is also in estimation as an excellent pot-herb among poor country people, in the spring, while it is young; and is of a very wholesome, cleansing property.

The most material sorts in our gardens are the following four species, all of foreign growth; but the first three sorts are hardy enough to succeed here in the full ground, and the fourth requires shelter in winter.

1. URTICA cannabina.

Hemp.

Hemp Urtica, commonly called *Tartarian Nettle*.] Hath a perennial fibrous root, sending up many square stalks, five or six feet high; having oblong, three-parted, deeply-cut leaves, placed opposite; and flowers produced in long catkins at the axillas, towards the upper part of the stalks.

It grows naturally in Tartary and Siberia.

2. *URTICA canadensis*.

Canadian Nettle.] Hath a fibrous, perennial root, sending up erect stalks, two feet high, adorned with heart-shaped-oval leaves, placed alternately, and flowers produced in branching amentums, growing erect.

3. *URTICA cylindrica*.

Cylindrical-flowered American Nettle.] Hath a fibrated, perennial root; upright stalks, three feet high; oblong, spear-shaped, opposite leaves; and flowers produced in cylindric, undivided, solitary amentums.

4. *URTICA nivea*.

Snowy, or White-leaved Chinese Nettle.] Rises with upright stalks, three or four feet

high, garnished with sub-orbicular, alternate leaves, acute-pointed at both ends, and hoary and very white underneath.

All these plants are perennial in root, sending up new stalks annually in spring, flowering in July and August, and the seeds ripen in Autumn.

The first three sorts are hardy plants, and succeed in any common soil.

They are retained in our gardens, to diversify the herbaceous collection, and effect variety in the pleasure-ground; and may be planted in any of the open borders, and other compartments, and in which they will endure many years, and flower annually; though their flowering is more singular than beautiful.

Propagate them by parting the roots in autumn, winter, or early in spring.

But the fourth sort being more tender, must have a warm, dry situation, and some always kept in pots to move under shelter of a garden frame or green-house in winter; and is propagated by slipping the roots in spring.

V.

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VACCINIUM. Whortle-berry, Bil-berry, or Cran-berry.

This genus comprehends many species of hardy dwarf, under-shrubby, and ligneous plants, deciduous and evergreen kinds, all of humble growth; some erect, others procumbent, or trailing; producing eatable fruit of the berry kind, and are introduced in shrubberies, &c. for variety; grow mostly with slender stalks, six inches to two or three feet high, garnished with small ovate and oblong leaves, and monopetalous, campanulate flowers, singly and in clusters, at the sides and termination of the branches, succeeded by globular berries, in much estimation for tarts.

Class and order, *Ostendria Monogynia*.

Characters.] **CALYX**, a very small perianthium, situated on the germen. **COROLLA**, monopetalous, campanulate, divided into four revolute segments. **STAMINA**, eight simple filaments, with two-horned antheræ, having spreading aristæ outwardly. **PISTILLUM**, a germen situated under the cup; single style,

longer than the stamina, and an obtuse stigma. **PERICARPIUM**, a globular, umbilicated, quadrilocular berry, containing many small seeds.

The principal species are,

1. *VACCINIUM Myrtillis*.

(*Myrtillis*)—*Black Whortle-berry, or Bil-berry*.] Rises with slender, shrubby stalks, branching about two feet high; small ovate-oblong, serrated, deciduous leaves; and peduncles one flowered greenish-white, succeeded by large, blackish-red, eatable berries.

Grows wild on wastes and heaths in England, &c.

2. *VACCINIUM album*.

White Pennsylvanian Whorts, or Bil-berry.] Rises with a slender ligneous stalk and branches, about half a yard high; ovate entire leaves, downy underneath; and single peduncles, having two, three, or several flowers in a cluster, at the sides and ends of the branches; succeeded by small berries, ripening of a whitish colour.

3. *VACCINIUM*

3. *VACCINIUM Vitis idæa*.

(*Vitis idæa*)—or *Red Whortle-berry*.] Rises with very slender stalks and branches, six or eight inches high; small ovate, revolute, entire leaves, of a firm consistence, dotted underneath, and evergreen; and terminal, nodding clusters of reddish flowers, succeeded by red, juicy berries of peculiar estimation for tarts.

4. *VACCINIUM Oxycoccus*.

(*Oxycoccus*)—*Cran-berry*, *Moss-berry*, or *Moor-berry*.] Rises with slender, procumbent, creeping stalks; small oval entire leaves, revolute at the edges, and evergreen; and red flowers on long slender peduncles, at the termination of the branches, succeeded by eatable berries, well known for tarts.—A resident of boggy situations in England, &c.

5. *VACCINIUM uliginosum*.

Marsh Whortle-berry, or *Great Bil-berry bush*.] Rises with a woody, shrubby stalk, branching two or three feet high; ob-ovate, entire, obtuse, smooth leaves, whitish underneath, and ciliated at the base; and peduncles, sustaining each one whitish-purple flower, succeeded by large berries.

6. *VACCINIUM hispidulum*.

Hispid-stalked American Whortle-berry.] Grows with filiform, slender trailing, hispid-rough stalks; oval, revolute, entire leaves; and terminal, slender peduncles, sustaining the flowers, succeeded by large red berries.

7. *VACCINIUM mucronatum*.

Sharp-pointed leaved Whortle-berry.] The leaves ovate, dagger-pointed, smooth, entire; and simple peduncles, each sustaining one flower.

8. *VACCINIUM frondosum*.

Frondose Whortle-berry.] The leaves oblong entire, and frondose-leafy spikes.

9. *VACCINIUM corymbosum*.

Corymbous-flowering American Whortle-berry.] Ligneous stalks; oblong, pointed, entire leaves; and oval corymbouses of flowers.

10. *VACCINIUM ligustrinum*.

Privet-leaved Pennsylvanian Whortle-berry.] Shrubby stem and branches; leaves oblong, fine-notched; and naked racemes of flowers.

11. *VACCINIUM stamineum*.

Stamineous American Whortle-berry.] Leaves oblong, entire; and solitary peduncles one flowered, with stamina and antheræ longer than the corolla.

All these species of *Vaccinium* are hardy plants, mostly of low, slender growth, six inches to one, two, or three feet at most; the stems and branches ligneous, under-shrubby, and perennial; natives of wild moors, mosses, heaths, hills, and boggy and marshy situations,

in England, Scotland, and other northern parts of Europe and North America; flowering in April, May, and June, and produce abundance of ripe berries in autumn, of an agreeable acid relish, chiefly valued for tarts in the autumn and winter seasons.

They are admitted in gardens occasionally, a few plants of each, principally for variety, as they are not always very prosperous out of their native soils; and therefore, when intended to cultivate them, should generally be allotted some similar soil and situation as near as possible, in small shrubby compartments, borders, &c.

The first six species are the most commonly known, and of which the first four being natural residents of cold, light, sandy heaths, moors, and woods, &c. and the fifth and sixth natives of boggy, marshy places, they may be planted in somewhat similar situations, in which they will generally thrive and increase the most prosperously; and where convenient to procure some plants in the places where they abound spontaneously in their natural growth, it would be advisable to take that opportunity, removing them with some mould about the roots, and planted accordingly as above; or, however, the above-mentioned sorts, and all the others, may be planted in such situations as the garden affords, as nearly applicable as possible to that of their natural residences.

The season for transplanting them is either in the spring, or early in the autumn, about the middle or latter end of September, or in October, or soon in November.

They are propagated by off-set root suckers, creeping roots, and some by trailing rooting-stalks; and some growing with several rooted stalks and branches may be divided, root and top together, into separate plants; also by seed sown in autumn when ripe, or as soon as obtained, in a shady border, or in the places where the plants are to remain.

VALVULA. A Valve, or opening of a seed-vessel.

A Valve is the external division or opening of a dry seed-vessel, such as a capsule or pod, which, when ripe, splits into two or more openings, to disseminate the seeds, and each opening or division is called a Valve.

The Valves, or openings, as to number, are from one or two to five or many, in the plants of different genera; so that when a capsule, &c. is composed of one Valve, it is termed *univalve*; of two, *bivalve*; when of three, *trivalve*; four *quadrivalve*; and of five, *quinquivalve*, &c. See **CAPSULA**.

VALERIANA. Valerian.

The plants are hardy, herbaceous perennials

nials and annuals; some for variety in the pleasure-garden, and others for medical and esculent uses; all of the fibrous-rooted kind, sending up annual stalks, two or three feet in the perennials, the other but a few inches; ornamented with simple and pinnated leaves in the different species; and terminated by spikes, or umbellate clusters of monopetalous, five-parted flowers.

Class and order, *Triandria Monogynia*.

Characters.] CALYX, a kind of small border placed on the germen. COROLLA is monopetalous and tubulous, with the tube gibbous, and divided above into five obtuse segments. STAMINA, three awl-shaped, erect filaments, having roundish antheræ. PISTILLUM, a germen under the corolla, filiform style, and thick stigma. PERICARPIMUM, a coronated or crowned deciduous capsule, falling off before it opens, containing a single oblong seed.

There are many species; and the most material of which commonly cultivated are the following five; the first four being flowery and medical perennial plants, and the last is an esculent annual, used as a salad herb, commonly called Corn-Sallad, or Lamb's Lettuce.

1. VALERIANA *rubra*.

Red Garden Valerian.] Hath a thick, ligneous, spreading, perennial root; upright, round, smooth stalks, branching two or three feet high, adorned with spear-shaped, entire leaves; and the stalk and all the branches terminated by clusters of red flowers, having tails.

Varieties.] Deep red-flowered—Pale red-flowered—White-flowered—Narrow-leaved with bright-red flowers.

They all flower in May or June; continuing in succession most part of summer, appearing tolerably ornamental; and ripen abundance of seed in autumn, which is often scattered by winds all around, and in crevices of old buildings, &c. and from which many young plants naturally rise, and attain maturity.

2. VALERIANA *Phu*.

Alsatian White Garden Valerian.] Hath thick, fleshy, jointed, fibrous, creeping perennial roots, crowned with numerous leaves, mostly entire, and some divided; amidst them upright, round stalks, branching two or three feet high, garnished with pinnated leaves, and with all the stalks and branches terminated by umbel-like clusters of white flowers, having only three stamina; appearing in May and June.

3. VALERIANA *officinalis*.

Officinal Valerian.] Hath long, fleshy, fi-

brous roots, collected into heads, crowned with many winged leaves; upright stalks, two feet high, garnished also with pinnated leaves, and all the stalks and branches terminated by umbel-like clusters of flowers, tinged with purple, having only three stamina; flowering in May or June.

4. VALERIANA *pyrenaica*.

Pyrenean Mountain Valerian.] Hath fibrous perennial roots, crowned with large heart-shaped, serrated leaves, on long foot-stalks; amidst them upright, channeled stalks, a yard high, garnished with smaller heart-shaped leaves, sometimes by three together, near the top, and the main stalk and branches crowned with umbel-like bunches of pale-red flowers, having three stamina; flowering in June.

5. VALERIANA *Locusta* (annual).

(*Locusta*)—*Lamb's Lettuce*, commonly called *Corn-Sallad*.] Hath fibrous, annual roots, crowned with small, oblong, narrow leaves, broadest and rounded at the top; and when it shoots for seed, rises with a forking, slender stalk, only a few inches high, garnished with small leaves, and terminated by clusters of small white flowers, having only three stamina.

This grows naturally in corn-fields in England, &c. hence is commonly called Corn-Sallad, as being used as a salad herb; and as such it is also cultivated in gardens for winter and spring use.

Varieties.] There are many varieties of this, differing in the form and size of the leaves; some being very narrow, others broader and obtuse, or oblong and spear-shaped; some being entire, and some are serrated or indented, &c. but possess all the same virtues, and may be indifferently used as salad herbs, to use while young, before they grow large and rank tasted; and they prove substitutes in winter and spring sallads, when the garden-lettuce is scarce.

All these five species of *Valeriana* are very hardy plants, and prosper in any common soil of a garden, in all seasons of the year.

The first four are perennials, durable in root, and annual in stalk, which rise from the root every spring, flower in May or June, ripen seed abundantly in August, then decay down to the ground.

All these four perennial sorts may be employed in the pleasure-ground for ornament and variety; and the second and third sort also as medical plants, and as such are highly valued: may be all had at the public nurseries in the proper planting season, autumn, winter, or spring; and may all be planted in any of the open compartments, in assemblage with other large herbaceous perennials, where they will

will endure for years by the root, and flower annually in their proper season, and multiply abundantly by the root; and may also be raised from seed. See their *Propagation*.

However, the second and third sorts, *Valeriana Phu* and *Valeriana officinalis*, being also very valuable medical plants, if intended to cultivate them as such, they should be disposed in beds among other medicinal herbs.

But as to the fifth sort, *Valeriana Locusta*, an annual, it is calculated only as an esculent herb in fallads, principally in winter and early spring; being sown in autumn towards the latter end of August, and in September, in any open situation, and raked in, they will come up in the same year, thinning the plants to three or four inches, and they will be fit for use in winter and spring following: some may also be sown early in the spring, to continue a longer succession.

VARIETAS.

A Variety.

Varieties are the off-spring of certain species, varying in some accidental habit of growth from the natural species or parent plant; yet their variation being generally confined to some particular parts, they still retain the specific mark of distinction of the parent, to distinguish them from plants of a different species.

So that a species often comprise from one or two, to some hundreds of Varieties, varying in some particular, either in their habit of growth, foliage, flowers, fruit, æconomical qualities, &c. and both trees and herbs, annuals, biennials, and perennials, are subject to variation.

For example, species are subject to numerous accidental modes of variation, effected either by the difference of culture, climate, soil, age, &c. and consist often in the difference of magnitude; luxuriant, and dwarf growths; erect, and trailing plants; smooth and prickly Varieties; broad and narrow-leaved kinds; entire-leaved, divided-leaved, and curled-leaved; spotted, and variegated-leaved; smooth-leaved, hairy-leaved, and down-leaved plants; single-flowered, double-flowered, and poliferous flowered; white, red, blue, yellow, and variegated-flowered; sweet-scented, rank-scented, &c. Likewise the fruit in some species are liable to great variations; as round fruit, oval fruit, oblong fruit; also smooth fruit, furrowed fruit, warted fruit, hairy and downy fruit; likewise fruit varying greatly in size, in the same species; likewise in colour, taste, and quality: in some species also, the root is found to vary, as in the carrot, radish, turnep, and potatoe, which often assume different

forms and colours; and some species furnish both male and female Varieties in different plants, as in the dioecious class, comprising the hop, spinach, hemp, &c.; thus the above, and numerous other circumstances occur in the various forms of sporting nature, in exhibiting so many different Varieties in certain species.

But notwithstanding all the above different modes of variation in the particular parts of the varying plants of a species, if those of each species still all retain the same specific botanic mark of distinction, as that which distinguishes the respective natural species from all others, it proves them all Varieties or off-spring of the same parent species.

For as every different species in a genus is distinguished by some particular uniformly constant mark in some part of its growth, all plants in the same genus bearing exactly the same specific mark of distinction unchangeably, are, notwithstanding their accidental variation in other parts of their growth, all Varieties of one species.

Therefore, all the plants that are produced from the seed of the same species, although they may assume different forms and appearances, are to be regarded as the genuine Varieties.

The difference betwixt a species and a Variety is, that a true species raised from seed, will, notwithstanding it may sport into different variations, it still retains its true and constant specific mark through all its Varieties; and suppose there are Varieties of that species with broad leaves, and narrow leaves, white flowers, red flowers, and blue flowers, &c. and that if you sow the seed of any one, it will probably produce seedling plants of all these sorts, each having the parent specific mark of distinction.

It is principally from seedling plants that the different Varieties of particular species first obtain, exemplified in the *auricula* and *polyanthus*, &c. each being a distinct species of the same genus; and each consists of innumerable Varieties, in the colours and variegations of the flowers, all first obtained from seed; which from that of the same plant, often sport into many different colours and variegations in the flower; each variation forming a genuine variety; and probably not one of them with a flower exactly like that of the original parent plant: yet each Variety retains the specific difference of its respective species, the *auricula* never changing to the *polyanthus*, nor that to the *auricula*, but the Varieties of each keep their proper distinction; for the *auricula*, in all its Varieties, continues its *smooth, fleshy, serrated*

leaves; and the polyanthus, its *rough dentated leaves*. The same is also observable of the carnation, ranunculus, anemone, tulip, and numerous other plants, which sport wonderfully in Varieties.

Likewise numerous sorts of trees, of the fruit kind particularly, are remarkably sportive in Varieties; both in their modes of growth, foliage, and fruit: for example, the botanists admit of only one species of apple-tree, which however furnishes an almost endless Variety of its fruit, in regard to shape, size, colour, taste, and quality; as also in the growth of the trees, differing both in magnitude and size, as well as in the size and colour of the foliage; and its specific distinction is, *ferrated leaves, and close-fitting flowers growing in an umbel*, which distinction runs through all the numerous Varieties, however different the trees may be in magnitude of growth, leaves, and fruit: the same is also observable of the pear, plum, common-cherry, peach, &c. there being only one principal species of each of these, but the Varieties of the fruit are very numerous; all of which different variations of the above sorts of trees were first obtained from seedlings; i. e. trees raised from the kernels or stones of the fruit; and almost all the fruit-tree kind sport exceedingly in their seedling plants; insomuch, that out of hundreds of trees raised from the seeds of the best fruits, very few, if any, will produce fruit exactly like the parent, or that possess any good perfection; so that on account of the uncertainty for continuing the approved sorts of fruits from seedling plants, recourse is always had to grafting and budding, and some by layers and cuttings, to propagate the sorts intended, or to continue and increase any new acquired good Variety.

The greater number of Varieties, both of herbaceous plants and most kind of fruit-trees, and some others, are of a variable or sporting nature; so as when raised from seed there is no dependence on having the seedlings come the same sort again, but vary into different sorts of one another; in which case, the propagation of those that are perennial, to continue them with certainty, is effected either by suckers, off-sets, or slips of the root; some by layers and cuttings; or, in the woody kinds, by layers, cuttings, grafting, and budding: but as to annuals, there is no other resource for propagating them than by seed, except in some few sorts by cuttings, such as the *Chrysanthemum* and *Nasturtium*, &c. but in many sorts where particular attention is observed in saving the seeds, always only from the most perfect kinds, they will continue tolerably permanent,

and often come the same again, or but with very little variation.

Many of the kitchen-garden plants and annual flowers consist of many Varieties in the same species; yet by good care in always saving seed from the most perfect plants that discover no signs of a degeneracy, they remain permanent from seed year after year.

However, most of the perennial tribe, both herbaceous and woody kinds, as they being generally more variable from seed, they afford abundant opportunities to continue the permanency of any particular Variety, by off-sets from the root, suckers, layers, cuttings, grafting, and budding, as before noticed.

Sometimes, however, plants, though not raised immediately from seed, will from some accidental cause vary considerably from their usual natural growth, and assume a very different appearance; originating either through culture, climate, exposure, soil, age, diseases, luxuriancy or poverty of nourishment, contusions, or other circumstances; and hereby produce accidental Varieties in some particular parts of growth.

As to the determining the reality of the Varieties, it is in many sorts most easily accomplished by comparing the variable plant with the specific description of the natural species, and the variations of growth of the variety with the same parts in the natural plant; though there are many varieties that require both the knowledge and experience of the most expert botanist to distinguish them with certainty.

From not observing the true specific distinction, Varieties have been ranged as distinct species, and thereby exceedingly increased the number of species erroneously, and caused great confusion in the botanic arrangement; for on account of the slightest difference new species were introduced, which modern improvers of botany discovered to be only Varieties of certain species, and have corrected the errors accordingly.

Therefore, in botanic arrangements, the botanists are careful not to substitute a Variety in the room of a species, which being sometimes a difficult point, requires the greatest care; and the cause of our running into so many errors in this particular, is owing to nature's working and appearing in so many different forms, either through the nature of different countries, climates, soils, exposures, and culture, &c. as before observed.

We have, however, in the course of the arrangement of the numerous articles in this book, been careful to collect the different principal Varieties under their respective species, exhibit-

exhibiting at once each species and its Varieties, when any, arranged distinctly together under their proper genera.

VERATRUM. White Hellebore.

This genus is composed of hardy herbaceous perennials for ornament and variety in the pleasure-ground, and for medicinal use; are of the fibrous and tuberous-rooted tribe, rising with upright annual stalks, some a yard or more high, others hardly a foot, garnished with large, oblong, and spear-shaped, nervous leaves; and all the stalks and branches terminated by spikes of closely-placed hexapetalous flowers.

Class and order, *Polygamia Monœcia*.

Characters.] **CALYX**, hermaphrodite and male flowers separate on the same plant, all without any calyx. **COROLLA**, six oblong, spear-shaped, ferrated, permanent petals. **STAMINA**, six awl-shaped filaments, having quadrangular antheræ. **PISTILLUM**, three oblong, erect germens, terminating in a very short style, which in the males is scarce visible, and simple stigmas. **PERICARPIUM**, three oblong, erect, compressed, univalvular, unilocular capsules, opening on the inside; containing many oblong, compressed, membranaceous seeds.

There are three species, all very hardy perennials; the two first of which are tall growing plants, with large broad leaves; and the third is of much lower growth and narrower leaves, as in their descriptions below.

1. **VERATRUM album.**

White-spiked Russian Veratrum, or Common White Hellebore.] Hath a thick, fibrated, perennial root, crowned with large, oblong, oval, nervose leaves, near a foot long, and half as broad; upright, round, thick, very branchy stalks, three or four feet high, garnished with leaves diminishing gradually upward; and all the stems and branches terminated by decomposed or subdivided spikes of whitish-green, closely-placed flowers, having erect petals; appearing in May and June.

It inhabits the mountains of Russia, Siberia, and Austria, &c. but hath been long introduced into the English gardens, both as an ornamental and medical plant.

2. **VERATRUM nigrum.**

Black-spiked Hungarian Veratrum.] Hath a thick, fibrous, perennial root, crowned with large, long, nervose, yellowish-green leaves; upright, thick stalks, branching four or five feet high, garnished with a few leaves; and with all the branches terminated by compound, less divided spikes of dark-red flowers, having spreading petals; appearing in June and July.

It grows naturally in Hungary and Siberia.

3. **VERATRUM luteum.**

Yellow-spiked Virginia Veratrum.] Hath a bulb-like tuberous root, sending up oblong, spear-shaped, nervose leaves, spreading close to the ground; an upright single stalk, about ten inches or a foot high, garnished with a few close-fitting leaves, and terminated by a close, single spike of yellow flowers, in June and July.

All these three species are hardy herbaceous plants, durable in root, but annual in leaf and stalk, which rise in spring; the leaves rising large, broad, and folded, assume a singular appearance; and between them the flower-stalks of thick, robust growth, rising to a flowering state in May, June, and July; having all the branches terminated by the spikes of flowers, which singly are rather small; but are collected numerous and close in each spike, succeeded by ripe seeds in autumn, in the first and second sort particularly; and soon after the seeds are ripe, the stalks decay.

These plants have been long inhabitants of the British gardens, for variety and medical purposes; particularly the first and second sorts.

They all succeed in any common soil and exposure.

As to their general merit as ornamental plants, or for variety, &c. they having great singularity in their large furrowed leaves, as well as in their different modes of flowering, they demand culture in every herbaceous collection, disposed in the open borders and other compartments of the pleasure-ground; in which they will effect a most agreeable diversity, in spring and summer.

Likewise, as medical plants, the first sort in particular (*Veratrum album*), is in great repute: the root of which forms a powerful sternutatory powder; and for which purpose, the plants may be planted in any bed or border of common earth.

The propagation of all the three species is by seed, and by parting the roots.

By Seed.—This may be sown either in autumn, soon after it is ripe, or in spring, in a bed of light earth, and raked in; and they will come up in April or May, giving occasional watering and weeding; and in July or August, prick them out in nursery-rows, to remain a year or two to grow strong; then transplanted where they are to remain.

By parting the Roots.—Autumn, when the leaves decay, or early in spring, before new ones shoot forth, is the proper period; when the roots may be divided into several slips, not too small, and planted at once where they are always to stand.

VERBASCUM.

Mullein.

The plants are hardy, herbaceous, perennials, biennials, and annuals, proper to diversify the borders and other compartments of the pleasure-ground as flowery plants; also for medicinal preparations; all of the fibrous-rooted tribe, sending up erect stalks, mostly tall, from two or three, to four or five feet stature; and some of much lower growth, garnished in the different sorts with oblong and oval leaves, and monopetalous, rotaceous flowers, in spikes, and singly at the sides and ends of the branches.

Class and order, *Pentandria Monogynia*.

Characters.] CALYX is small, monopetalous, acutely five-parted, and permanent. COROLLA is monopetalous, wheel-shaped, with a very short cylindric tube, and spreading brim cut into five oval segments. STAMINA, five awl-shaped, declinated, shortish filaments, having roundish, compressed, erect antheræ. PISTILLUM, a roundish germen, filiform inclining style, and a thickish, obtuse stigma. PERICARPIUM, a roundish, bilocular capsule opening at top, and numerous angular seeds.

There are many species of *Verbascum*, some perennial, others biennial and annual, as before noticed; and the most material sorts thereof are the following nine; though the first three or four sorts are the most common in the English gardens.

1. VERBASCUM *ferrugineum*. (*Perennial*.)

Iron-coloured Moth Mullein.] Hath a perennial root; oval-oblong, slightly-crenated leaves; upright stalks, three or four feet high, terminating above in long loose spikes of yellowish iron-coloured flowers.

2. VERBASCUM *nigrum*. (*Perennial*.)

Black Mullein with a yellowish-purple flower.] Hath a perennial root; oblong, heart-shaped, foot-stalked leaves, eight or ten inches long, hoary underneath; upright, angular stalks, four or five feet high, garnished with a few narrow leaves, and terminated by long spikes of yellow flowers with purple antheræ.

It grows by way sides, &c. in England, and most parts of Europe.

3. VERBASCUM *Phæniceum*. (*Perennial*.)

Purple Moth Mullein.] Hath a perennial, and sometimes a biennial root, sending up oval, crenated, rough-spreading leaves; an upright stalk about three feet high, almost naked of leaves; and purplish flowers along the side of the stalk and branches.

4. VERBASCUM *myconi*. (*Perennial*.)

Myconic Borage-leaved Mullein.] Hath a perennial root, crowned with oval, thick, crenated, woolly leaves, spreading flat on the

ground; slender, naked foot-stalks four or five inches high, divided upward into smaller, each terminated by one large blue flower. Is a native of the Pyrenees.

5. VERBASCUM *Thapsus*. (*Biennial*.)

(Thapsus)—*Great White Mullein, or High Taper.*] Hath a biennial root; long, broad, whitish leaves, woolly on both sides; an upright, thick, firm, single stalk, five or six feet high, garnished with decurrent, woolly leaves, and terminating above in a long thick spike of yellow flowers.

It grows naturally in England, &c. by way-sides, and other uncultivated sterile places; but retained in gardens for variety, and as a medicinal plant.

6. VERBASCUM *Thapsoides*. (*Biennial*.)

(Thapsoides)—*or Branching Great Mullein.*] Stem tall, branching; oblong decurrent leaves; and the branches terminated by long spikes of flowers.

7. VERBASCUM *sinuatum*. (*Biennial*.)

Sinuated Mullein.] Hath a biennial root; oblong, sinuated, pinnated leaves; an upright, firm stem, four or five feet high, having the primary or first branches opposite, and garnished with oblong, amplexicaule, naked leaves; and clusters of yellow flowers along the sides of the branches. Grows naturally in France and Italy.

8. VERBASCUM *phlomoides*. (*Biennial*.)

Phlomoide Mullein, with a large Yellow Flower.] Hath a biennial root; oval leaves, woolly on both sides; an upright, purplish stalk, four or five feet high, garnished with small, oval, hoary leaves, the lower ones having foot-stalks; and the stalks terminating in thick spikes of large, yellow flowers. Grows naturally in Italy.

9. VERBASCUM *Lychnitis*. (*Biennial*.)

(Lychnitis)—*or Hoary white Mullein.*] Hath a biennial root; large, oblong, wedge-shaped; woolly leaves; an upright stalk, three or four feet high, garnished with white leaves, and small white flowers in spikes at the joints and ends of the stalk and branches. Grows in England, &c. in sandy, chalky situations.

Variety.] With yellow flowers.

10. VERBASCUM *Blattaria*. (*Annual*.)

Amplexicaule-leaved Moth Mullein.] Hath an annual root; upright stalk four or five feet high; oblong, smooth, sinuated, complexicaulous leaves; and yellow flowers singly along the sides of the stalk and branches. Grows naturally in England, &c.

Variety.] With white flowers.

All these ten species of the *Verbascum* are of the herbaceous tribe; the first four are perennials

ennials with durable roots, the next four biennials, and the last of all is an annual; most of which rise with erect tall stalks in the spring, attaining to full height, and flower in June and July: all the flowers are monopetalous and five-parted: and produced in spikes and other modes of flowering, as in their respective descriptions; are mostly of an odoriferous nature, and are succeeded, in most of the sorts, by ripe seeds in August or September.

They are all very hardy plants, that will prosper in any common soil and exposure in the common borders, &c. of a garden.

Considered as garden plants, they merit admittance, to diversify the large borders and other similar compartments of the pleasure-ground; particularly the larger sorts, which though not so ornamental as some, yet by their different foliage, luxuriant stems, and different colours and modes of flowering, they will effect a conspicuous variety.

Method of Propagation.

They are propagated by seed and off-sets of the roots.

By Seed.—Sow it either early in autumn or spring, in a bed or border of light earth, and raked in: and when the plants are come up three inches high, plant them out either in the borders to remain, or in nursery-lines till autumn, then transplanted finally; though the annual sort should be planted out early in summer to remain, or sown at once in patches where the plants are intended to stand.

By Off-sets.—All the perennial sorts furnish off-sets from the sides of the roots, which may be detached in autumn, or early in the spring, and planted either where they are to remain to flower, or in nursery-rows till autumn, then removed to the borders, &c.

VERBENA. Vervain.

A genus consisting principally of herbaceous perennials, eligible as garden plants; furnishing hardy kinds for the pleasure-ground, and tender exotics for the green-house and stove-collections; rising with upright stalks, two or three to five or six feet high; roundish-oblong, hastated, spear and heart-oblong leaves, and mostly terminal spikes of monopetalous tubular flowers, having angular, tubulous, quinque-dent permanent calyxes; a cylindric funnel-shaped, curved corolla; two stamina, or some species, four; a four-cornered germen; single style; succeeded by naked seeds lodged in the calyx.

Class and order, *Diandria Monogynia*.

The principal species are,

1. **VERBENA officinalis.**—Official, or Common Vervain.

2. **VERBENA hastata.**—Hastate-spear-leaved Vervain.

3. **VERBENA bonariensis.**
[*Tall Bonarian Vervain.*] Upright stems, four to five or six feet high; spear-shaped amplexicaule leaves; and clustered spikes of blue flowers, with sometimes four stamina.

4. **VERBENA indica.**
[*Indian Smooth-stalked Vervain of Ceylon.*] Upright smooth stalks; lance-ovate leaves; oblique dentated and long naked spikes; with flowers having two stamina.

5. **VERBENA Jamaicensis.**
[*Jamaica Hairy-stalked Vervain.*] Stalks hairy; leaves spatulate-ovate, sawed; and longest naked spikes of flowers, with two stamina.

6. **VERBENA mexicana.**
[*Mexican Loose-spiked Vervain.*] Stalks four-angled; hearted-oblong leaves; and loose spikes of roundish, twin-growing hispid flowers, with two stamina; the calyx of the fruit reflexed.

Of the above six species of Verbena, the first two sorts are hardy perennials for the borders of the pleasure-ground; and the officinal sort also as a valuable medicinal plant; both of which are propagated by off-sets and seed; the other four species are tender exotic perennials for the green-house and stove; of which the third and fourth are commonly retained as green-house plants of the ornamental flowering kind, producing their flowers in autumn; sometimes succeeded by ripe seed, by which they may be raised in the spring, assisted by a hot-bed; also by dividing the roots, and by cuttings of the young stalks: and the fifth and sixth sorts, less generally known, are assembled in some stove collection for variety; in which they are propagated by off-sets, slips, cuttings, and seeds.

VERBESINA, Indian Hemp Agrimony.

Comprehends for the stove some herbaceous, and ligneous, ornamental flowering exotics, rising with upright stalks, two or three to five or six feet high, garnished with ovate, and lanceolate leaves, and compound, orange-coloured and yellow flowers at the axillas and termination of the stalks; having a concave general calyx, composed of a double series of leaves, including many funnel-shaped, hermaphrodite florets in the disk; having each five stamina, and flat female florets compose the radius; and in all the florets a germen and style, succeeded by angular seeds.

Class and order, *Syngenesia Polygamia Superflua*.

The principal species are,

1. *VERRESINA alata*.

Winged-stalked Orange-coloured Verbesina of Curassao.] Leaves obtuse-ovate, waved, decurrent, and placed alternate; and many orange-coloured flowers.

2. *VERBESINA fruticosa*.

Shrubby American Verbesina.] Shrubby stalk and branches; and oval, serrated leaves, furnished with foot-stalks.

3. *VERBESINA chinensis*.

China Verbesina.] Leaves spear-shaped-ovate, serrated, and alternate; and having footstalks.

These plants being exotics, principally from hot countries, require the protection of our stoves, or very warm green-house, but chiefly the former department, especially the first sort, which is the most noted as a very ornamental flowering plant, producing many orange-coloured flowers, from July till the end of autumn; and which, and the other two, are propagated, by seeds, in a hot-bed, in the spring, and by slips, off-sets, &c. continuing them always in pots of light good earth, and retained as above.

VERONICA.

Speedwell.

This genus consists of many herbaceous perennials, &c. and one shrubby: some of them retained in gardens for variety; rising, some with trailing, and others with erect stalks, from five or six inches, to so many feet high, adorned mostly with smallish, oval, oblong, and spear-shaped leaves, and of other different forms in the several species; and monopetalous, wheel-shaped, four-parted flowers, in spikes and bunches, at the sides and ends of the branches.

Class and order, *Diandria Monogynia*.

Characters.] CALYX is divided into four spear-shaped segments, and permanent. COROLLA is monopetalous, wheel-shaped, and divided above into four oval segments. STAMINA, two rising filaments, with oblong antheræ. PISTILLUM, a compressed germen, slender declining style, and simple stigma. PERICARPIUM, a heart-shaped, compressed, quadrivalve, bilocular capsule, having many roundish seeds.

There are upwards of thirty species of *Veronica*, mostly herbaceous perennials and annuals; a few of the former are the most remarkable, some as medical plants, and for variety; others as showery ornamental plants to decorate the compartments of the pleasure-ground, and are mostly all of the fibrous-rooted tribe; some natives of England, and some are exotics from different distant parts

of Europe and America; and are all of hardy growth.

1. *VERONICA officinalis*.

Common Officinal Speedwell.] Grows with low procumbent stalks, rooting at the joints; oval, serrated leaves, placed opposite; and the stalks terminated by spikes of small blue flowers.

It is a native of woods, commons, and sterile pastures in England, &c. and is a valuable medicinal plant.

2. *VERONICA serpyllifolia*.

Mother-of-Thyme-leaved Speedwell, or Paul's Betony.] Hath trailing stalks, branching and rooting at the joints; small, oval, smooth, crenated leaves; and white flowers in racemous spikes terminating the branches.

It inhabits moist meadows in England, &c. and is sometimes used in medicine.

3. *VERONICA hybrida*.

Hybridan Speedwell, or Welsh Veronica.] Rises with an erect, branchy stalk, eight or ten inches high; oblong, obtuse, serrated, rough leaves, placed opposite; and the stalks and branches terminated by long spikes of blue flowers. Grows on the mountains in Wales, &c.

4. *VERONICA siberica*.

Siberian Septifolious Veronica.] Rises with upright, firm, hairy stems, four or five feet high; broad, oval, spear-shaped leaves, by sevens, surrounding the stalk in a verticillus; and the stalks terminated at top by long spikes of blue flowers.

5. *VERONICA virginica*.

Virginian Quaternate-leaved Veronica.] Rises with upright stalks, four or five feet high, garnished with spear-shaped, quaternate, and quinate leaves; and terminated by long spikes of white flowers.

Variety.] Ruddy, or blush-flowered.

6. *VERONICA austriaca*.

Austrian Blue Veronica.] Rises with upright, branchy stalks, three feet high; linear-spear-shaped leaves, cut pinnately; and spikes of blue flowers at the sides of the stalk and branches.

7. *VERONICA maritima*.

Maritime or Sea Veronica.] Rises with erect stalks two feet high; spear-shaped, unequally serrated, ternate leaves; and the stalks terminated by spikes of bright-blue flowers. Grows near the sea in several parts of Europe.

Varieties.] White-flowered—Flesh coloured flowered.

8. *VERONICA incana*.

Hoary Tartarian Speedwell.] Rises with an erect, hoary stalk, a foot high; oblong, crenated,

nated, hoary, opposite leaves; and the stalks terminating in erect spikes of blue flowers.

9. *VERONICA Teucrium*.

Germander Speedwell.] Rises with erect stalks, three or four feet high; oval, obtuse, indented, rough leaves; and long spikes of blue flowers at the sides of the branches. Is a native of Germany.

10. *VERONICA longifolia*.

Long-leaved Veronica.] Grows two feet high, with spear-shaped, acute, serrated, shining-green leaves, placed opposite; and the stalks terminated by long spikes of blue flowers. Grows naturally in Italy.

11. *VERONICA decussata*.

Cross-leaved shrubby Veronica from Falkland Islands.] Rises with a shrubby stem and branches, of bushy growth, several feet high; with branches numerous, round, smooth, garnished with small, oblong-oval, pointed, opposite leaves; and towards the top of the branches, clusters of funnel-shaped, white, very fragrant flowers.

All these plants of the first ten species, are hardy herbaceous perennials, with fibrous roots of long duration, sending up new stalks annually; arriving to full growth in May, June, and July, when they flower abundantly in spikes and clusters as in their descriptions; each spike and cluster composed of many separate flowers, all monopetalous, wheel-shaped, and divided into four parts, and succeeded by ripe seed in August and September.

They are all hardy enough to grow any where in a garden; but are generally the most prosperous in somewhat shady moist situations.

Their merit for garden culture is principally for variety and ornament to the common borders, &c. as flowery plants; and being arranged in concert with other hardy perennials, they will effect an agreeable diversity in the summer time, when in flower.

Many of these plants are kept in the public nurseries for sale, and may be transplanted in autumn or spring in the gardens, where they will flower annually, and increase considerably by the roots.

They are propagated by parting the roots, and by seed.

By parting the Roots.—This may be effected either in autumn or spring, by taking up the plant and dividing the roots into separate slips, not too small; and planted either where they are to remain, or in nursery-beds for a year, or till wanted.

By seed.—Sow it in autumn or in spring in any bed or border, and raked in; and when the plants are come up and a little advanced

in growth, plant them out either to remain or in the nursery.

The eleventh species is of large shrubby growth, and is easily propagated by cuttings and layers of the young branches.

VERTICILLUS, a Whorl.

A mode of flowering, in which the flowers are placed in whorls or rings round the joints of the stalk as in balm, sage, hyssop, &c.

The Verticillus is also applicable to leaves when placed three or more together in a ray round the stem or branches; likewise branches when they are produced in a radius or ring round the stem, in a circular manner.

VIBURNUM.

Wayfaring Tree, Guelder Rose, Laurustinus, &c.

This genus comprises a fine collection of elegant deciduous and evergreen flowering shrubs, great ornaments to the shrubbery and other hardy plantations, rising with upright branchy stems, some fifteen or twenty feet high, others not half so much; adorned with heart-shaped, roundish, lobated, and oval leaves in the different species; and numerous small, bell-shaped, five-parted flowers in large cymose-umbellate clusters at the termination of the branches, appearing very ornamental.

Class and order, *Pentandria Trigynia*.

Characters.] CALYX is small, five-parted, and permanent. COROLLA is small, monopetalous, bell-shaped, and divided into five obtuse reflexed segments. STAMINA, five awl-shaped filaments, with roundish antheræ. PISTILLUM, a roundish germen under the corolla, no style, but a turbinated gland instead of it, and three stigmas. PERICARPIMUM, a roundish unilocular berry, with one roundish hard seed.

To this genus is added the *Opulus* or *Guelder Rose*, and the *Tinus* or *Laurus Tinus*; consisting in the whole of nine or ten species, all of the hardy tree and shrub kind, seven or eight of which being of the deciduous kind, and one is an evergreen.

Deciduous Kinds.

Under this head is comprised the common *Viburnum*, *Opulus* or *Marsh Elder*, and *Guelder Rose*, and five or six other species, all of the deciduous kind, or such as shed their leaves in winter; some are of English growth, others from America, and garnished mostly with large, heart-shaped, round, and lobated leaves, and numerous small white flowers, collected in cymose umbels at the ends of the branches, as in their description.

1. *VIBURNUM Lantana*.

Common Viburnum, Wayfaring, or Pliant Meally

Meally Tree.] Rises with a woody stem, branching twenty feet high, having very pliant shoots covered with a lightish-brown bark; large heart-shaped, veined, serrated leaves, white and hoary underneath; and the branches terminated by umbels of white flowers, succeeded by bunches of red berries. Grows naturally in England in hedges, by road-sides, &c.

Varieties.] Striped-leaved—Oval-leaved.

2. *VIBURNUM Opulus.*

Opulus Marsh Elder, or Guelder Rose.] Consisting of the two following varieties, one with flat-flowers, the other globular, viz.

Flat umbelled Guelder Rose, or Common Marsh Elder.] Grows eighteen or twenty feet high, branching opposite, of an irregular growth, and covered with a whitish bark; large lobated or three-lobed leaves on glandulose foot stalks, and large flat umbels of white flowers at the ends of the branches, succeeded by red berries. Grows naturally in England in marshy places.

Globular-umbelled Guelder Rose, or Rose Marsh Elder.] Grows fifteen or eighteen feet high, branching like the other, garnished with large lobated or three-lobed leaves, on glandular foot-stalks; and large globular umbels of white flowers at the ends of the branches, in great abundance.

Varieties.] Double-flowered—variegated-leaved.

This tree when in bloom exhibits a singularly fine appearance; the flowers, though small, are collected numerously into large globular white umbels round like a ball; hence it is sometimes called Snowball-tree.

3. *VIBURNUM prunifolium.*

Plum-leaved American Viburnum.] Grows ten or twelve feet high, covered with brown and reddish bark; roundish, crenated, serrated, smooth leaves; and the branches terminated by umbels of white flowers, succeeded by dark red berries, rarely ripening in England.

4. *VIBURNUM acerifolium.*

Maple-leaved Virginian Viburnum.] Grows eight or ten feet high; lobated leaves cut into three principal lobes, growing on smooth foot-stalks; and white flowers in umbels along the sides of the branches, rarely succeeded by berries in England.

5. *VIBURNUM dentatum.*

Dentated Virginia Viburnum.] Grows eight or ten feet high, having a smooth light bark; oval, dentated-serrated, plicated leaves; and large round bunches of white flowers at the ends of the branches, rarely succeeded by berries in England.

6. *VIBURNUM nudum.*

Naked-umbelled, or Laurustinus-leaved American Viburnum.] Grows ten or twelve feet high, very branchy on every side to the bottom, covered with a reddish or purple bark; large oval-spear-shaped, wholly entire leaves, of a shining-green colour; and the branches terminated by umbels of white flowers, resembling those of the common *Laurustinus*, not succeeded by berries in England.

Varieties.] Deciduous-leaved—Evergreen-leaved.

7. *VIBURNUM Cassinoides.*

Baylard Cassine, or Cassinoberry Bush.] Grows eight or ten feet high, branching numerously, assuming a bushy growth; small oval-oblong, crenated, smooth leaves placed opposite; foot-stalks, keeled, glandless, and small umbels of white flowers at the sides of the branches; is a native of Virginia and Carolina.

8. *VIBURNUM Lentago.*

Marginal foot-stalked Canada Viburnum.] Grows a large, branchy, tree-like shrub, with ovate, sharp-pointed, serrated, thick, smooth leaves, on long marginated foot-stalks.

All these deciduous *Viburnums* come out into leaf in April and May, and commonly flower in June and July, the flowers small, but collected numerously into cymose umbels; are very conspicuous, succeeded by large bunches of red berries in autumn; though seldom any but those of the *Lantana* and *Opulus* attain perfection in England.

Evergreen Kinds.

Under this head is comprised only one species (*Common Laurustinus*), a well-known old inhabitant of our gardens, furnishing several beautiful varieties, valuable both as fine, hardy evergreens and elegant flowering shrubs, remarkable for exhibiting their flowers in winter and early in spring, in defiance of the severest cold.

9. *VIBURNUM Tinus.*

Common Laurustinus, or Evergreen Viburnum.] Grows eight or ten feet high, or more, branching numerously from the bottom upward, assuming a close bushy growth; very closely garnished with oval, wholly entire leaves of a strong green colour, placed in pairs opposite, with the ramifications, hairy-glandulous underneath; and whitish and red flowers, collected numerously in large umbellate clusters all over the plant, at the sides and ends of the branches, in autumn, winter and spring, until March or April, exhibiting a most beautiful appearance.

Varieties.] Narrow leaved—Broad-leaved—Shining-leaved—Hairy-leaved—White striped-leaved—Yellow striped-leaved; all of which

which are of bushy, shrubby growth, closely garnished with leaves all the year, and produce a great profusion of umbellate flowers in winter and spring, as before mentioned.

All these different species of *Viburnum*, both deciduous and ever-green kinds, being of the tree and shrub kind, are woody and durable in root, stem, and branches; the first eight sorts are deciduous, and the ninth is an ever-green, and are all of hardy temperature, to grow freely in the open ground all the year, in shrubberies and other hardy plantations; though the *Viburnum Cassinoides* is rather somewhat tender in winter, whilst young, but may be gradually hardened to bear all weathers like the other sorts, especially if planted in a sheltered situation: but as it is sometimes liable to suffer in very severe winters, it is also advisable to keep some in pots to move under shelter occasionally in rigorous weather; however, all the other sorts, both deciduous and evergreen kinds, will succeed any where at all seasons without trouble.

With respect to their uses for garden culture, they all demand attention as furniture to diversify the shrubbery, and also other ornamental plantations of the tree and shrub kind; all of which may be procured at the public nurseries, at a moderate price, and may be transplanted almost in any open weather from October till March.

In their arrangement in the shrubbery, the deciduous sorts should be disposed principally with others of that tribe, and the *Laurustinus* may be planted both in the evergreen clumps, &c. and some distributed towards the fronts of the deciduous compartments, will exhibit a lively variety in winter and spring; and any of the principal ornamental-flowering sorts may be planted singly in any conspicuous borders, especially the globular Guelder Rose, and the *Laurustinus*; or some also in pots: generally permitting the whole, both the deciduous and evergreens, to assume nearly their own natural growth, except just retrenching occasional lower stragglers from the stem, and pruning long, irregular, rambling shoots of the head.

But the *Laurustinus* are also often employed to plant against unsightly walls, or other disagreeable fences in fore-courts, and other compartments near the main dwelling, &c. to hide their deformity from sight, by their perpetual verdure, and where they will also flower profusely, and have a very ornamental effect.

Sometimes also the *Laurustinus* is planted as detached objects in borders and capacious spaces of grass-ground, and there sometimes

trained to a single stem, a foot or two high, and encouraged to branch out into a close bushy round head; in which it has a pretty effect, both as an evergreen and flowering shrub; and as such is also very proper to plant in pots, to place occasionally to adorn any particular compartment.

Method of Propagation.

Many of the sorts may be propagated by seeds; all of them by layers, and many of them also by cuttings, likewise some by suckers.

By Seeds.—Most of the deciduous kinds may be raised abundantly from seeds in the open ground; some of them producing plenty of berries in England, others not; and those of most of the sorts may be had of the seedsmen; all of which may be sown in autumn or spring, in beds of common earth, and covered an inch deep; they will come up, some the first year, others not till the second; and when the plants are a year or two old, plant them out in nursery rows to remain till they acquire a proper size, of two or three to four or five feet, for the shrubbery, &c.

Or seed of the *Laurustinus* may be sown in pots in the spring, and plunged in a hot-bed, to forward their germination more effectually.

By Layers.—All the sorts, both deciduous and evergreen kinds, grow freely by layers, which is the most expeditious mode of propagating them, and may be effected in autumn, winter, or spring, though the sooner the better; chusing for this purpose the young lower branches, lay them and peg them down in the earth in the common way; they will all readily emit roots in spring and summer, fit for transplanting next autumn.

By Cuttings.—Most of the deciduous kinds, particularly, grow tolerably well by cuttings; though all the sorts, both deciduous and evergreen kinds, may be tried by this method; it is soon done, and autumn is the proper season; chusing cuttings of the robust young shoots, cut into moderate lengths, and plant them in any moist border in rows; many of them will root and shoot at top next summer, and form tolerable little plants the same year.

By Suckers.—Some sorts afford suckers from the roots, particularly the Guelder Rose, and sometimes the *Laurustinus*; which may be taken up in autumn or spring, with roots, and planted in the nursery, to obtain a proper growth for their respective purposes.

VICIA.

Vetch, or Tare, including also the Faba, or Bean.

They are hardy herbaceous annuals and perennials, principally for economical purposes,

poses, as the common Vetch for fodder to cattle, and the seeds for poultry, &c. and the Bean, both as a fine summer esculent for the table, to eat when green and young, and when dry to feed horses and hogs, &c. though some sorts, also both of the Vetch and Bean kinds, are proper to diversify the compartments of the pleasure-ground; all of which are of the fibrous-rooted tribe, and mostly rise with annual stalks, some long and trailing, as in most of the Vetch kinds; others erect, as in all the Bean tribe; garnished mostly with pinnated leaves of several pair of lobes, and papilionaceous flowers along the sides of the branches.

Class and order, *Diadelphia Decandria*.

Characters.] CALYX is monophyllous, tubulous, and five-parted at top. COROLLA is papilionaceous, with an oval, broad vexillum, reflexed on the sides, two almost heart-shaped wings, and short keel, with an oblong, two-parted claw or tail. STAMINA, ten diadelphous filaments, having roundish; four-furrowed, erect antheræ. PISTILLUM, a long, narrow, compressed germen, filiform style, and obtuse stigma, bearded underneath. PERICARPIUM, a long, leathery, bivalvular pod of one cell, containing several roundish and compressed seeds.

There are about eighteen species of *Vicia*, mostly of the Vetch Tribe, and only one species of the Bean, which comprehends many varieties.

Vetch Kinds.

There are many species of the Vetch, though only a few of them have merit for general culture; some to cultivate in the fields to cut green for fodder, and to stand to ripen seed, (Tares) to feed pigeons and other poultry, hogs, &c. and some to cultivate in gardens for variety; consisting of annuals, biennials, and perennials, mostly with long, somewhat trailing, or climbing stalks, and some erect; all garnished with pinnated leaves of many pair of small lobes, terminated mostly by cirrhi or tendrils for climbing; and flowers generally from the sides of the branches, either singly or by twos, or many together on each peduncle, in spikes, &c. succeeded by oblong pods filled with small roundish seeds.

The most remarkable species for use or variety are,

1. *Vicia sativa*. (*Annual*.)

Common cultivated Vetch or Tare.] Rises with weak, angular, streaked, declinating stalks two or three feet long, garnished with pinnated leaves of seven or eight pair of oblong blunt lobes, and spotted stipula; and purple flowers generally two together, succeeded by erect pods in pairs, containing a few round seeds.

Varieties.] Common purple-flowered as above—White-flowered—Early summer Vetch—Black-seeded—White-seeded, &c.

This species is the sort of Vetch or Tare that is commonly cultivated in fields, to cut green for summer fodder, which is excellent feed for horses, &c. and some also to stand to bring forth seeds for the uses before hinted.

2. *Vicia narbonensis*. (*Annual*.)

Narbonne Vetch or Tare.] Long climbing cirrhous stalks; pinnated leaves of about six ovalish folioles; denticulated stipulæ; dark-purple flowers, and erect sessile feed-pods by threes.

3. *Vicia biennis*. (*Biennial*.)

Biennial multiflorous Siberian Vetch.] Grows five or six feet long, having large pinnated leaves of ten or twelve or more spear-shaped, smooth lobes on furrowed foot-stalks, and each peduncle having many light-blue flowers, arising at the sides of the branches, succeeded by short compressed pods.

4. *Vicia sylvatica*. (*Perennial*.)

Wood multiflorous Vetch.] Rises with cirrhose, climbing stalks, five or six feet long; pinnated leaves of seven or eight pair of oval lobes, and denticulated stipulæ, and each peduncle supporting many pale-blue flowers; grows wild in England, &c. in woods and among bushes and hedges.

5. *Vicia Cracca*.

Imbricated or Tufted Vetch.] Rises with climbing stalks five or six feet long; pinnated leaves of ten pair of spear-shaped, hairy lobes, and entire stipulæ; and peduncles supporting each many blue imbricated flowers. Is a native of England and most parts of Europe.

6. *Vicia cassubica*.

Cassubian Ligneous Vetch.] Hath trailing stalks two or three feet long, becoming somewhat ligneous; pinnated leaves of eight or ten pair of oval, acute, lobes, and entire stipulæ; and each peduncle having about six pale-blue flowers. Is a native of Germany.

The above six species are the most noted sorts of the Vetch or Tare kind, some of which being in great estimation for field culture, to produce green fodder as before noticed; but the first sort, in particular, having the most succulent stalks, are in most esteem for general culture, being generally cut whilst the stalks are green and tender, till they come into flower in June and July.

They are also sometimes introduced into gardens, as climbers, for variety, especially to diversify wood-walks, thickets, &c. to climb upon the shrubs and bushes; sowing the seed in the places where the plants are designed to remain, and they will readily come up and flower

flower ornamentally in summer. See their *Propagation* below.

As all the sorts rise with long weak stalks, somewhat resembling the pea tribe, they either trail on the ground or climb upon any adjacent support, or upon one another, by means of their cirrhi or clasps, at the termination of the leaves; and by which they mount upon bushes or hedges, &c. several feet high, shooting up into stalk in spring, and flower in June or July; all producing papilionaceous or butterfly-shaped flowers, some but two on each peduncle, and some many as before observed, succeeded by longish pods of the leguminous kind, containing round seeds, ripening in autumn.

Method of Propagation, &c.

All the sorts are easily propagated by seeds, sown principally where the plants are to remain in autumn or spring, both for field culture and in gardens.

For Field Culture.—They are sown both in autumn or spring occasionally: when intended to raise a crop to cut for early fodder, they are often sown in autumn, about August or early in September, in order that they may come up soon after the same year, and afford an early cutting next summer; though they may also be sown in spring both for fodder and to stand to produce seed or Tares; remarking, however, the summer Vetch in particular, being somewhat tender, should never be sown till the spring; observing in sowing the different sorts, that the common allowance of seed is generally about two bushels to an acre, which may either be sown broadcast and ploughed or harrowed in, or in drills, two or three feet asunder, and earthed over an inch or two deep: that by sowing them in drills, the ground can be readily hoed between by horse or hand hoeing, to kill weeds, and land up the plants, as practised for peas.

For Garden Culture.—When intended to cultivate any of these plants in gardens for variety, sow the seeds in autumn or spring, some in any large open flower borders, and some in the borders of shrubberies, wood-walks, wildernesses, thickets, &c. in the places where they are to remain, in patches near the shrubs and bushes to climb thereon, or in open spaces to climb upon sticks.

Faba or Bean Kinds.

To this genus *Vicia*, is added the article *Faba* or Bean, formerly considered as a distinct genus; but its general characters proving the same as the Vetch, the botanists have ranged it as a species of that family, by the name of *Vicia Faba*; consisting of but one species only, which, however, comprises numerous vari-

eties, and is supposed the Common Field or Horse Bean is the original sort, and parent of all the other varieties commonly called Garden Beans.

7. *VICIA Faba. (Annual).*

(Faba) or cultivated Garden Bean.] Hath fibrous roots; upright, thick, succulent, firm stems, rising from one or two to four feet high or more, garnished with large winged succulent leaves of two or three pair of large lobes, without cirrhi or clasps; and numerous papilionaceous, white, and black-spotted flowers all along the sides of the stalk, succeeded by long, compressed pods, containing the Beans.

It is a hardy herbaceous annual, and said to be originally a native of Ægypt; but all the varieties have been long inhabitants of our gardens, and grow freely any where in the open ground.

Varieties.] There are numerous sorts of Beans, all varieties of the same species (*Vicia Faba*) for their general growth and structure, foliage, flowering, fruiting, &c. are exactly the same, and only vary more or less from one another in their size of growth, size of the leaves, pods, and Beans, times of attaining perfection, domestic properties, &c. for all the different varieties are subject to vary exceedingly; and as in the Common Field or Horse Bean, we shall often find some among them that vary considerably from the original, both in substance of stalk and pods; and from these variations, it is supposed, the different varieties of Garden Bean were first obtained, and by degrees improved by culture to their present state of perfection; all of which are also very apt to vary from one to the other, unless some attention is observed in saving the seed Beans from the best plants of the respective varieties; consisting of the following sorts, arranged under three heads, according to their growth and times of attaining perfection, viz. Small early Kinds—Middling Kinds—and Large late Kinds.

Small early Kinds.

Those under this head are of the lowest growth, rising only from about a foot and half to two and a half high, and some that scarcely obtain a foot stature; but all very great bearers with small pods and Beans, and are valued for arriving earlier to perfection than any other sorts; and are therefore proper to plant on warm borders and other similar compartments in autumn and winter for the early crops to gather in the middle or end of May, and in June.

Early Mazagan Bean.] Grows but half a yard or two feet high, with slender stalks fully loaded

loaded from bottom to top with very small pods, arriving to perfection in May or beginning of June.

This is one of the smallest and earliest of the tribe of Garden Beans.

Early Portugal or Lisbon Bean.] Grows two feet high or more, with somewhat stronger stalks and larger pods than the Mazagan Bean, arriving to perfection a few days after that sort.

Small Spanish Bean.] Grows stronger than the two former, with somewhat larger pods and Beans, arriving to perfection soon after the Portugal Bean.

Dwarf Fan or Cluster Bean.] Grows low, with several spreading stems from six to ten or twelve inches high, very fully loaded with small pods.

This is chiefly planted for variety or curiosity.

Most of these small Beans, if gathered while young, eat very sweet and palatable; particularly the first three sorts; but if suffered to attain full growth, or become the least black-eyed, they eat dry, coarse, and of a disagreeable relish.

These kinds have merit principally to plant for the earliest crops, and the first two or three sorts are the most eligible for that purpose; but the Mazagan kind is the earliest of all, proper to plant for the first crop, and the Portugal and Small Spanish Bean next; all of which are proper for planting early on warm south borders, or other sheltered sunny exposures, under or near walls, pales, or hedges, or any warm defended quarter, every month from October or November, till January or beginning of February; in order that if the first planting should fall by inclement weather in winter, the others may succeed; and if all the crops should survive the frost, they will succeed one another regularly in bearing; planting them in rows, ranging south and north, or as convenient, two feet and a half asunder, an inch and half deep, and two or three inches apart in each row; likewise may plant one row length-ways close along under a south wall, &c. Or any of those small Beans may be continued planting in succession if required, in the several spring months till May or June, or also in June or July for late crops, in which they will then sometimes succeed preferable to larger kinds.

But as to the Dwarf Bean, it is not proper to be planted for any general crop, only a few for variety; and for which purpose it may be planted either in autumn or winter, or in any of the spring or summer months till June or July, in rows two feet asunder, or in patches about the borders.

Middle-sized later Beans.

These sorts are of stronger and taller growth than those of the former class: they rising in stalks from two feet and half to a yard or more high, producing longish middle-sized pods of different lengths and thickness in the different sorts; being proper to plant for the first main crops, any time from November or December till February or March, to succeed the small early Beans, and will arrive to perfection for the table in June and July.

Long-podded Bean.] Rises with stronger stems, a yard or more high; a remarkable great bearer, producing very long, narrowish pods closely filled with oblong, middle-sized Beans.

Varieties of this are,] Early long-podded Bean—Tall long-podded Bean—Sword, or Turkey long-podded Bean, rising with stronger stalks producing the largest and longest pods, well filled with fine large Beans: most excellent to plant for a main crop.

All these long-podded Beans are remarkable great bearers, very profitable for a family and market, and if gathered for use while they are moderately young, they will eat tolerably sweet and well flavoured.

Broad Spanish Bean.] Grows moderately strong, a yard or more high, producing broadish pods and Beans; is a very good bearer, and the Beans boil tender and well flavoured.

White-blossomed Bean.] Grows two feet and half high, producing entire white flowers, and great abundance of smallish, long, narrow pods, filled with smallish oblong Beans.

This is a good bearer and excellent table Bean, remarkable for boiling green and tender, and is eligible to plant both for a secondary early production, and also similarly for middle and late crops; even to plant so late as June and July for young autumn Beans, in August and September.

Green Nonpareil Bean.] Grows about two feet and half to a yard high; very productive in numerous small longish pods, well filled with small very green Beans, sweet and tender eating while quite young.

The dried seed Beans of this sort are of a pale-green colour, and generally permanent.

Red-blossomed Bean.] Rises with firm stalks two feet and half high, producing entire red blossoms, succeeded by smallish pods and Beans not near so palatable to eat as the white blossom kinds.

Other less material varieties of middle-sized Beans are Mumford Bean—Black-blossomed Bean—Green Venetian Bean.

Remark, that of the above varieties of Bean ranged in this class, the first three sorts, Long Pods,

Pods, Broad Spanish, and the White-blossomed Bean are the best for general culture; though some of all the others may also be planted occasionally for variety and experiment; and the season for planting all the sorts is, that for the first crop may plant in November or December on some broad warm border, or in any of the most sheltered kitchen-garden quarters, in rows, two feet and half or a yard asunder; three inches distance in the row, and two or three inches deep: repeating the planting every month till March in the open quarters or in fields, &c. after that, if a longer succession of those sorts is required, plant some every three weeks in an open exposure, till May or June.

Larger late Kinds, commonly called Broad Beans.

These are the strongest growers of all the kinds; they rise with thick stems three feet and half high or more, producing large broad pods with Beans proportionably large; and are superior to all the others to plant for the general crops, to succeed the long pods, and others of that class; being proper to plant principally in the spring, or at least not earlier than December or January, for the first crop; and for the general crops, should be planted every month or three weeks, from January or February, until May; and they will arrive to perfection in July or August, and are all most excellent family beans, and always the most saleable in markets.

Sandwich Bean.—Grows three feet and a half high or more, producing large, broad pods, and oblong broadish Beans; and bears abundantly.

Toker Bean.—Grows strong, three feet and a half high, or more, producing long broadish pods, and large oblongish Beans, and the plants bear very plentifully.

Windfor Bean.—Rises with very large, strong stems, three or four feet high, bearing very large, broad pods, having very large, roundish broad Beans, the largest of all the Bean tribe, and the most excellent for eating.

Of this class of large Beans, the Sandwich and Toker kinds being generally more plentiful bearers, and of somewhat less succulent growth than the Windfor, are rather hardier to resist the frost, and may be planted earlier, that is before Christmas, for the first crop; and any time after, till April or May, if required; but the Windfor may also be planted a small or moderate crop in December, in open mild weather, and a dry soil; the same in January, in a larger supply; and a first full crop in February: and thence may plant freely in full supplies, of these or any of the other larger sort,

every three or four weeks, till the end of April, for the main crops; or may continue planting them till the end of May, to continue the succession of these kinds for the table as long in the season as possible.

All of which large kinds of Beans should be planted in open exposures in gardens and fields; the first plantings before or soon after Christmas may be in the most sheltered, dry situation; after that the succession crops may be planted in any open exposure in gardens and fields; generally planting them by dibble in rows, a yard asunder, or three feet and a half for the large Windfor Beans, four or five inches asunder in each row, and three inches deep.

General Observations.

All the varieties of Bean in the above three classes, are hardy, herbaceous annuals, that will grow in any common soil of a garden, and in the open fields; are all raised annually from seed, planted at several different times, from October till May, in order to obtain a succession of young green Beans for the table three or four months in summer; for by planting early and late kinds every month, from October or November until March; and every three weeks or fortnight, from March till May, June, or July, a constant succession of young Beans is obtained from the latter end of May, or beginning or middle of June, until September, or beginning of October; though as to the general planting season, that after having planted a few of each sort before Christmas, to come in early, the main crops are planted in January, February, March, and April; and the general season of Beans in full perfection of bearing and goodness, is June, July, and August.

As therefore the utility of Garden-Beans, both for private use, and supply of the markets, is very considerable for about three months in summer, a principal share of kitchen-garden ground and field-land should be allotted annually for the culture of the several different crops, succeeding one another in bearing in regular succession from May or June till August or September, as before observed.

They will all grow freely in any common fertile soil, in a garden or field, but should be allowed always an open, free situation, not much overspread with trees, &c. which would draw them up weak and tall, without yielding any considerable produce; generally allowing the warmest dry situations for the early crops before Christmas; but the succeeding ones may after that time be planted in any open exposure, as before observed; and for the late plantings,

plantings in May and June, &c. should generally chuse the moistest strong land.

As to the general method of planting and culture: all the sorts must be planted in rows, the distance before mentioned, according to the size of the Beans, planted either by dibble, or laid in drills; or for early planting in dry ground, may first draw shallow drills, then plant the beans in a row along the bottom; allowing from two to four or five inches distance in the row, according to the size or growth of the different varieties, and from one and a half to three inches deep in the small and large Beans; and when the plants are come up about three inches high, land or earth them up on each side of the row with a drawing hoe, keeping them clear from weeds by occasional hoeing in dry weather: and after having advanced nearly to full growth and in bloom, it is proper to top the plants in general, which throws all the nourishment to the embryo pods, and greatly promotes their setting, and forwards their growth; and in the latter crops prevents their being so much annoyed with the small black fly.

VINCA.

Perwinca, or Periwinkle.

This genus is composed of shrubby evergreen trailers and upright growers, for the shrubbery and stove collections, having all durable stems, and branches adorned with oval, oblong, and spear-shaped, ever-green leaves; and monopetalous, salver-shaped, five-parted flowers, at the axillas of the stalk and branches.

Class and order, *Pentandria Monogynia*.

Characters.] CALYX is divided into five parts, and permanent. COROLLA is monopetalous, and hypocratiform, or salver-shaped, tubular below with a horizontal, broad-spreading brim, cut into five obtuse segments. STAMINA, five short inflexed filaments, having obtuse, erect, membranaceous antheræ. PISTILLUM, two roundish germens, terminating in one cylindric style, larger than the stamina, having two stigmas, one orbicular, and the other headed and concave. PERICARPIUM, two long, cylindric, erect follicles, of one longitudinal valve, containing many oblong, cylindric seeds.

There are four species of *Vinca*, three of them common to the English gardens, two of which are hardy, trailing, and declinated plants for the shrubbery; the other is an upright, tender shrub for the stove collection; and are all of the ever green tribe.

Hardy Kinds.

These have slender stalks, some that trail and extend along the ground, branching nu-

merously, and cover the surface; others grow more erect, with declinated branches: and consist of two species, both evergreens, and natives of England, &c. growing wild, under bushes, hedges, and in woods; but are introduced into most of our eminent shrubberies, to plant as trailers in particular departments, between shrubs, to overspread the ground, and occasionally to mount erect, upon support, and form a bushy growth.

1. VINCA minor.

Minor or smaller Procumbent Periwinkle.]

Hath slender, ligneous, trailing green stalks, branching and running considerably along the ground, emitting roots at the joints; garnished with oval-spear-shaped, thick, smooth, shining-green leaves, in pairs opposite; and flowers growing singly on proper peduncles, at the sides of the branches, of different colours in the varieties.

Varieties are,] Common green Periwinkle with blue flowers—With white flowers—Double blue flowers—Double white flowers—Double purple flowers—Yellow-striped-leaved, with flowers of all the above colours—White striped-leaved, with flowers of different colours.

2. VINCA major.

Greater Upright Periwinkle.] Rises with shrubby, somewhat erect, green stalks, a foot or two high, with the tops inclining to the ground; larger, oval, shining-green leaves, in pairs opposite; and large blue flowers singly on foot-stalks at the axillas of the branches.

Variety.] With white flowers.

Both the species are perennial in root, stem, and branches, with leaves in perpetual verdure, and begin flowering in the spring, about March and April; the flowers moderately large, each being of one salver-shaped petal, spreading at the brim, and cut into five parts; generally continue flowering in succession several months, and even sometimes in winter, in mild seasons, especially the *Vinca major*.

As both the species and their respective varieties are very hardy plants, that prosper under trees and bushes, even in close thickets, &c. and spread and cover the ground, they are proper to plant towards the fronts or verges of shrubbery clumps, wildernesses, and thickets, between the trees and shrubs, next the walks, and on the sides of shady banks, &c. disposed, some to over-run the surface between the shrubs, in particular places contiguous to shady walks, &c. others in patches, to run and entangle with one another in tufts; and some planted entirely detached, particularly the *Vinca major*; and supported with stakes, and trained with an erect stem a little height, and

and encouraged to branch out above into a bushy head; in all of which modes of distributing them in the several plantations, they will encrease fast in growth, and effect a very pretty variety at all seasons of the year.

They are all expeditiously propagated by layers, cuttings, and suckers.

By Layers.—Their trailing branches being layed in the ground any how, at almost any season, they will most readily take root; and those of the *Vinca minor* particularly multiply exceedingly without care; for the trailing stalks root in the ground at every joint as they extend along, furnishing numbers of good-rooted plants in one summer, fit to plant off in autumn.

By Cuttings.—All the sorts will also readily grow by cuttings of the stalks and branches, planted in autumn or spring, in a shady border, and they will be well rooted by the following autumn.

By Suckers.—They naturally send up suckers from the root in summer, which may be taken up with roots any time in open weather, from autumn till spring, and planted where they are to remain.

Tender Stove Kind.

Consists of one shrubby species, a native of Madagascar, and is retained here in stoves, as an elegant evergreen, and beautiful flowering shrub.

3. *VINCA rosea.*

Rose Periwinkle of Madagascar.] Rises with an upright, shrubby, smooth, branching stem a yard or more high; having a brownish bark; oblong-oval, smooth, firm leaves, placed opposite; and large beautiful, rose-like, crimson, and pale-red flowers, singly and in pairs at the sides of the branches, being large, spreading above, and divided into five segments; appearing very ornamentally from spring till winter, succeeded by ripe seeds in the autumn.

Variety.] Rose Periwinkle with white flowers, having purple eyes.

This elegant little shrub being an inhabitant of the hot parts of Africa, in this country must always be kept in pots, in order to be retained in the stove; in which it will flower annually in great abundance, managing it as directed for other shrubby exotics of the stove. See STOVE PLANTS.

It is propagated by seed and cuttings, assisted by a hot-bed.

By Seed.—Sow it in the spring in a pot of light rich earth, half an inch deep, and plunge the pot in a hot-bed or in the bark-bed in the stove; and when the plants are come up about two or three inches high, prick them separately in small pots and plunged again in a hot-bed,

&c. giving occasional shade from the sun, and proper waterings; and as they advance in growth shift them into larger pots and keep them always in the stove.

By Cuttings.—In spring or summer take off some cuttings of the young shoots, plant them in pots; and plunge them in any hot-bed or in the bark-bed, and they will root the same year fit to pot off separately, and managed as directed for the seedling plants.

VIOLA.

Violet.

There are many species of Violets, mostly very low, herbaceous, fibrous-rooted perennials and annuals, some considered as flowery plants to adorn the fronts of borders, others for variety and medical purposes, rising with clusters of leaves and shoots but a few inches high, and low stalks the same height, crowned with small, irregular, pentapetalous flowers.

Class and order, *Syngenesia Monogamia.*

Characters.] CALYX is pentaphyllous, with the leaves oval-oblong, sharp at top and obtuse at the base; differently arranged in the different species, and persistent. COROLLA is irregularly formed of five unequal petals, the upper one is broadest, obtuse, and emarginated, having a corniculated or horned nectarium at the base; the two side-petals equal, obtuse, and opposite, and the lower ones larger and reflexed upward. STAMINA, five small filaments, two of them placed at the upper petal, entering the nectarium by their annexed appendages; and obtuse antheræ that generally coalesce or connect. PISTILLUM, a roundish germen, slender style, and oblique stigma. PERICARPIUM, an oval, trigonous, obtuse, trivalvous capsule of one cell, containing many oval seeds.

There are more than forty species of Violets, mostly very low, herbaceous plants; many of them natives of England, and other different parts of Europe, and of America; and but only a few of them have merit as garden plants for ornament or variety, consisting of some perennials and an annual; comprehending the Common Violet, &c. Heart's Ease or Pansies.

Perennial Kinds.

Consist of the common odoriferous Violet and varieties, and several others of less note; all hardy perennials of humble growth.

I. *VIOLA odorata.*

Odorous, or Common Sweet-scented March Violet.] Hath a fibrous perennial root, sending up a cluster of heart-shaped leaves and small, creeping, rooting shoots; and amongst them rise slender naked peduncles, three or four inches high, crowned with the flowers of different

different colours in the varieties, appearing in March.

Varieties are,] Common blue-flowered—Pale-purple-flowered—White-flowered—Double blue-flowered—Double white-flowered.

The flowers of all the varieties impart a fine sweet odour, and are used in medicine; though the single flowered kinds are the most odoriferous; but the double flowered varieties are largest and the most conspicuous to sight.

It grows naturally in woods, and under hedges, &c. in England and most parts of Europe, but has been a long resident of gardens, as a flowery plant, and for its flowers to use in medicine.

2. *VIOLA hirta*.

Hairy-leaved Inodorous Violet.] Hath a fibrous, perennial root, crowned with heart-shaped, hairy, hispid leaves; and amongst them slender peduncles, a few inches high, terminated by large blue flowers, like the common sort, but without odour; grows wild in woods and hedges in England, &c.

3. *VIOLA palmata*.

Palmated Virginia Violet.] Hath a perennial root, crowned with five-lobed, palmated, or hand-shaped, indented leaves, and low peduncles, supporting white flowers in May or June.

4. *VIOLA montana*.

Mountain upright Austrian Violet.] Hath a perennial root; erect stalks a foot high; heart-shaped, oblong leaves; and purple flowers at the axillas of the branches, in April and May.

5. *VIOLA calcarata*.

Calcarated, or Spur-flowered Yellow Alpine Violet.] Hath a perennial root, sending up very short stalks, four or five inches high, garnished with oblong-oval leaves, and slender peduncles, supporting yellow flowers, streaked with purple; having long spur or awl-shaped nectariums, longer than the petals; flowering most part of summer.

Varieties.] Common yellow purple-streaked-flowered—Plain yellow-flowered—Purple-flowered.

6. *VIOLA mirabilis*.

Marvellous-flowered German Violet.] Rises with short three-sided stalks; reniform-heart-shaped leaves; and the cauline flowers without petals.

7. *VIOLA biflora*.

Two-flowered Alpine Violet.] Kidney-shaped serrated leaves; and the stalks having two flowers.

8. *VIOLA pedata*.

Foot-shaped leaved Virginia Violet.] With-

out stalk; foot-shaped leaves cut into seven parts.

9. *VIOLA uniflora*.

One-flowered Siberian Violet.] Stalks having one flower; and heart-shaped, dentated leaves.

10. *VIOLA ceniffa*.

Ceniffian large blue Violet.] Slender suffructicose creeping stalks; oval, smooth entire leaves; and peduncles having large blue flowers.

11. *VIOLA canadensis*.

Canada American Violet.] Erect low stalks; and heart-shaped, pointed leaves.

Of the above eleven species of perennial Violets, the first sort (*Viola odorata*), is the most remarkable, being highly esteemed for its sweet-scented flowers; and is proper to plant on the verge of shrubberies, wood-walks, and in tufts or patches; and as to the other species, the first four of which are the most noted, and although their flowers are without scent, they, if arranged in concert with the varieties of the common sort, will effect an agreeable diversity. Any of the other species are also eligible to introduce for the same occasion.

Though, when the common Violet is intended to be cultivated for its flowers to gather, it may be planted in beds or borders alone; in rows, a foot asunder, and they will soon increase into large bunches.

They all flower in great abundance every year in their respective seasons; the flowers are small, irregular, and consist each of five unequal petals, continuing in succession three or four weeks, and are succeeded by ripe seeds in summer and autumn.

The propagation of all the sorts is by parting the roots, and sometimes by seed.

By parting the Roots.—They all multiply by the roots; and the common Violet and the other creeping kinds propagate also abundantly by their repent shoots rooting in the earth; they may be parted or slipped in spring, summer, or autumn, as soon as they have done flowering; when in moist weather, or early in spring, each plant may be slipped, or divided into several slips, not too small, and planted either at once to remain, or the weakest may be planted in nursery-beds, to have a summer's growth; and in either method each slip will soon increase into a large tuft, and flower abundantly next year.

By Seed.—Sow it either soon after it is ripe, or early in the spring, in a bed or border of light earth, and raked in; and when the plants are come up an inch or two high in summer, prick them out in a shady border, to grow

grow till October, and then planted out finally to remain.

Annual-biennial Kind; also Perennial occasionally.

One species only come under this head; a well-known, little, tufty, very flowery plant, commonly called Heart's Ease, or Pansy; and is generally considered as an annual, because, being raised from seed in spring, it flowers the same year, and sometimes decays in winter following, but not generally; and more commonly proves of a biennial or perennial nature, remaining in stalk and leaf all the year, in favourable seasons.

12. *VIOLA tricolor.*

Three-coloured Violet, commonly called Heart's Ease, or Pansy.] Hath a fibrous root, sending up slender, triquetrous, or four-square stalks, branching diffusely, from six to ten or twelve inches high, assuming a bushy, tufted growth, garnished with small, oblong-oval, cut leaves; and at the axillas of the branches numerous variegated, tri-coloured flowers, yellow, purple, and white, appearing in constant succession all summer and autumn; grows naturally in cultivated places in the north of England, &c.

Varieties.] Low growing, with small flowers—Larger upright, with large flowers—Large Dutch, with largest flowers—Variegated, yellow, purple and white-flowered—Yellow-flowered, with purple spots—Purple, with yellow or white spots—White, with yellow and purple spots—Entire yellow—Deep and pale yellow—Purple-flowered—Scentless flowered—Sweet-scented flowered.

All the varieties flower very profusely, and some variegated many different ways in the same plant; and the most prevailing colours are yellow, purple, blue, and white; some of which being of a fine velvety hue, particularly the purple, varying in different flowers, and all of which are succeeded by abundance of seed, which soon scatters itself in the adjacent ground, and from which numbers of plants naturally rise, without care of culture.

This elegant little plant merits culture in every garden, for the beauty and great variety of its tricoloured flowers; and it will succeed any where in the open borders, or other compartments, disposed in patches towards the front; either by sowing the seed at once to remain, or by putting in young plants previously raised in a seed-bed, or also by off-sets and slips: they will begin flowering early in summer, and will continue shooting and flowering in succession till winter,

and even during part of that season, in mild weather.

It is easily propagated in all the different varieties, abundantly by seed; also by off-sets, slips, and cuttings of old plants when increased into bunches.

The seed may be sown either at once, where they are to remain, or for transplantation; and when once a few plants are raised, and have flowered and ripened seeds, they will naturally sow themselves, and produce a constant supply of plants.

However, the season for sowing them is in autumn and spring; the autumn sowings come up the same year, stand the winter, and flower early in the spring following; and the spring-sown plants succeed them in flowering, and continue till winter. Sow them either in patches about the borders, half an inch deep, to remain, or in a bed or border, broadcast, and raked in; and when the plants are advanced two or three inches high, prick them out, to remain to flower, one or two plants in each patch, which will soon increase into a large tuft.

By Off-sets, Slips, &c.—Plants of any particular varieties, grown into large bunches, being generally furnished with many bottom off-sets, they may be slipped or divided with full roots, either in autumn, August, or September, or in the spring months, and planted either in the borders to remain, the larger full-rooted slips, or the smaller ones in beds, to grow stronger, then finally transplanted; or in spring or summer, slips or cuttings of the shoots planted in a shady border, watered at planting, repeating it moderately afterwards, in dry weather, they will strike root, and form proper plants; so that by these methods any particular variety may be readily increased, and the plants thereby continued permanent in their respective kinds in a perennial growth.

VISCUM, Mistletoe.

This genus furnishes but one species, an under-shrub evergreen of a singular nature, being of the parasitic tribe, not growing in the earth, but upon other plants, generally on the branches of soft-wood trees, commonly suspended from the under side of said branches, with its root upward and the head hanging down, in a forking-branchy, bushy growth; garnished with narrow spear-shaped stiff leaves, and small calycinal, apetalous yellow flowers, succeeded by white glutinous berries, ripe in winter.

Class and order, Diœcia Tetrandria.

Characters.] Male and female flowers on separate plants. CALYX of the male flower

is composed of four oval equal leaves. **COROLLA**, none. **STAMINA**, filaments none, but four oblong pointed antheræ, each growing to a foliole of the calyx. The female flowers consist of a calyx, composed of four small leaves, which are oval sessile, deciduous, and sitting on the germen; corolla, none. **PISTILLUM**, an oblong, three-cornered germen, situated under the receptacles, with no style, having only an obtuse stigma. **PERICARPIUM**, a round smooth berry with one cell, containing a single obcordated, obtuse, carnosé, and compressed seed.

We know but of one species,

Viscum album.

[*White-berried, or Common Mistletoe.*] Hath woody branches of a yellowish colour, usually growing in pairs, in a sort of a forked manner, dividing from near the base of the main stem, and annually subdividing in a dichotomous form; at the joints of the divisions grow the leaves, spear-shaped, obtuse, of a thick consistence and yellowish-green, continuing all the winter; and the flowers, produced in short spikes from the wings of the branches, are small, and of a yellowish colour, succeeded by large white viscous transparent berries, which are ripe in the winter.

This very remarkable plant is an inhabitant of our woods and orchards, growing upon the branches of ash, hazel, maple, crab, and apple trees, &c. as it will not grow by any means in the natural earth, like other plants; being produced from seed accidentally disseminated by birds, such as the Mistletoe-thrush, &c. feeding on the viscous berries, which casually adhering to their beaks, are thereby carried to the adjacent trees, and lodged on the branches; or probably sometimes by voiding the berries thereon, are washed by the rains to the under side, where, being affixed by their soft glutinous pulp, the seeds contained therein germinate and plant their radical fibres in the bark, running between that and the wood, and thence shoot out into a short robust stem and round bushy head, in a pendulous growth.

Thus, whoever may incline to raise this singular plant, may propagate it in his plantations, garden or orchard, &c. by procuring some of the fully-ripened berries in winter, and stick or rub them on some smooth part of the under side of the branches of any soft-wooded standard trees, as ash, hazel, apple, crab, &c. as before intimated, their glutinous matter will affix them close, where they will grow in the manner above related; though for the greater chance of success, may previously cut the outer bark a little in that part,

and also rub some berries on several different trees and branches, as they do not always effectually succeed.

It is probable the failure of success, sometimes happening, in endeavouring to propagate this plant by art, is owing to the nature of the berries, for being of the diœcious class, male and female flowers on separate plants, the berries gathered from female plants, not situated near a male, when in bloom, may be deprived of the *farina fecundans*, necessary to impregnate and fertilise the berries, which proving thereby abortive, will not grow; therefore it would be more effectual if they could be obtained with certainty from some female plants which grow near those of the other sex.

This plant is said to be possessed of peculiarly excellent medical virtues; and is used successfully in nervous affections.

VITEX. *Agnus Castus*, or Chaste Tree.

Of this genus there is one hardy species cultivated in our ornamental gardens; and two tender kinds for the green-house, all of shrubby growth, garnished with digitated, trifoliate, and quinquefoliate leaves, and ringent ornamental flowers growing in spikes and clusters.

Class and order, *Didynamia Angiospermia.*

[*Characters.*] **CALYX**, a short cylindrical monophyllous perianthium, indented in five parts. **COROLLA**, a ringent petal, with a slender cylindric tube; the limb is bilabiated, both lips are divided into three segments, the middle one being broadest. **STAMINA**, four capillary filaments; two of which are longer than the others, having versatile antheræ. **PISTILLUM**, a roundish germen, a slender style, and two awl-shaped stigmas. **PERICARPIUM**, a globular berry of four cells, each containing a single oval seed.

This tree was much celebrated among the ancients, on a supposition that the influence of it was conducive to chastity (whence the name); but the moderns know of no such peculiar virtue as has formerly been ascribed to it.

The species are,

Hardy Kind.

1: **VITEX**, *Agnus Castus*.

[*Agnus Castus*—or *Chaste Tree*.] Hath pliable branches, whose joints are long, rising to the height of about five or six feet; they are of a brownish-grey colour, and are garnished with digitated leaves, composed of several folioles, which are narrow and of a dark green colour, and ending in obtuse points; the flowers are produced at the ends of the branches in whorled spikes, which are pretty long, and

and of a bluish-purple colour; they appear in autumn, but are not succeeded by seeds in this country.

Varieties.] Narrow-leaved, having the folioles long and narrow—Broad-leaved, having broader and shorter folioles—Blue-flowered—White-flowered.

These are desirable deciduous shrubs for ornamental shrubbery compartments; will succeed in any common soil and situation; and may be planted in the usual seasons of autumn and spring.

They are easily propagated either by layers or cuttings any time in the autumn, or winter; will take root the following summer, and may then be taken up in autumn or the spring and transplanted.

Green House Kinds.

2. *VITEX trifoliata.*

Trifoliate Indian Chaste Tree.] Rises with a shrubby stem and branches six or seven feet high; leaves composed mostly of three oval entire lobes, sometimes five; and dichotomous panicles of white flowers.

3. *VITEX Negundo.*

Chinese Quinquifoliate Chaste Tree.] Rises with a shrubby stem and branches six or eight feet high; leaves composed of five spear-shaped sawed folioles; and clustered panicles of blue flowers.

Both these tender species require protection of a green-house in winter; therefore must be planted in pots of light mellow earth, and stationed with the green-house exotics, in which they will effect a conspicuous variety, and produce flowers in summer; and are propagated by layers in the spring; also by cuttings in pots plunged in a hot-bed, or covered close with a hand-glass, which will promote their rooting in a short time, for transplanting into separate pots in autumn following.

VITIS, Vine.

A genus of well known deciduous climbers, of which there are several species, one of which is universally noted and esteemed as a fruit-tree, for its many fine varieties of that most excellent fruit the grape; the other kinds are more noticed for singularity and variety, than the fruit they produce; some hardy for the full ground, others for the hot-house; all of the woody climbing kind; with long flexuose stems, branches, and shoots, rising by support to a considerable height and extent; producing many long trailing climbing, jointed shoots annually, advancing many feet in length in one summer; garnished at each joint with large, mostly simple, lobated leaves, singly, cut into three or five lobes, attended by climb-

ing tendrils; and clusters of small greenish flowers, arising on the same year's shoots; succeeded by large bunches or clusters of berryed fruit; ripening, in the first species, and varieties, with a most rich and delicious flavour in July or August, September and October.

Class and order, *Pentandria Monogynia.*

Characters.] CALYX, a very small perianthium, indented in five parts. COROLLA, five small petals, which are deciduous. STAMINA, five subulate, erect, patent falling filaments, with simple antheræ. PISTILLUM, an oval germen without a style, crowned with a blunt capitated stigma. PERICARPIUM, a large roundish berry of one cell, containing five hard roundish seeds, narrowed at the base.

Species.

1. *VITIS Vinifera.*

Common Vine or Grape Vine.] This hath lobate, sinuated, naked leaves, with herbaceous flowers, growing in a racemus which becomes a bunch of red, white, black, and other coloured berries, in the many different varieties,

Varieties of this species are,

(1.) *July Grape*, this hath a berry, small round, and black, slightly growing on the bunches, esteemed principally for its earliness, though rarely ripening in July, but soon in August.

(2.) *Black Sweet-water*, hath roundish berries, growing compactly together in small bunches; they ripen in August: the flavour being rich, and skin thin, invites the birds, flies, &c. to prey on them, which (in time) should be guarded against.

(3.) *White Sweet-water*, this is an exceeding fine flavoured grape when perfectly grown, but the berries being liable to outgrow each other, makes the whole bunch incomplete; this ripens about the end of August.

(4.) *Muscadine*, this is one of the finest white grapes which ripen against common walls in this climate; the bunches are large, the berries are round, and of a very rich flavour; this will ripen in September.

(5.) *Black Cluster Grape*, hath hoary leaves; the bunches are short and very compact; the berries are small, and ripen the end of September.

(6.) *Royal White Muscadine Grape*, larger full bunches, of fine large, round, white berries; ripening in great perfection against a south wall in September.

(7.) *White Cluster Grape*, short close bunches; ripe in September.

(8.) *Black Frontiniae*, hath shortish bunches, the berries of which grow pretty close to-

gether; when ripe, are round and of a deep black colour, covered with a mealy bloom; the flavour of this grape is very rich, of a muscat taste, and in very hot summers will ripen on a south wall naturally in October.

(9.) *Red or grizzly Frontinac*, hath middling-sized bunches; the berries are round, of a red colour, and striped; this grape, when thoroughly ripe, is of a most rich and excellent flavour: it rarely ripens well in this climate without the assistance of heat.

(10.) *White Frontinac*, this is a high flavoured grape, and hath a peculiar rich juice when perfectly ripe; the bunches are large, and the berries, which are round, are very closely joined to each other, whereby they are apt to rot each other before they are ripe, which in some measure is owing to the thinness of their skins; it is therefore necessary to thin them out when they are about the size of peas, whereby the sun and air will have freer admittance, and those which are left will be larger, more handsome, and higher flavoured; this grape will not succeed without artificial heat.

(11.) *Muscat of Alexandria*, hath long bunches, with oval large berries; there are two sorts, one with white, and the other with red berries; they are a fine grape, but require a hot-house to perfect the fruit.

(12.) *Hamburgh Red and Black*, hath very large bunches; the berries are large and inclining to an oval form; this grape will ripen tolerably out of the stove, if the autumn proves kind, but not before the end of October.

(13.) *Raisin Grape*, hath very large bunches; the berries hang very loosely; they are of an oval form, but will not ripen here without being forced by artificial heat.

(14.) *Aleppo, or Syrian Grape*, the bunches of this grape are the largest yet known, some weighing at least a dozen pounds; the berries are large and white, growing loosely; they are of a good flavour, and their skins being tough can be kept a considerable time after they are ripe; this kind should be constantly kept in the stove.

(15.) *Tokay Grape*, black and white sorts; large and fine bunches and berries: requires protection of glasses, &c. to ripen in perfection.

The above enumerated varieties, which are of the most approved and esteemed sorts, are sufficient to continue against the common walls a succession of ripe fruit, from July or August, till the end of October; or assistance also by forcing, ripe grapes are obtained from May to November, the major part of them being the highest flavoured grapes hitherto known.

To these may be added the following—
Black Burgundy Grape—White Frankendale

Grape—Damascus Grape—Zante Muscat Grape—Rhenish Grape—Provence Grape—St. Peter's Grape, most large bunches and berries; requiring aid of artificial heat.

General Observations.

Vines, although originally natives of distant warm climates, grow freely in this country, in almost any situation and common cultivated soil of our gardens; but it must be observed, they will not produce, or at least ripen their fruit, in any tolerable degree of perfect maturity and good flavour, unless they have the assistance of warm south walls, and their branches regularly trained thereto, in order thereby to obtain all possible benefit of the sun's influence; and even sometimes with that aid, they in unfavourable seasons ripen their fruit in but very indifferent perfection, and not till late in autumn; and some particular large sorts of grapes will not ripen at all in this country, without the protection of glass-houses, aided by artificial heat: however, there are a sufficiency of excellent sorts, which being planted against our common walls, of a south aspect, and well managed, produce fine grapes, when the seasons prove favourably dry and warm; they ripening, in the different sorts, in August, September and October.

All the varieties of the Vine assume the same mode of growth and order of bearing; they in their growth all advance with long slender flexible stems, branches and shoots, sometimes shooting five or six to eight, ten or twelve feet length in one summer; each shoot having many joints, and of a cirrhous-climbing nature, by means of their tendrils or clasps, arising at the joints, which clasping round any adjacent body they encounter, and thereby in some degree elevate and support the shoots in their advancing growth in summer, though not sufficiently in any effectual regular manner; and therefore require a constant regular training, by a general necessary pruning, and nailing every year in summer and winter, and the branches and shoots regularly trained close to the wall: a summer pruning to regulate the shoots of the year, by displacing the improper, and irregular-placed, and superfluous or over-abundant, and to retain and train in all the fruit bearing shoots, and others of proper growth and situation on the Vine, for mother bearers the following year; and a winter-pruning to give a general regulation both among the old branches, and the young wood of last summer, by occasionally pruning out some part of the former, or any unfruitful naked old wood not furnished with young shoots for bearing, as Vines always bear only on the yearling

yearling shoots; and of which in this the winter regulation, pruning out the most irregular and superabundant, and reserving abundance of the strongest and most regular placed in all parts for next summer's bearers, and each shortened less or more as hereafter explained; and then the whole, both old and young branches, to be nailed to the wall in regular order, six or eight to ten or twelve inches asunder, according to situation and strength of the shoots.

As to the order of bearing, and pruning, all the sorts of Vines are exactly similar; always producing the grapes on the young shoots of the same year, arising immediately from the eyes or buds of those produced the year before; seldom immediate bearers from the older wood, but shoots produced therefrom, one year, they in the spring and summer following, when one year old, produce fruitful shoots, yielding fruit the same summer; so that, in Vines, the same individual shoots do not produce immediate fruit from the same eyes the second year, but producing a succession of young shoots one from each eye or bud, and upon these successive shoots, the fruit is produced the same season: and as thus the succession of bearers is invariably continued from year to year, a regular successional supply of the best shoots must be retained every year accordingly; for as Vines always require a regular pruning and training every year in summer and winter, as before intimated, particular attention is requisite in these necessary annual operations to select and reserve a sufficiency of each year's shoots, in all parts of the trees, both for immediate and future bearers, in the order above explained; and at the same time, the useless and superabundant displaced: as likewise, in the winter-pruning particularly, a part of the former bearers and old naked wood must be pruned out to make room for the successional supply of annual young fruit-bearing shoots, advancing regularly from the bottom, one above another upwards to the top or extremity of the Vine every way: all of which retained shoots, in winter pruning, must be shortened or pruned to two, three or four, to five, six or eight joints long, according to their strength, and different situations on the Vine; and then the whole, both young and old wood, to be trained and nailed regularly to the wall, either more or less horizontally or upright, as the allotted space of walling, &c. admits.

The different sorts of Vines are all easily propagated or raised always by layers and cuttings; the laying being performed on the one and two year old shoots and branches,

laid in autumn or spring, five or six inches deep in the earth (see LAYERS), and the tops pruned to two, three, or four joints, they will be well rooted in one summer, to transplant in autumn or spring after, either at once where they are to remain, or some in a nursery for a year or two to grow stronger, then finally transplanted; and cuttings of the young shoots of one year's growth, cut in lengths of two or three joints, planted in the spring, inserted or laid slanting into the ground to the uppermost joint, will emit roots below and shoots above the same year, forming rooted young plants by autumn following; and then the young plants raised by either of these methods will commence bearers in two or three years, especially the layer plants; and also thriving cutting-raised plants will mostly begin bearing the third season.

Vines for final planting against walls, may either be ready-raised young plants of two or three years' growth or more, that have been previously propagated and raised from layers of one or two year's young branches, before intimated, which generally root effectually in one summer for planting off in autumn or spring following; or of plants raised from cuttings of the one year's shoots, which also generally root in one season; and either of which, when of one, two or three years' growth in the nursery, may be transplanted finally, where they are intended, against the proper walls to remain, or may occasionally plant immediate cuttings from the Vine at once in the allotted places, there to strike and always continue, and in which, as they will not have any future removal, to occasion any check in their advancing growth, they will establish their roots firmly, and make very prosperous plants: and thus by the above methods may raise a plantation of Vines, less or more, as may be required; and managed as hereafter advised in their different stages of growth.

But as many persons may be anxious to have their intended walls furnished at once, as it were, with Vines of some advanced growth, to form bearers as soon as possible, ready-raised young plants, of the different varieties, may be obtained at most of the public nurseries of a proper plantable size, of one, two or three years' growth or more, or of eligible advanced growth, for immediate bearing; either in good rooted plants in the full ground, or in pots, which latter being removed in said pots to the places where intended to plant them, may be transplanted from the pots, with the ball of earth about the roots entire, so as to feel but little check by removal; or occasionally the pots with the plants therein

therein placed in the ground, and the pot then carefully cracked or broken not to disturb the ball of earth, and the pieces removed with the same care; and, in either method, filling in the earth closely round the ball.

The season for planting Vines is either in autumn, towards the latter end of October or any time in November, or in the spring, in February, March, or beginning of April.

They may be planted in any light good rich earth of a garden, in common with other wall-trees, in borders under south walls, as aforesaid, or such as incline as much of a southerly aspect as possible.

In planting the Vines in ready raised full rooted plants, if designed for a continued plantation, they may be planted five or six, to eight or ten feet distance; in which, if but low walls, they should be allowed the greater distance; that in default of height, for any considerable upright training, it may admit of arranging the branches more horizontally; but in high walls they can be trained in a more upright direction; or sometimes in wide vacant spaces between wall trees, may plant a Vine in each such space, to be trained upright between the trees; or Vines may be planted against the front or ends of buildings, of a south aspect, open to sun, where having large scope to run or train the branches, they will extend and spread considerably, and produce large quantities of grapes in proportion; and in all of which, those designed to be taken up in the full ground for planting, should be removed with as full roots as possible, and the whole retained, except pruning any casual broken or mangled parts, occasioned in digging them up, or to shorten any very long straggler; and any plants in pots designed for planting, may be planted with the ball of earth about the roots entire, as before suggested; giving the whole, as soon as planted, a moderate watering to settle the earth close about the roots; and then prune the shoots to three, four, or more joints, in length, according to their strength, and nail them to the wall in regular order.

But in planting Vines by unrooted cuttings at once from the trees, in the places where they are always to stand, these, as not having immediate roots, should be planted only a foot asunder, or much closer than the distances above mentioned, for the ready-raised full-rooted plants, that there may be the greater chance, out of the whole, when rooted, and a little advanced in top growth, to make choice of the strongest and most thriving plants for continuance.

As, however, the general methods of rais-

ing the Vines by layers and cuttings, planting and future management, are more fully related below, in their propagation, &c. we refer thereto for further intimations in these particulars.

Vines are also occasionally planted in espaliers, and in vineyard rows, in warm dry sunny-situations; in espaliers they may either be planted, a few of the forward ripening sorts, in assemblage with some other choice espalier trees, or arranged separately: they sometimes in fine warm seasons will ripen grapes in tolerable perfection; and in the vineyard order, to produce large quantities of grapes for making wine, &c. they are planted in some dry warm exposure and light dry soil, or on some gently-sloping situation in the full sun, in rows ten feet asunder, and a range of stakes placed to each row on which to train the branches and shoots; and in which order of planting and training, they, when favourable forward springs, warm summers, and a warm dry autumn, will sometimes produce plenty of grapes in good maturity.

Of their Propagation and Planting.

The general propagation of grape Vines is either by layers or cuttings, as before observed: the method of increase by layers is practised as follows: in autumn or winter make choice of strong prolific shoots, of one or two years growth, arising from near the ground, and of the kind you would wish to propagate; let these shoots be bent down in the earth six or eight inches deep at the part where the last summer's shoot issued from; this should be pegged down to prevent its being disturbed, and then shortened at the top to two or three eyes; the next autumn following the layers will be sufficiently furnished with roots for transplantation, when they may be cut from the parent plant, and placed where intended to remain: but to insure the layer's success by such removal, the laying is occasionally performed either by bending the layer down into a large pot and earthed up, or trained through the hole at the bottom of the pot or pots, one layer in each; in these they take root, and in the winter, if they are separated from the mother plant, they may be turned out of the pot undisturbed, and planted with the roots entire, where it may be thought proper.

But to increase this plant by cuttings of the one year's shoots taken off any time from the fall of the leaf till spring; in the choice of which those of a strong vigorous growth, with the buds not far distant from each other, should be preferred, observing also to choose such as have thick, turgid, blunt buds, as these are most prolific, avoiding those which

are not well ripened, or have their buds pointed. In taking off such cuttings, it is proper where conveniently practicable, to cut them an inch or two in the former year's wood, below the place where the last year's shoot is produced from; for at this joint the roots will more readily spring out and form the plant. Shortening the cuttings, in lengths of three, four, or five eyes, according to their distance from each other: observing, the cuttings may be taken from the parent plant any time between November and February, and planted, or may be laid with their lower part in the ground, and covered in hard weather with litter, where they may remain till the spring season of planting arrives, which is March or the beginning of April; they should then be taken up, cleansed and planted where they are intended to remain, and perfect themselves, as they are not to be removed again, whether for walls or vineyard.

The proper situation for Vines is a south aspect, as full to the sun as possible; for in this country they require every beneficial assistance thereof to forward the growth of the fruit and ripen it in some tolerable degree of perfection and flavour; which cannot be effected in any other than a good southerly exposure, against a south wall, or occasionally in the vineyard, of a similar aspect, trained to a treillage, &c. therefore, in our intention to plant Vines, should always allot them some best southerly walls, &c. or such as incline the most fully to that exposure; observing also the same when designed to plant any in the vineyard manner, in the open ground, in detached rows, trained to stakes, &c. for which the south side of some gently rising ground would be eligible.

With respect to soil for the Vines, this should be attended to with some consideration: if the ground is of a wet nature, or a strong stiff clay, it is the most improper for these plants, as the cuttings or layers will grow very luxuriant, but will produce very ill-flavoured grapes, owing to the redundancy of moisture with which the plants are saturated; a rich light soil is therefore to be preferred; for, notwithstanding the notion of many gardeners, in putting a stratum of stones, brick, rubbish, &c. to impoverish the soil, with a view to render the Vines more prolific, or particularly, by having thereby a dry warm bottom, to forward the growth, ripening, and improve the flavour of the grapes, it, although in some degree may have the desired effect, is sometimes apt to stunt the growth of the plants, and cause the fruit to be small and trifling, whereas, if they have a rich dry soil, the shoots

will grow strong, especially where they can have extent to run, and the bunches will be proportionably large and handsome.

The ground being ready for the reception of the Vines, either in ready raised full rooted young plants from a nursery, &c. plant them against the south wall, five or six to eight or ten feet distance: or if cuttings, let them be planted against the wall, at about six inches asunder, and at such a depth as but one eye of the cutting may appear above ground, observing to press the ground tight about them, and if the season proves dry, let them occasionally have a little water.

But to strike cuttings of Vines as expeditiously as possible, well rooted, and in some advanced top growth for final planting against walls, as above, recourse may be had to the assistance of a stove; therefore where there is the convenience of a stove, in February the cuttings may be planted each in a middling pot, and plunged in the bark-bed; here they will quickly take root, and in the course of the summer make a very great progress, so much as to gain a year of those planted in the common ground, observing, as the pots are filled with roots, to shift the plants with balls into others of a size larger, and this should not be omitted when occasionally necessary; the plants thus forwarded should in autumn be inured to the open air, and turned out of the pots with their balls into the places where they are intended to remain.

With respect to the aspect these plants require, let it be always remembered, that all aspects are improper for grape Vines; excepting the south and south-west, as in other situations scarcely any bunches will ripen in this cloudy changeable climate.

General Management after planting.

When the cuttings, &c. begin to shoot, let them be examined, and leave only two of the best shoots of the year, if so many arise, those which appear the strongest should be chosen; about a month after, the shoots will have made some progress, so as to show which is likely to be the strongest; this shoot should be preserved, carefully nailing it against the wall, to prevent its being broke by the wind, observing to rub off the other; in the course of the summer, as the shoot advances, continue to keep it nailed up, and let all lateral shoots be stripped off as they are produced; this, with keeping the ground clear from weeds, and occasionally watering in dry weather, is all that the plants require in their summer's management; and in autumn, when the leaves turn yellow and begin to drop, the shoot which has been reserved should be topped down to two eyes; and

and these will produce shoots the succeeding summer.

The spring following, the borders may be enriched and dug up, so as not to disturb the roots of the Vines: in April and May the shoots now produced from the eyes which were left will be of a considerable length, each should be tacked to the wall to prevent their being broke by the winds, rubbing off all lateral shoots as they are produced, and this work should be repeated occasionally, till the shoots have done growing, observing to keep the ground entirely free from weeds during the summer. The November following, the operation of pruning should be performed by shortening the weakest of the shoots to two or three eyes, and letting the strongest be left to four, six or eight eyes, according to its strength; for if the principal shoot is very strong, the greater length should it be cut to, and the more probability there is of its producing fruit the succeeding summer.

The same care will be required the third year, &c. for in April or May, according to the forwardness of the season, the shoots of the Vines will have made some progress, which should be properly attended to; this is by displacing all unnecessary shoots, leaving none but those which have the appearance of producing bunches, or furnishing shoots for the succeeding year; these should be laid close to the wall in a regular manner; for, if neglected, the first violent wind may break them off, and if not, the shoots will soon run into confusion; the omission of this necessary work will also be attended with other bad consequences, for the growth of the bunches will be retarded, and the shoots, intended for the supply of the next year, will be so much shadowed and stopped in their growth as to prevent the wood from obtaining its proper ripeness, so as to be able to furnish good fruitful shoots in future. The same attention should be paid the Vines in the following months, observing to keep them nailed up as they advance, displacing all useless, straggling and lateral shoots. As they are produced in August, the extremities of the fruit-bearing branches may be shortened, as also those which have run out of bounds to a very great length; this stopping the shoots will assist the bunches to swell their berries out, and forward their ripening; and if that or the former month proves very dry and hot, let them be moderately watered: this will keep the Vine in a ductile state, and be a great addition towards increasing the size of the bunches; but when the fruit is full grown, watering should be disused, as it would de-

bate the flavour of the berries. When the grapes are approaching to ripeness, they should be guarded from the ravages of birds, wasps, and other insects: they may be protected from birds, by placing a net over the Vine; but this prevents not the wasps, &c. from preying on the fruit; therefore, to hinder these insects from making their depredations, provide some fine crape, which being cut to a proper size, bags may be made so as to fit the principal bunches: black crape is best, as it is of a colour which absorbs the rays of light, and assists, by its warmth, the ripening of the bunches. But as our climate will not sufficiently ripen the finer sorts of grapes, I shall concisely mention the method of obtaining them in perfection, and for fuller particulars refer to the articles, *FORCING HOUSES*, *STOVES*, &c.

Forcing Grape Vines.

Various buildings have been contrived to effect the ripening of those kind of grapes, which cannot be effected in the open ground, as likewise for the earlier sorts to be fit for the table in May, June, or July. The construction of these kinds of buildings are different, though all answering the same purpose: some are constructed with flues ranging within the wall where the Vines are trained up; but as the Vines would receive more heat at times by being closer to the wall than is proper, a lattice work is generally detached therefrom, to which the branches are trained, and the whole is covered with a range of sloping glass; but the more common method is to train them under the sloping glasses of the pine-apple stove, the Vines are generally planted close on the outside, and trained in through holes contrived for the purpose; in such places there is a certainty of the grapes ripening in perfection, observing occasionally to train fresh shoots from without in autumn or winter, that there may be no want in the choice of wood; their management differs but little from those of the common walls, therefore needs no repetition.

The other species of Vines are those which more excite curiosity than are of real use.

2. *VITIS Labrusca.*

Ivy-leaved American Vine.] Hath a climbing stalk, furnished with large, trilobate, heart-shaped leaves, downy on their underside and indented on their edges; the flowers are produced in bunches, and are succeeded by round rough flavoured black fruit.

3. *VITIS vulpina.*

Fox-scented Virginia Grape.] The leaves are large and smooth on both sides, of a heart-shaped figure with indented edges; the flowers grow

grow in bunches, and are succeeded by black berries of a very disagreeable stinking flavour.

4. *VITIS laciniosa*.

Lacinated, or Cut, Parsley-leaved Canada Vine.] The leaves of this sort are finely divided; the stem is thick, bearing strong shoots; but the fruit is of no account.

5. *VITIS arborea*.

Tree, Pinnated-leaved Carolina Vine.] The stem more erect, but the shoots rather weak; is admired for the beauty of its leaves, which are supradecomposed, of a fine green colour, and composed of a multitude of delicate folioles; the flowers come out in bunches from the wings of the stalks, and are succeeded by berries of the size and form of pepper.

All these species are propagated by cuttings, layers, or suckers.

Tender Kinds for the Hot-house.

6. *VITIS indica*.

Indian Villose-leaved Vine.] Heart-shaped, indented leaves, villous-hairy underneath; and racemous tendrils.

7. *VITIS trifoliata*.

Three-leaved Indian Vine.] Trifoliate leaves, with roundish folioles.

These two Indian Vines are preserved in some curious stove collections for variety; and are propagated by seed, and by layers and cuttings vegetated in a hot-bed, or the bark-bed in the stove; and managed as other woody exotics of that department.

VOLKAMERIA.

Volkameria.

A genus, furnishing, for the stove, two exotic trees from the Indies, of moderate growth, garnished with oblong-oval and oval leaves; and monopetalous, ringent, irregular flowers, succeeded by roundish berries.

Class and order, *Didynamia Angiospermia*.

Characters.] **CALYX**, monophyllous, turbinate, with the border five-parted. **COROLLA**, monopetalous, ringent, with a cylindric tube double the length of the calyx, divided in the border into five sub-equal segments. **STAMINA**, two very long and two shorter filaments, and simple antheræ. **PISTILLUM**, a four-cornered germen, slender style, with a bifid stigma. **PERICARPIMUM**, a roundish four-furrowed, bilocular bacca, with a single nut in each loculus.

The species are,

1. *VOLKAMERIA aculeata*.

Prickly Jamaica Volkameria.] Rises with a woody stem and diffused slender branches, fifteen feet high or more, garnished with oblong-oval-lanceolate shining leaves; spines at the rudiments of the petioles; and umbels of flowers at the sides of the branches.

2. *VOLKAMERIA inermis*.

Unarmed or Smooth Indian Volkameria.] Rises with a shrubby stem, and upright white branches, without spines, several feet high; garnished with oval leaves, in whorls; and flowers on long peduncles, standing erect.

Both these species require the protection of a stove, especially in winter; in which a plant or two of each will form an agreeable variety.

They are propagated by cuttings in May or June, planted in pots plunged in a moderate hot-bed, in which they will soon emit roots below and shoot at top; and should then, when a little advanced in growth, be transplanted into separate pots; and plunged again in a hot-bed or bark-bed to assist their fresh rooting, and forward them in growth before the approach of winter, when they should be placed on the stove; and have the general culture of similar woody plants of the stove collection.

VOLUBILIS caulis.

A twining or winding-climbing stem.

Volubilate stems are such as ascend spirally round the stem or branches of other plants, or round one another, or round stakes, or any thing similar they meet with in the course of their extending growth; exemplified in honey-suckle, hops, runner kidney beans, &c.

These stems in different sorts of plants wind in different directions either to the left, according to the apparent diurnal motion of the sun, as in honeysuckle, hop, and black bryony; or to the right, as in kidney-bean, convolvulus, and Malabar night-shade.

As many of our garden plants, both hardy and tender kinds and woody and herbaceous, are volubilate climbers, some mounting spirally upon support several feet high; they should all be allowed proper support accordingly, of stakes, or poles, &c. proportioned to their extent of growth; and some of the hardy kinds, extensive growers, may be placed to twine round the branches of trees and shrubs, &c.

W.

W A L

W A L

WACKENDORFIA. (*Wackendorfia*.) This genus consists of two African flowery perennials for the green-house, with thick, tuberous, fibrated, red roots, sending up spear-shaped, channeled, plaited leaves, from half a foot to two feet long, by two or three inches broad, and amidst them, upright flower-stems, three or four feet high in the first sort; the other about a foot, producing hexapetalous triandrous flowers, terminating the top in a thyrse and panicles; having spathaceous, bivalve calyxes, a corolla of six oblong petals, three standing erect, and three spreading; with three spreading stamina; a roundish triangular germen, and declining style; succeeded by an oval-triangular, trilocular capsule, with three seeds.

Class and order, *Triandria Monogynia*.

The species are,

1. *WACKENDORFIA thyrsiflora*.

Thyrse-flowering Wackendorfia.] Large, long, spear-shaped leaves, five-nerved and channelled: and tall single stems, terminated by a thyrse spike of yellow flowers.

2. *WACKENDORFIA paniculata*.

Panicle-flowering Wackendorfia.] Shorter sword-spear-shaped trinervous leaves, and short dividing flower stalks, producing panicle-spikes of purple flowers.

3. *WACKENDORFIA umbellata*.

Umbel-flowering Wackendorfia.] Flowers produced in umbels; the umbels two-parted.

These are desirable ornamental flowering plants, very deserving of admittance in the green-house collection: they being tender, require protection in winter; keep them in pots of light, sandy, loamy mould, and give them the common culture of other herbaceous exotics of similar temperature; they will shoot up flower-stalks annually in the spring, and flower very agreeably in July and August, and are propagated by off-sets, root-suckers, and by seed.

WALKS.

Garden Walks may be considered as both of the useful and ornamental kind; in all gardens Walks are necessary and useful, both for communication with the different districts and compartments, and for dividing the ground into proper divisions in any particular order

required, as well as for occasional pleasurable walking for health and recreation; and ornamental Walks in a pleasure ground, generally more spacious than the common necessary Walks of a kitchen garden, are requisite in conformity with the other decorative compartments of that district, both to form variety in the composition of the general plan, and for communication with, and the pleasure of walking through, the various departments to enjoy the prospect of the beauty of their different or varied arrangements, and the diversified growths of their respective plants, trees, shrubs, flowers, and fruits, &c.

Of the generally necessary useful Walks, may be considered all those of the kitchen-garden, requisite both for dividing the ground into regular quarters, borders, &c. and for communication to the different parts of the ground, and from one part to another, as occasion may require; and in which a Walk should generally be continued all round the garden next to the boundary wall, hedge, or other fence, having a wide border ranging immediately close along under the said boundary fence; and the Walk extended close parallel to the border, four or five to eight or ten feet wide according to the general ground; and if this is considerable, one or more cross Walks of similar dimensions will be necessary; or sometimes where a kitchen-garden and pleasure-ground are connected, or both in one, as it were, the principal Walks should be more capacious than in a common kitchen garden, having a handsome border on each side; and sometimes, if this general garden is of some considerable width, a middle Walk is occasionally adopted, extending right through the middle of the ground, bounded on each side also with a spacious border; and which different borders may be allotted both for some small esculent plants, and a variety of flowers, occasionally, as may be thought necessary, in consideration of economy and ornament.

The general Walks of a kitchen garden should commonly be gravel, especially the most common walks in which much occasional wheel-barrow work may be required in the business of bringing in dung, earth, or other requisites, and wheeling out rubbish of the

the garden, &c. on which occasions grass Walks would not be eligible, as they would be much cut and defaced; and liable to be wet, swampy, and very damp in winter, though sometimes grass walks are adopted in some particular parts of a pleasure-kitchen-garden by way of variety, and for occasional soft walking in summer; but gravel, where conveniently attainable, is greatly preferable for the general walks; or sometimes for common Walks in a kitchen-garden, &c. in default of gravel, dry road soil is substituted; that is, the scrapings of gravelly turnpike roads, shovelled up in wet weather, and lying till dry, will make firm dry walks at all seasons.

In a general pleasure-ground the different Walks may be considered principally both as ornamental in appearance, and requisite in diversifying the general plan, as well as necessary for occasional pleasure walking, and for communication with and to the different districts; and should generally, in the principal conspicuous divisions, be more spacious and elegant than the general Walk of a common kitchen-garden, just above considered; may be ten to fifteen feet wide, or more; or grand walks extending immediately parallel to or from the habitation, are sometimes twenty or thirty feet wide: and which general Walks in this garden should be principally of the best gravel for dry and firm walking at all seasons; or in some particular districts may have a spacious grass Walk for occasional summer walking, or some arranged between elegant shrubberies, rows of trees, or in open groves, for shady walking in the above season; also, sometimes sand Walks in shady plantations.

Respecting the mode of arrangement and disposition of Walks in the pleasure-ground, they may be various according to fancy, or conformably to the general plan; either arranged in a varied serpentine way, in gentle windings, as the most characteristic agreeable to modern designs, or extended in straight lines, either in general or in particular districts, correspondent to the general plan of the garden: but in principal gardens, a natural imitation in varied gentle serpentine turns is more generally adopted as the most agreeably pleasing and entertaining; though in limited situations or small gardens, as there may not be proper scope for any particular variation, common straight Walks continued round and across the garden may sometimes be the most conveniently eligible, or occasionally varied from straight to serpentine, to effect the greater variety.

Generally in every pleasure-ground a spa-

cious gravel Walk should range close parallel to the main dwelling, and thence extended in a proper width and direction into the interior of the garden and plantation; or, according to some designs, a grand Walk, gravel or grass, is extended from the above parallel Walk, right forward in front of the principal habitation, either in a straight line, or easy winding direction; bounded on each side either with a border and adjoining lawn, or more agreeably with an elegant shrubbery, or spacious borders of flowers and curious shrubs: in other plans is led off to the right and left round the outward boundary of a noble lawn, in front of a spacious bank or border of flowers, or shrubbery plantation, either generally in a moderate serpentine order, or straight as the general plan of the ground may admit; or also conducted toward, and into some side or boundary shrubbery, for shady, sheltered and private walking; and carried on gently winding in an easy natural manner, through the extent of the plantation, either in continuation round the general garden, or that of a connected plantation, extending to a park, &c. and with other similar Walks within the limits of the general pleasure-ground, branching off at proper intervals variedly, to other different districts internally; some under the shade of groves, thickets, or shrubberies; others in more open and airy compartments, between spacious grass divisions and detached shrubbery clumps, gently winding in a varied direction, so as to enjoy the pleasure of agreeable prospects in the different arrangements of shrubberies, groves, flower-borders, grass-lawns, water, &c. and in the various growths of the different sorts of trees, shrubs and flowers in their several allotted compartments; and thus the Walks of a general pleasure-ground may be led in various arrangements and dispositions, according to the extent and order of the general plan, either conformably to the more modern natural imitation, or in the ancient style in straight lines.

The general gravel Walks in a pleasure-ground should be formed of the best sort of the middling-sized gravel, not too fine nor roughly large, and such as will bind well, and remain firm and dry in all weathers and seasons of the year; and of the best colour, according to what different places afford, which in some places is high coloured, in abounding with a natural mixture of yellowish, reddish or brownish-yellow, light sandy loam, which not only heightens the colour of the Walks, but proves of a binding nature, fixing the pebbles of the gravel firmly and even, for easy

and agreeable walking; in other places the gravel is sometimes destitute of any binding material, consisting wholly of loose pebbles which never bind firmly in the Walk, but remain scatteringly loose on the surface, uneasy to walk upon; and which kind of gravel should generally be blended with some sort of binding sand, or a portion of light dry sandy loam, where attainable, so as, when formed into a Walk, to render it more fixedly binding, with a firm even surface.

Preparatory to the formation of gravel Walks, the earth of the allotted spaces should be excavated six or eight inches depth or more, to admit of a proportionable depth of gravel; and previous to laying the gravel, the boundary edge of the Walk should be formed regular, either where bound with an adjoining grass lawn, plats, or other grass compartments, by cutting the edges thereof even accordingly; or some occasionally planted with edgings of box or thrift, or sometimes with narrow verges of grass, as may be convenient or thought eligible in different situations, conformable to the plan of the garden; the gravel should then be laid; or, where convenient, may previously lay some rough dry rubble in the bottom two or three inches thick, which will keep the Walk drier above, laying the gravel upon this the proper thickness, with the surface gradually rounding, treading it down evenly, rake it smooth, and give a good rolling across and long ways, with a heavy iron or stone roller. See GRAVEL WALKS.

Where grass Walks are intended, they should generally be of some tolerably spacious width, not in narrow trifling slips, but at least ten or twelve feet wide, or double that, or more, in large pleasure-grounds: and as to their proper situation this may be varied, either sometimes near the habitation, or some more internally distant; accommodating it to their general purposes, as being principally for summer walking in dry weather; and occasionally also for ornament; and may either be arranged, some in straight lines, or others moderately serpentine on the sides, or the whole gently winding, and generally bounded either with noble broad borders of flowers, or with a handsome sloping shrubbery, or some extended between rows of ornamental trees, either distinct or in groves, &c. and in their formation they may either be laid with grass turf (see TURF), especially in Walks of moderate extent, or where too considerably extensive for turving, the sward may be formed by sowing grass seed in spring, summer, or autumn, which will quickly come up, and soon

form a close green sward; observing, previous to either method, the ground should be properly prepared, by necessary levelling, treading and raking, &c. forming the surface firm and even; then either lay turf, beating it well down to form a close smooth surface, or sow grass seed of a proper clean sort, sowing it considerably thick and regularly in every part; then rake it evenly into the ground, and afterwards, when the surface is quite dry, roll it regularly with a moderate roller, to smooth the surface and close the earth more effectually over the seed. See GRASS.

Sand Walks are sometimes introduced in pleasure-grounds, in particular districts, and occasionally under shady plantations, and for wood Walks, &c. in thickets, and as in which situation, either sand or gravel Walks are apt to be over-run with moss, the sand Walks can be more easily and expeditiously scuffle-hoed over than gravel, to destroy the moss, and then raked clean and even; or sometimes where sand Walks are over-run with a short, green, carpet moss, they are permitted to remain in that state, both to effect a more rural variety, and for soft walking to the feet under shade, in the heat of summer; observing, however, where sand Walks are intended, should procure sand of a dry, solid, binding nature, not a loose quick sand, which would never bind firm for solid walking; and in forming the Walks, observe nearly the same method as for those of gravel.

With respect to the general management of Walks—

Those of gravel should be kept always neatly clean by occasional weeding and sweeping; and frequent rolling with an iron or stone roller, once or twice a week in summer, or sometimes oftener when the surface appears loose and disorderly, occasioned either in very dry weather, or after much rain, when should generally give a good rolling to settle all inequalities, and render the surface smooth and firm; giving also occasional rolling in dry open weather in winter and spring: and when the surface is become foul, or mossy, or full of small weeds, the gravel should be turned in the spring in March or April, by digging up the Walk a small depth, turning the surface clean down, and the fresh bottom gravel to the top, treading, raking, and rolling it directly, and will then have a fresh clean surface for the spring and summer. See GRAVEL WALKS.

And grass Walks should have the sward always kept close and even by frequent mowing, sweeping and rolling in spring and summer,

mer, from March or April until October or November; and in winter occasional poling and rolling are necessary in dry open weather; poling with a long pliant pole to scatter the worm-cast earth, and then rolled with a wooden or other roller to clean up the scattered earth by adhering thereto, thereby both cleans the surface, and settles the sward close, firm, and smooth. See GRASS.

WALLS.

Garden Walls.

Walls in gardens are of great utility, especially in some particular districts, such principally as that of the kitchen-garden, or where the kitchen and pleasure-ground are all within the same general boundary, and in other districts occasionally; serving both as an outward fence against the invasion and depredations of interlopers, and as a defence or shelter against cold cutting blasts, and tempestuous winds; and of great importance for the advantage of having Wall-fruit-trees trained thereto, whereby to obtain the production of their respective fruits in the most early and improved state of maturity in the fullest degree of perfection.

But, for Wall-trees, garden Walls are of particular utility, especially as many of our tenderer sorts of fruit-trees, without having the aid of being trained to warm Walls, would not produce fruit in mature ripeness in this country; such particularly as peaches, nectarines, apricots, vines, figs, &c. all which generally require a situation against the best southerly Walls, &c. and to which have their branches trained close in a regular expansion, in order to receive the full advantage of the warm shelter thereof, from cutting cold in the spring when in early blossom, and the young fruit setting, as well as to enjoy the essentially necessary benefit of the full sun in spring, summer, and autumn, to forward and improve the growth of the said fruit, in the different sorts, in the most effectual manner and requisite degree of perfection, as to attain perfect maturity of ripeness in the proper season, and with their peculiar richness of flavour.

Likewise it may be observed, that, by the aid of Walls, many or all of our common hardy fruit-trees, although they bear fruit abundantly in good maturity upon common detached standards, are productive of their respective fruits, both earlier and in some superior degree of perfection in size, beauty, and goodness of flavour; and where any principal sorts are trained against south, or south-west, and east Walls, the fruit ripens in the most early maturity, and generally, both in the early and later kinds, acquire a still more

improved state of full perfection and good flavour, some for immediate eating, others for keeping a shorter or longer time; as in the principal varieties of cherries, choicer sorts of plums, and the capital varieties of the finest eating pears, both summer, autumn, and winter kinds; as likewise some estimable sorts of the best eating summer and autumn apples, &c. and in all of which sorts of hardier fruit-trees, some being planted against full south Walls, produce the earliest and best flavoured fruit, and others planted on Walls of west and easterly aspects, and on north Walls, are productive of fruit in successional and late maturity.

So that garden Walls, besides their utility as boundary fences, are of particular advantage in affording the opportunity of planting and training Wall-trees of the choicest varieties of the respective species, for obtaining the fruit in superior perfection; and for the further advantage thereof, sometimes in places where there is eligible scope of ground on the outside of the boundary Walls, to admit of having an outward slip of ground, fifteen to twenty or thirty feet width or more, inclosed with an outer paling fence, or an hedge and ditch, both sides of the Walls are furnished with Wall-trees; likewise in gardens of some considerable extent, internal cross-Walls are also sometimes erected principally for Wall-trees, whereby to have a larger collection of the best varieties of the different sorts planted on both sides of the said Walls; as in the several different sorts usually trained in Wall-trees, they may be suited to different aspects in the tenderer and common hardy kinds, by planting some on south Walls, others on west and east aspects, and some on north Walls; however, observing generally, that either in single boundary Walls, which are considerably the most general, or in such as, by means of an outside inclosed slip, admit of planting on both sides, or also in cross Walls, should allot those of south aspects for the choicest sorts of fruit, both of tenderer and hardy kinds, such as peaches, nectarines, apricots, vines, figs, of the former; and of the latter, some best cherries, plums and pears; and others of all the sorts may be planted on west and east aspects; and some sorts, of the latter, also on north Walls, especially some summer pears to ripen later in succession, likewise plums and morello cherries, for the same occasions. See WALL-TREES.

Respecting the proper sorts of garden Walls, they may either be brick, as the most desirable for Wall-trees, or of stone, according as these materials can be the most conveniently obtained in different places; or in de-

default of brick or stone Walls both as fences and for Wall-trees, close strongpaling of wood, six to seven or eight feet high, may be substituted; but where Wall-trees are a principal object, brick Walls are much preferable to those of stone, especially as the mortar-joints of the brick-work, being at small and equal regular distances, affords the greater advantage, in training the branches of the trees more effectually in proper regularity, by means of having the continued opportunity of nailing into the said joints at any distances or lengths, as may be necessary, or also occasionally into the bricks, where not of the very hard-burned kinds; especially by having proper Wall-nails, short and robust, which will generally admit of driving into most sorts of common bricks; and which advantages are not so attainable in stone Walls, in which the joints are not generally either so frequent or so regularly distant to admit of nailing the branches with equal regularity, as above; however, as in many places stone Walls may be more conveniently attainable than brick, in regard to the acquirement of the material stone for their erection, and in which case where designed to have Wall-trees, it would be advisable to have the Walls faced with moderate sized stones, as regular in form, and equal as possible, for the greater opportunity of the mortar-joints occurring at small distances, to admit of nailing the branches in regular order.

In regard to dimensions in height, &c. for garden Walls, they should not be less than eight or ten feet high, both as a general outward fence, and for the advantage of having Wall-trees, and for which latter occasion, any intended internal cross Walls should be nearly the same height, or not less than eight feet; and in general about fourteen inches, or a brick and half thick in brick-work; though sometimes brick Walls of lower dimensions are only nine inches or one brick length thick, above ground, but in exposed situations should not be less than a brick and half, otherwise would be liable to be overturned by impetuous winds; and stone Walls should generally be thicker than those of brick, as they have not the advantage of the general regular tie or bond, as in brick-work Walls.

Or, as before intimated, where there are any good close-boarded palings, they may also be eligibly used, against which to plant and train Wall-trees; being of proper height, six or eight feet, and the pales or boarding closely joined, and with an even surface, to admit of training the branches close and regular; and on which may occasionally have any sorts of

Wall-trees, and the fruit will ripen in good perfection, though probably not quite so soon in their respective seasons, as those against brick-Walls, which are generally of a warmer nature, for accelerating and improving the growth of the fruit.

Concerning the position of arrangement of Walls, where Wall-trees are intended,—if the situation is not particularly limited, and there is scope for choice, they should generally, in the principal Walls, range east and west, and the others north and south, or both as nearly in those directions as possible, for the advantage of having the greater benefit of the sun; and in which it would be eligible to have the principal Walls, or such as range east and west, of greater extent than the others, where the situation admits, in order to obtain the advantage of having a more considerable extension of a south aspect, for the trees of the choicer sorts of fruit, and such as will not ripen freely without being trained to Walls of that exposure, consisting of peaches, nectarines, apricots, grapes, and figs, as formerly intimated; and likewise for many varieties of the principal sorts of our hardy fruits, particularly some of the superior varieties of cherries, prime sorts of plums, and fine eating pears; both of the summer and autumn kinds for present eating; and some choicest winter pears, to attain greater perfection in growth and flavour, to gather for keeping till winter, also for some early currants and gooseberries: and the north and south ranging Walls, of east and west aspects, are eligible against which to have trees of many varieties of the above sorts of fruit in a secondary order; some to ripen in succession for autumn supply, and others, as some best sorts of late autumn and good winter pears, to lay up in the fruitery for attaining successional maturity in the winter season, from November and December, till March, April, or May, in different varieties; and the Walls of a north aspect serve for Wall-trees of several sorts of common hardy summer and autumn eating fruit, to ripen in later succession, as cherries, plums, and pears; and for any of the large hard pears that are proper principally for baking and stewing, &c. likewise for late currants, &c. See a list of the different sorts of fruit, times of ripening, and methods of planting and managing the trees as above, in the Wall-tree order, under their respective genera. See also WALL-TREES.

In building garden Walls, those designed for Wall-trees should generally be built quite straight, not in sweeps or curves as sometimes practised, on a supposition of affording greater shelter to some principal sorts of trees planted therein,

therein, but have not the desired effect of the intention, in regard to protecting the blossom and young fruit; for there is generally a particular current of sharp cutting air, circulating in those curvatures or bendings, more hurtful to the early bloom, &c. than occurs on straight Walls; it is therefore always advisable to range the Walls wholly straight or in one continued regular extent, according as the situation may admit, and in which the Wall-trees will generally be the most successful in their production of plentiful crops of fruit.

In some places the surrounding boundary Wall of a garden has been built in a continued circular order, with design that the Wall-trees trained thereto might all equally enjoy the benefit of the sun gradually in its diurnal course; but this kind of Wall often attracting a whirling circumvolution of cold air, not occurring in straight Walls, and which in spring being generally more unpropitious to the early blossom and young fruit of the tenderer kinds, than usually happens to those on common Walls ranging straight east and west, north and south, or nearly in those directions as before observed, and therefore is not commonly adopted.

Sometimes in stone garden Walls for Wall-trees, when the facing of the Walls is very irregular in the stone-work, so as not to admit of nailing the branches of the trees in any tolerable regularity, a light treillis of wood-work is erected close to the Walls, in uprights, and cross horizontal railing, the latter about six inches asunder, on which to arrange and nail the branches in the requisite regular order. See TREILLAGE.

WALL TREES.

Wall-trees, being such fruit-trees as are planted close against walls, and have their branches trained thereto into a fanned regular expansion, three or four to five or six inches asunder, whereby to produce their respective fruits in a superior degree of perfection, are designed both for trees of the more tender kinds, or such as will not ripen their fruits in this country unless they are trained against walls of a southerly aspect, to have every possible beneficial advantage of enjoying the full sun; and likewise for several sorts of the common hardier kinds in the most esteemed principal varieties, &c. thereof, both to obtain their production of fruits in earlier maturity, and in general of an improved growth and goodness of flavour.

On these considerations, a collection of the choicest varieties of the different sorts of fruit trees are trained to walls of different aspects; south walls for the principal sorts of the more

delicate or tenderer fruits, comprising peaches, nectarines, apricots, grapes and figs, to have the benefit of the full sun, as they will not ripen in good perfection without the assistance of having their respective trees trained against warm walls, of the most sunny aspects; and likewise against similar walls to have some best varieties of the principal sorts of the hardier fruit-trees, such as the most esteemed cherries, plums, and pears, both to produce earliest fruits, and in the greatest perfection of full growth and maturity; also some trees of the choicer sorts of summer and autumn apples, to have the fruit of earlier maturity and improved rich flavour for immediate eating; likewise some best red and white currants and gooseberries: and on west and east walls to have trees of most of the above sorts, which will also ripen in good perfection successionally to those on the south walls, especially cherries, plums, and pears, and occasionally some common peaches, nectarines and apricots; but vines and figs most generally on south walls, especially vines, which require all possible benefit of the full sun to ripen the grapes in proper season, and with a rich flavour: the north walls are eligible for any of the common hardier summer and autumn fruits, as cherries, particularly morellos, plums, and pears, for late ripening, to succeed those of the more sunny exposures, and to continue a longer succession of some particular sorts of these kinds, which ripen for immediate eating from the trees: also white and red currants for successional ripening in autumn, from August to September, October, or November.

Thus, the principal utility of Wall-trees is to obtain a collection of the choicest fruits in the fullest perfection, both in early and successional maturity, and are indispensably necessary for all the tenderer fruits before mentioned, and which to be generally trained on walls of the most sunny aspects, to have them ripen in full perfection; and in the common hardier fruits, which also ripen abundantly on standards for the general supply, such as pears, plums, cherries, &c. by having some principal sorts trained in wall-trees, the fruit is obtained earlier and in a superior degree of maturity in its general growth, and generally with some improved flavour, more or less, according to the different aspects of the walls, in having the benefit of the sun in a greater or less degree.

Wall-trees having the advantage of their branches being kept thin in regular order, and trained in a spreading expansion, close to the wall, at regular distances, so as both to have the benefit of the warm shelter of the walls from

from cold when in blossom, and fruiting, and all equally to enjoy the continued benefit of the sun and mild air to forward and improve the growth of the fruit, which is thereby produced earlier, and in some considerable degree of superior perfection than on standards, whose branches being commonly permitted to grow in their natural order, often crowded and very irregular, and being more openly exposed to all weathers, they, although productive of more abundant crops of fruit in common good maturity, in the general hardy sorts as pears, plums, cherries, apples, &c. do not generally produce fruit equal in size, or regularity of full growth, early perfection, and goodness of flavour, as the same sorts produced on Wall-trees: and therefore it is of importance to allot a chosen collection of the finest varieties for training against walls, not only the tender fruits which will not ripen without that assistance, but also the most estimable varieties of all the different hardy kinds, to obtain the fruit in the fullest degree of perfection as above, especially of all the prime eating or dessert table fruits.

The principal species of fruit-trees commonly trained against walls are peaches, nectarines, apricots, vines and figs: all the varieties of each of these sorts, and which most generally is allotted to walls of a south aspect: cherries, plums, and pears, some of the best varieties only, of each of these kinds, both on south walls for earliest production, and on other aspects for successional ripening; also occasionally some best varieties of early and other prime-eating apples, such as Jenneting or June-eating, Margaret apple, golden pip-pin, golden rennet, &c. on south or west walls, and sometimes mulberries on south walls to obtain larger and earlier fruit, ripening with a richer flavour; and generally some best red and white currants, and a few trees of the finest early gooseberries; but more abundantly of the currants, some on south walls, for earliest fruit, and a larger supply on other exposures to ripen fruit in successional order.

Wall-trees may be considered as consisting of two orders; common dwarf wall-trees, and half-standard wall-trees.

The common dwarf Wall-trees are such as are trained with dwarf or short stems, only a few inches high, and branch out near the ground, so as to cover the wall with branches regularly quite from the bottom upwards to the top, arranged horizontally three or four to five or six inches asunder, and are the common Wall-trees for general planting against walls, of all the different sorts usually trained in the Wall-tree order; and for which occasion those commonly raised by grafting and

budding are grafted or budded low in the stock or stem, within four or five inches of the ground, and the first main shoots arising immediately from the inserted graft or bud, are, when a year old, headed or cut down in the spring to four or five eyes, to obtain a production of lateral shoots the same year, from these said remaining lower eyes or buds, near the ground, to give the tree its first proper formation in the head, being trained to the wall in a spreading order to the right and left, at their full length all summer; and in the following spring, in March, are pruned each to six or eight eyes, to gain a further supply of laterals similarly, by which to increase the number of branches near the bottom, trained to the wall horizontally, in a regular expansion, equally on both sides of the tree, which form a proper foundation, as it were, in the advancing head, for furnishing, by degrees, all the other requisite branches, regularly upward to the top of the wall; observing also the same of such trees as are commonly propagated or raised by layers, cuttings, and suckers, as in vines and figs, &c. and afterwards, the whole to be managed as directed for each different sort under its respective genus.

Half-standard Wall-trees are trained with standard stems, three or four to five or six feet high, being grafted or budded at these heights to branch out above accordingly; and are adopted occasionally to plant against high walls, between the common dwarf Wall-trees, in order to have the whole wall, below and above, covered as soon as possible; the common dwarf trees advancing below whilst the half-standards occupy the upper parts, they having their first and second year's shoots from the budding and grafting pruned as intimated above in the formation of the common Wall-trees, to acquire a supply of lateral shoots near the top of the stem, properly situated to train for the first set of branches in the formation of the head; arranging them to the wall, in a spreading order, horizontally, at regular distances; and they will thus furnish others in their turn, and these a further supply similarly, forming by degrees a full head; managing the whole according to the nature of growth and order of bearing of the different sorts, as explained under their respective genera. See also STANDARD TREES and TRAINED TREES.

Young plantable Wall-trees may either be those with one-year-old heads from budding or grafting, &c. planted at once where they are always to stand, and trained as above, by heading the first main-shoots which were produced immediately from the inserted bud or graft the year before, to obtain laterals below; and

and these also pruned in the order above mentioned, thereby to gain a further supply, and afterwards managed as before mentioned; or may be ready-trained young trees of three or four years' growth or more, furnished with spreading heads or branches, having been previously trained in the nursery to walls or other fences, flakes, &c. in a similar manner, two, three, or four years, or more, till advanced to a proper growth for immediate bearing; as is practised in all the public nurseries, for the supply of those who are desirous of having their walls furnished with immediate bearing trees; (see TRAINED TREES) and in which nurseries, are great choice of all the different species and varieties of the fruit-tree kind for walls, both in young trees with one year old, untrained heads, proper for planting finally where they are to remain, and there trained from the beginning in the order required, either as common dwarf Wall-trees, or half-standards, and all of which, with proper management, will arrive to bearing, in from two or three to four or five years, according to the different sorts; and likewise in the same places may be furnished with ready-trained trees, above mentioned, of all the different sorts, arrived to a proper growth for immediate bearing in the ensuing season.

The season for planting Wall-trees is either in autumn, in October, or November, &c. or in spring, February and March, or not later than the beginning of April, but before that time, if possible; as late spring-planting, after the young trees begin to push their shoot-buds, is often attended with ill success, by the trees, either in some, wholly retarded, or others, assuming a stunted unprosperous growth.

With respect to soil for Wall-trees, they will succeed in any good mellow garden earth, not less than one full spade deep; but if two or more, it will be the more advantageous: or where a good moderately light loamy soil occurs, it is superiorly favourable for most sorts of fruit-trees, promotive of a prosperous growth and fine fruit. Or where the soil of the borders under the walls intended for the Wall-trees is very poor or of any bad quality, and requires amendment, if this could be conveniently supplied with fine rich surface loam, and some rotten dung, it would be of beneficial advantage in the prosperity of the trees, and their production of fruit of a superior perfection. See BORDERS, KITCHEN-GARDEN, &c.

And in regard to aspects of the different walls on which to plant the several sorts of trees, always allot south aspects for the

peaches, nectarines, apricots, vines and figs, as before noticed; and some part also of the same exposure for a choicer assortment of the early and other principal cherries, plums, and some finest-eating pears; and on west and east walls are proper for any varieties of all the three last mentioned species, likewise for some of the common peaches, nectarines, and apricots; and on north walls may allot for any of the sorts of cherries, plums, summer and autumn pears, &c. agreeable to foregoing intimations.

It may be proper to observe, that when we speak of Walls in these intimations for planting and training Wall-trees, may also, besides common brick or stone walls, include wood-walls or palings, which being formed of close-joined boarding are also eligible on which to plant any sorts of Wall-trees; though, as not being generally so warm as good brick walls, the fruit probably will not attain maturity so soon in their proper seasons as on brick or stone walls, but otherwise in very good perfection.

In preparing for planting, if a general plantation, have the borders trenched a proper depth, of about two spades, or if only some trees in different parts, may only dig a wide space for each tree for the present; observing to allow proper distances, according to the different sorts; that is, for the peaches, nectarines, apricots, cherries, plums, figs, fifteen to eighteen feet is eligible; pears and apples eighteen or twenty feet, especially those worked on free stocks, or those on dwarf stocks, not less than fifteen to eighteen feet distance; and the same of other trees of similar growth: vines, five to ten or fifteen feet, according as may be intended to train them upright or horizontally, as they admit of both these orders of training; so that, agreeable to these intimations, mark out the distances accordingly.

Then, either previously, or at the time of planting, dig a circular pit for each tree, half a yard to two or three feet wide, proportionally to the expansion of the roots of different trees, and a good spade deep; laying the excavated earth of each hole close by the side, ready to fill in about the roots of the trees at the time of planting.

Having the trees for planting carefully taken up in the nursery, with their full spread of roots as entire as possible, and of which, at the time of planting, cut only any broken, mangled, or bruised parts, or shorten very long stragglers, and any downright tap root; and in the head, if young trees of only a year or two old, with the first main shoots from budding, &c. entire, not having been headed in the

nursery, reserve the said head whole till after they are planted, or not pruned till the spring : and if trained trees of several years' growth, having been headed, and thereby furnished with a spread of branches that have had a regular training in the nursery, two, three, or four years, cut out only any very irregular placed fore-right shoots or any other disorderly growth ineligibly situated for training to the wall, and any casual rank luxuriant of last summer : but continue all the regular-placed side and terminal shoots, wholly entire, at least till after the trees are planted.

Proceeding then in the planting, having digged a proper aperture for each tree, of eligible width and depth, at the requisite distances before mentioned, plant them therein accordingly, placing each tree with the bottom of its stem about three or four inches from the wall, inclining the top-part and head close thereto above ; making the roots spread regularly in the hole, and spade in the earth equally, breaking large lumpy clods, and shaking the tree by the stem gently up and down to make the earth settle in close between all the roots and radical fibres, and thus fill in each hole to the top, being careful that the upper roots are at least three or four inches depth under the surface ; then tread the earth down moderately, both to settle it close about the roots, and to fix the tree with its head inclining to the wall in the proper position.

As soon as planted, if a tolerably dry light soil, a moderate watering to the earth about the roots of the trees would be eligible, thereby to settle it close, and to have it moderately moist, to promote their striking fresh root, especially in early autumn and late spring planting ; and in the latter, if very dry weather prevail, a repetition of moderate watering once a week would be very beneficial.

Thus, the new-planted trees will soon strike root ; those planted early in autumn will often strike the same season, ready to shoot freely in the spring ; and those of the spring planting will quickly take root and soon show signs of renewed growth in their advancing buds.

Then, as to their further management after planting, in regard to pruning and training, observe the following general intimations in their present state, referring to the respective genera for the particulars relative to each sort, both in their young and advanced growth.

First, with respect to the young trees of a year old, having their first head or main shoots from the budding, &c. entire, they should be cut down early in March, to four, five, or six eyes, according to their strength, to procure lower lateral shoots the same year, from the said eyes, as before observed, to form the first

proper set of bottom branches, and then afterwards managed agreeable to former intimations, and as fully explained under their different genera.

And respecting the trained trees, such as previous to planting have been formed by proper training in the nursery, furnished with an expansion of several mother branches, and these furnished with a production of young shoots of the last summer ; they may be pruned and trained in the proper order as soon after planting as may be convenient ; in which prune out any irregular-placed shoots, and such as appear of an unpropitious nature, either rankly luxuriant, or very slender feeble growths, and any watery unripened and thickclubbed shoots ; as also any superfluous or over-abundant that may occur in any particular parts of the tree ; observing at the same time to preserve all the proper grown regular-placed shoots, both laterals and a terminal one or leader to each branch ; and which, in peaches, nectarines, apricots, and vines, should be shortened more or less, as directed for each of these sorts under its proper genus : and in pears, plums, cherries, apples, and figs, &c. the reserved proper shoots should generally be continued entire, as is also directed under their respective genera ; then let the whole, thus regulated in the operation of pruning, be trained to the wall horizontally, and equally to both sides of the tree in a regular expansion, three or four to five or six inches asunder, or more, according to the different sorts ; and thus nailed along straight and close to the wall, in a neat manner.

All Wall-trees in their general growth, from that of one or two years to their utmost advanced state, require an annual regulation of pruning and training ; consisting of a summer and winter dressing, in order both to continue them in proper regularity, and each tree within its limited bounds, and to preserve the whole in a prosperous state of plentiful fruitfulness, a principal article of consideration.

The summer-pruning consists of a general regulation among the young shoots of the year only ; which may be commenced in May or early in June ; first, by displacing the fore-right and other irregular-placed advancing buds or young shoots, not eligibly situated for training to the wall, taking them off quite close ; which, if proceeded in early in summer, whilst the shoots are yet tender and herbaceous, as it were, may be performed with the hand, without the assistance of the pruning-knife, by rubbing or detaching them close off with the thumb and finger ; but when more advanced, of a woody nature, the knife must be used in that operation ; observing also, in this the summer dressing or regulation of the shoots of

of the year, to displace many of the superfluous or such as appear any where too numerous, cutting out some of the worst or most irregular, likewise any rude luxuriant or singularly rank growth, in very thick sappy shoots; being careful, at the same time, to leave an abundant supply of the regular-placed, well-formed shoots in all parts of the trees, both of the laterals, and a terminal to every branch, in order for training close to the Wall during the summer, both to preserve the requisite regularity in the trees, and that, by being thus continued close and regular, to give full admission to the sun and air, &c. for the benefit of the fruit; the whole to remain in this order till winter, to have plenty to choose from in that season in the general pruning, according as they may then be wanted: but at this time, the summer pruning, retain considerably the most abundant in peaches, nectarines, apricots, vines, figs, which all produce their fruit on the young year-old wood, and require a successional supply annually; and retain a more moderate supply of the best-placed in pears, plums, cherries, &c. as these trees continue bearing several years on the same branches, not requiring a general annual succession of young wood, as the above sorts.

And thus proceeding in divesting the trees of the improper and unnecessary shoots, let all the others, now retained, be trained in close and regular to the wall, the whole at their full length during the summer, except where any extend much out of their allotted bounds in a disorderly growth; or in vines particularly, the long advancing fruit-shoots, furnished with grapes, may be shortened in July or August, to give greater nourishment to the growth of the fruit; and observing during the summer's growth of the Wall-trees in general, that, according as the retained shoots extend in length, to train them along close to the Wall in regular order; as also any that start from their places, or project from the Wall, train them in close; both to preserve the regularity of the trees as before observed, and that the fruit may not be too much shaded by projecting growths, but that, by having the whole continued always trained close and regular, it may thereby enjoy the full advantage intended by Wall-trees, of receiving all possible benefit of the sun's influence, warm, free air, rains, dews, &c. to promote that superior growth and degree of mature perfection, both in its early ripening, and improved flavour, peculiar to Wall-tree fruit.

Sometimes, in the summer pruning, either in young trees under training, or in others of advanced growth, in which there are va-

cancies, and supplies of branches wanted, may occasionally, in June, pinch or prune down one or more strong shoots, situated in or near the vacant spaces, shortening them to three or four eyes, to obtain a supply of the like number of lateral shoots therefrom the same season, and thereby furnish the vacancies in some degree the same year accordingly; by which acquisition, a year's advanced growth is gained, on consideration that if the said shoots now advised to be pruned are left unshortened till the following winter or spring pruning, and pruned for the above occasion, they consequently would not produce the laterals before the ensuing summer.

The winter pruning of Wall-trees consists of a general regulation, both in the supply of young shoots reserved and trained in the preceding summer; and in the general older branches occasionally.

This general pruning may be proceeded in any time after the falling of the leaf in October or rather November, till the spring, not later than March; and in which period of time it may be performed on most sorts of wall-trees; or may first proceed in the early part of winter, in November and December, principally in pruning pears, plums, cherries, apples, and vines; and may delay pruning peaches, nectarines and apricots, till more towards the spring, January and February, when their blossom-buds, which arise principally on the young shoots of the last summer, will be more advanced and conspicuous to enable you to make a proper choice of the most fruitful shoots to retain for producing the fruit next summer: and in figs particularly, it is advisable to defer pruning them wholly till the spring, on account of their succulent shoots being more liable many of them to be killed by frost in rigorous winters, than those of other wall-trees, and by leaving them unpruned till spring, there will be the greater chance, out of the whole, of a sufficiency surviving the frost to choose from to retain for next summer's bearers; for these trees always produce their fruit on the year-old shoots only; however any other wall-trees may be winter-pruned any time in the period above-mentioned, from November till spring, but should be wholly finished by the end of March or beginning of April at farthest; or generally in the early blossoming trees, should be completed much sooner, or not later than February or beginning of March, if possible; such as peaches, nectarines and apricots, as the blossom-buds of these trees will then be considerably advanced, and many of them would be unavoidably rubbed off in the pruning and nailing.

Observe generally, in proceeding with the winter pruning, that it is proper to unnaïl all or most of the young shoots trained in last summer, to have the better opportunity both of examining what are proper to retain, and what to cut out, as well as to admit of performing the operation of pruning more accurately; in which, observe, that in all the trees as produce their fruit on the young wood, principally the year-old shoots of the preceding summer, such as peaches, nectarines, apricots, vines, and figs, also morello cherries, a general supply of the said young shoots must now, in the winter-pruning, be retained in all parts of the trees, for training in at three, four or five inches distance or more, according to the different sorts, as successional bearers, to produce fruit the ensuing summer, choosing the most regular-placed, of the best moderately strong growth, and that appear of the most fruitful nature; and of which to retain both sufficiently of the laterals situated on the sides of the mother branches, and a terminal or leading shoot to each branch, either placed naturally at the termination thereof, or occasionally some part of the branches, where advanced long and naked above, pruned down to some eligible shoot for a leader; cutting out all the superfluous or overabundant, irregular and improper shoots, quite close, not leaving any stumps, but cut close to the old wood: pruning away also, in these trees, part of the former year's bearers, and occasionally any casual naked old branches, to make room for training the eligible succession of the above mentioned young bearers; observing in the general pruning, that in occasionally shortening any too long advanced naked parts, either of the former years' bearers or older branches, furnished with eligible young shoots, should generally prune down to some proper young shoot, situate on the said branches, so as each branch may still have a terminal one for its leader: likewise observing, in proceeding in this pruning, that in peaches, apricots, and nectarines, most of the retained shoots should be shortened about one third of their length, or a little more or less, according to their strength, and as the blossom-buds thereon are situated higher or lower: and in vines, prune the shoots to three or four to five or six joints, according to their strength and situation on the vine; but in figs and cherries, none of the shoots must be shortened, all retained at their full length; as these trees bear their fruit mostly on the upper part of their respective shoots; and generally observing, in pruning the peaches, nectarines, and apricots, that as these trees are often furnished with some small short natural

spurs, situated on the two or three years, wood, of an inch or two in length, generally having each several good blossom-buds, they should be preserved, as these also produce very good fruit.

Then as soon as one tree is thus winter-pruned, let the whole be regularly trained to the wall, both young and old branches, extended horizontally, and nailed along straight and close to the wall at regular distances; the peaches, nectarines, apricots, and morello cherries, three, four, or five inches asunder, figs about six inches, and vines six or eight inches distance. See the different sorts under their respective genera, *Amygdalus*, *Prunus*, *Ficus*, and *Vitis*.

And in winter-pruning pears, plums, cherries, and apples, in wall-trees; observe that as all these sorts, when advanced to a bearing state, continue fruitful on the same branches many years, generally on small spurs, thick short natural shoots, one or two inches long, arising from the sides and ends of the general branches, of two, three, four or five, to many years' growth; and which branches must be retained accordingly as long as they continue of a good fruitful state: and accordingly as any, in their advanced old growth, casually decline bearing, a succession of young wood must be trained in, ready to supply their place.

So that having in the preceding summer trained in a portion of the best well-placed shoots, ready to choose from where any are now wanted in the winter pruning, either to supply vacancies in young trees under training, or occasionally in deficient parts of old trees; and of which shoots selecting what may be necessary for the above occasions, in proper parts of the tree where wanted, either to supply a present vacancy, or to train up between particular branches, where any appear on the decline or defective in bearing, and retain them accordingly; also a leader young shoot to each branch in all parts of the tree, where room, to extend them, cutting out all others, not wanted for these occasions, close to the mother branches; or any old branch extending beyond the limited bounds, prune it down to some convenient lateral branch, or young shoot, as they may occur properly situated; also where any old branch or other discovers a declined unfruitful state, cut it out, especially where young wood, either in previous training, or neighbouring fruitful branches, are properly situated to bring in to supply its place; observing also, in these trees, that all the shoots and branches are to be continued always entire, not however shortened except on some particular occasion either of defect in growth,

growth, or of too considerable extension out of their proper limits; but otherwise all retained at their full length; as they mostly produce their fruit-spurs both along the sides, and at their extreme parts, that if generally shortened, it would both demolish the said extreme fruitful parts, and force out strong lateral, useless shoots below instead of fruit-buds, and thereby greatly diminish their production of fruit: therefore observe the above precaution in the general course of pruning these sorts of wall-trees; retain the branches generally at their full length, and carefully preserve all the proper fruit-spurs, and they will bear abundantly. See each sort under its proper genus.

According as each tree is thus winter-pruned, let all the branches, &c. be regularly trained and nailed in straight and close to the wall horizontally, four to five or six inches distance, according to the different sorts, the cherries and plums three or four inches asunder, the pears and apples five or six inches distance.

For nailing wall-trees, should be furnished with the proper sorts of nails, which are obtained at all the ironmongers' shops by the name of garden wall-nails, having those for brick-walls that are of the short robust kind, as will occasionally drive into a brick, or hold fast in the mortar of the joints; but some stone walls will require nails of a longer size; and for nailing to paling or board walls, the nails may be narrower and more pointed than those for brick-wall nailing.

Likewise have proper supplies of woollen cloth shreds, either lifting of broad cloth, as the most eligible, both in strength, and convenient for cutting into proper breadths and lengths, or, in default of this, any cuttings of cloth will suffice; observing generally in cutting the shreds for the nailing, neither to cut them too wide nor uncommonly long, half an inch to an inch at most wide, by two or three inches long, for the general common shoots and smaller branches; but for the larger, must be longer an inch or two in proportion; likewise generally cut them somewhat regular in width, and with the ends even; not leave them with long, dangling, pointed ends, which have a slovenly appearance when on the trees.

And in the work of nailing the trees, arranging the branches horizontally, extend them always parallelly and as straight as possible, close to the wall, by means of the shreds and nails; generally placing the shreds round the shoots, &c. in the spaces between the eyes, not too near together, or than what is necessary to fix the shoots or branches straight in the pro-

per position, and commonly with both ends of the shreds even; and thus nail them to the wall; in which observe not to girt the shreds too tight, but moderately close, about each branch and shoot, and not to drive the nails farther into the wall than just to take sufficient hold; for when driven too far they are apt to loosen the mortar, &c. in brick or stone walls, especially when occasionally un-nailing preparatory to the winter pruning.

And generally observe, in unnailing wall-trees, as is generally necessary in the Winter-pruning, more or less, especially in most of the young shoots trained in the preceding summer, and often in many of the older branches, it is proper, previous to drawing the nails, to give each a gentle stroke of the nailing-hammer to loosen it in its place, by which it will more readily draw clean out without tearing the mortar of the joints of the wall.

WALTHERIA. *Waltheria*.

The plants are woody exotics, from the warm parts of America and India, and retained here in stoves for variety; rising with woody stems, from two or three to four or five feet high, adorned with oval and spear-shaped leaves, and bunches of pentapetalous flowers.

Class and order, *Monadelphia Pentandria*.

Characters.] CALYX is monophyllous, cyathiform or cup-shaped, five-parted, and permanent. COROLLA, five heart-shaped spreading petals. STAMINA, five short monadelphous filaments, having distinct antheræ. PISTILLUM, an oval germen, slender style, and pencilled stigma. PERICARPIUM, an oboval, bivalved, unilocular capsule, and one obtuse seed.

The species are,

1. WALTHERIA *americana*.

American Waltheria.] Rises with a ligneous soft stalk, branching sparingly two or three feet high; large, oval, plicated, sawed, indented leaves; and from the upper parts of the branches, round heads or bunches of yellow flowers, on proper peduncles.

2. WALTHERIA *indica*.

Indian Waltheria.] Rises with a woody stem, dividing and branching eight or ten feet high; having soft, woolly branches; large, oval, serrated, plicated leaves; and smallish yellow flowers, in round bunches, sitting close, without peduncles or foot stalks.

3. WALTHERIA *angustifolia*.

Narrow-leaved American Waltheria.] Rises with ligneous stalks, dividing and branching six or seven feet high; spear-shaped sawed leaves; and round bunches of yellow flowers, on proper peduncles.

They

They all flower in summer, continuing in succession several months; succeeded by ripe seeds in autumn.

All the three sorts are somewhat shrubby; durable in stem and branches, at least for several years; though, as they are generally raised from seed, they arrive to perfection in two years, so as to flower and produce seeds; and sometimes continue several years, and flower annually in summer.

As they are tender exotics from hot countries, they must always be kept in a stove here.

They are propagated by seed, sown in a hot-bed; and when the plants are fit to remove, plant them separately in pots, and plunge them in the bark-bed; and managed as other woody plants of the stove collection.

WATER.

Water, where attainable to introduce in garden designs in smaller or larger expanse, is an important object, and may be considered both useful and ornamental in general gardening: it being of great utility in every garden district, in the article of Watering numerous sorts of young plants and trees, seed-beds, &c. occasionally, especially in the drought of spring and summer, both to such as grow in the full ground, and in pots in the open air, and to those in green-houses, stoves, hot-beds, &c. many of which could not exist without occasional Watering; and in ornamental designs, a body of Water properly disposed in eligible situations in pleasure grounds, parks, &c. either formed into regular compartments, circular, oval, or in oblong canals, &c. or varied in a somewhat natural expanse in curves and bendings, has a beautiful effect, especially as it may be agreeably accommodated to almost every situation and exposure; and delightful, where it is conspicuous at some small distance within view of the habitation, lawns, and other principal districts, being bounded with open expanded spaces of grass, and its banks diversified with some detached clumps of plantation.

But one great article to be considered is the attainment of proper supplies of Water to supply the intended design, either by springs in or near the place, or by currents or streams passing through, or nearly adjacent, to admit of being conducted to the proper situation in the garden, &c. which will afford a superior advantage in executing any particular design the most effectually; or conducted from some neighbouring river, brook, or lake, &c. by means of pipes or small cuts, or by collected Waters issuing from higher grounds, conducted by proper channels to the allotted places, in which any space or compartment of water is intended,

useful or ornamental: all of which requisite accommodations should be considered, how far attainable, previous to the formation of any design of this kind.

It is likewise to be considered, the means by which to retain the water sufficiently, after being acquired in the allotted place as above; which, if a loose earthy, sandy, or gravelly bottom, it will soon sink away, especially in dry weather, unless there is a constant current or flow of water running in, either by springs, or some running stream; but when of a naturally strong clayey bottom of proper thickness both at sides and below, it may probably retain the water in some tolerable degree: as however this kind of bottom is rarely equally effectual in all parts of it; and therefore generally in this case, and that of the natural bottom being of any loose soil above intimated, the whole, after being excavated to the proper depth, must be well secured by addition of a thick coat of strong clay laid at bottom and sides; and well rammed, as hereafter directed, also under the article BASONS, &c.

For useful occasions in the article of watering the various plants of gardens, reservoirs of Water, where easily attainable by either of the means before intimated, should not be omitted, in a smaller or larger scale, especially in principal gardens of any considerable extent; proportioned in some moderate dimensions according to the supply of Water that can be acquired; but where intended principally as a useful reservoir for watering the garden, may be of much more moderate dimensions than when designed also for ornament; and may be formed either in a circular manner, or an oblong canal, pond, or cut, &c. generally adopted in some lower part, or where the furnishing supply of Water can be most conveniently procured; or however some reservoirs of Water may be introduced in a general garden, both to serve for the above occasion of Watering, and for ornament: in which they may be of more capacious dimensions, and decoratively formed.

But Water is most essentially useful in every principal kitchen garden, pleasure ground, and nursery, for occasional Watering in dry weather in spring and summer; and also in winter in green-houses and stoves, &c. but more considerably in numerous articles in the open ground, both of seed-beds, and the various young plants therein raised: and to numerous sorts of young plants, cuttings, slips, off-sets, &c. newly pricked out or transplanted, both at the time of first planting, and afterwards occasionally, when dry hot weather prevails; as also in many sorts of new planted young

trees

trees and shrubs in spring and early autumn planting; and to all plants in pots, both hardy sorts and others in the open air in dry hot weather, in spring and summer; and to all the tender kinds in pots, of the green-house and stove; and all plants in hot-beds under glasses, &c. as before observed; and for all of which occasions, if the Water is contained in any kind of reservoir formed as above mentioned, it is not only more convenient for immediate use, but is considerably more salutary for the growth of all vegetables than raw sharp Water drawn for use immediately out of wells.

Or as in many places there are natural ponds, canals, or other reservoirs of Water close in the neighbourhood of gardens, commodiously situated for obtaining sufficient plenty for watering, the trouble and expense of making basons, canals, or other reservoirs, principally for that purpose, may be saved, except in particular occasions in extensive kitchen grounds, &c. where the articles for watering are considerable, and disposed in many different distant compartments: and for which, Water-cuts, canals, basons, or small ponds, would be essentially convenient in proper situations where a sufficiency of Water could be obtained by the means before mentioned, to keep them properly furnished.

Ornamental compartments of Water in pleasure-grounds are very desirable objects, as a great addition to the beauty, variety, and embellishment of these districts, when properly disposed, and contrasted with some nearly-adjoining, detached clumps of plantation, and bounded with a proper expanse of grass ground, spreading from the verge considerably outwards, and the extent of Water proportioned in some degree to designs of large composition, or adapted to smaller, or according to the situation of the place, and the supply of Water that can be commodiously obtained by the means before suggested, sufficient to continue the allotted space always equally full to the requisite height and extent.

With regard to the proper situation in a pleasure-ground, park, &c. in which to have any intended piece of Water, this consequently must either be in some lower part, less or more, or where the most eligibly convenient for the attainment of a sufficiency of Water at all times to supply the extent of space allotted for the intended purpose, and for the advantage of having it more conspicuous to sight at some moderate distance; generally in some principal part disposed in a conspicuous point of view, at some convenient distance from the main habitation, as also to show agreea-

bly from the principal lawns and Walks extending immediately from or contiguous to the said mansion; and with occasional interval views from other principal parts of the pleasure-ground, especially where the surface of Water is of some considerable dimensions; but where unavoidably small, that is the less material in extensive grounds, as it would not make any conspicuous appearance at a distance.

However, in general designs, where any spaces of Water, on a larger or smaller scale, are intended, they should always be disposed as conspicuously as convenient, in some principal division; either sometimes at or near the termination of a spacious open lawn, or occasionally in some other similar open space; and sometimes disposed more or less internally in some central or other grand opening; in all of which a noble expanse of Water would have a fine effect; and where the attainment of Water for that occasion is abundant, and the situation not too much limited, it might be extended in a diversified order in some natural imitation, which, in large designs particularly, should generally be adopted in preference to a perfectly formal regularity: but in smaller gardens, the regular form may be more conformably admissible, either circular in the manner of a bason, or oblong in the order of a canal, &c. or even in these forms the stiff regularity may be broken, by varied curves in the margin.

Respecting, however, the general form and extent for any intended design in ornamental compartments of Water, they, in regard to form, may either be of a regular figure, as circular, oval, oblong, &c. or in a varied natural imitation, in different moderate curves and bendings; and in dimensions may either be considerably extensive, or of middling or small extent, conformably to the general plan of the garden, &c. and different situations of the ground: for as no particular dimensions can be assigned, this must depend on circumstances, both in regard to the nature of the situation, and extent of the proposed space, eligible for that purpose, and according to the supply of Water attainable therein for the desired occasion, or as may be thought expedient, either consistent with convenience, or the eligibility, more or less, of the particular parts of the pleasure-ground, park, or the most desirably situated for adopting the design with the greatest successful effect; as sometimes, in extensive designs, an ornamental piece of Water forms an expanse of one or two to several acres extent; and in others of more contracted or small plans, is sometimes not

not half an acre, and in some not half that space; and in all of which larger or smaller designs, the form may be varied more or less accordingly; such as when intended to have any compartment of Water formed in some imitation of a natural order, the figure may be varied either in the roundish spreading, or oblong manner in gentle bendings, swells and curves, of different forms and dimensions; or in some situations may be formed in imitation of a natural river, or lake, &c. in easy varied windings: and the extreme terminations of which by a peculiar sweep round projecting swells of ground, furnished with clumps of plantation, may seem to proceed in continuation in another direction: or in gardens where a natural stream can be introduced, it will afford great opportunity in forming any particular or different designs in Water, sometimes in the form of a gently winding rivulet, or more copious river, or in some particular situations, spread out in a wide expanse of surface.

Cascades or Water-falls are also occasionally introduced in extensive grounds where there is the advantage of a rivulet, by which a cascade may be formed either in one larger fall, or in two or three smaller in succession, having large rough stones placed below to break the Water, and increase the sound of the torrent in its fall and passage over them, in some degree similar to that peculiar to natural cascades.

Fountains, spouting Water from some image, are sometimes introduced in the centre of small or moderate basins, or other reservoirs of Water in gardens, where a supplying head of Water is conveniently situated sufficiently high to raise and throw the Water from the jet or spout in a continued full stream to some considerable height, which falling in the basin or reservoir, keeps the Water thereof in motion, prevents stagnation, and is thereby rendered more beneficially wholesome for keeping and breeding fish of the gold and silver kind, &c. and the spouting and fall of the Water conveys a refreshing idea in the heat of summer.

In the formation of the ground designed for compartments of Water, the earth must be excavated as much as necessary to a proper depth, gradually sloping from the verge to the middle, two or three to four or five feet deep, not more; but as sometimes in low situations, the eligible place is naturally hollowed in some degree more or less, as not to require a general excavation, or only in particular parts, and some general regulations to the whole, which in extensive designs, would be a con-

siderable advantage; observing, however, in general, if the sides and bottom are of a sandy, gravelly, or stony nature, or abound in any loose soil, and that there is not a constant supplying stream, it must be well secured with the application of a thick coat of wrought clay to retain the Water; or even if the general natural bottom is clayey, it is seldom wholly effectual in every part to hold Water sufficiently well at all seasons, without the above advantage of a constant supplying stream; and therefore in these deficiencies the addition of a proper stratum of clay is commonly necessary, except as above said, in such places where there is a copious natural flow of Water, in which probably no claying will be required; which will be a particular advantage in large designs.

However, where claying is necessary, generally observe, in the preparatory excavation, to allow for a proper depth and width of the additional coat of clay twelve or fifteen inches thick, and of several inches of gravel over this, to preserve the clay from being wasted by the motion of the Water, and to keep the Water always clear, which otherwise would be muddy from the nature of the clay; and observing, previous to the claying, generally to ram any loose or uneven parts in the bottom or sides of the cavity, making the whole firm, even, and smooth; then applying the clay, begin first in the middle space, proceeding gradually outward, being careful that no stones, sticks, or other matter, get mixed therewith to occasion fissures or chasms for the Water to escape; laying it evenly, a small thickness at a time, and spread it regularly, treading it with men's naked feet; and if dry weather cast water on it occasionally, ramming it well from time to time with wooden rammers; applying more clay by degrees, in the same manner, to the proper thickness as above, giving attention that every part is well kneaded and rammed, not to leave the smallest vacancy; for the Water is apt to escape at the least cranny, and would occasion great trouble afterwards to find out the defective place; and thus continue the claying regularly each way from bottom to the top of the circumference, smoothing the surface evenly; and if dry weather cover it, as you proceed, either with mats or straw litter, or with the necessary stratum of pebbly gravel, three to four or five inches thick, to preserve the clay from cracking, by the sun, air, and wind; and when the whole is thus finished, let in the Water as soon as possible.

Then proceed to regulate and level the top superficies of the circumference or verge, and the

the immediately adjoining ground, forming it evenly from the Water edge in a gradual regular expansion to some tolerable extent outward, without forming any stiff slope immediately close to the Water, distinct from the surrounding superficies; but if any is thought necessary, whereby to admit of a more conspicuous view of the Water at a distance, generally form it in one continued gradual slope from the margin evenly outward, correspondent with the general surrounding surface of the adjacent ground; and then either lay the ground with grass turf, especially along the margin, continued as far down as the Water will apparently stand in general; and the other part may either be also turfed, or if of very considerable extent, in which a sufficiency of turf may not be easily attainable, may be sown with grass seed, or according as either shall seem the most convenient: or, in some designs, may have some width of grass next the Water, and then a space of gravel, either as a regular walk, or extended of any eligible width as may be thought expedient.

In preparing for the formation of a body of Water, in situations where the place intended is in any parts deficient, or too low in the boundary, either at the ends or sides, being lower than the general surface, or than the requisite height intended the Water shall stand, this must be strongly banked up accordingly to the required height, very substantially in thickness, especially where it happens to form a head at one end of a canal, &c. and have the whole faced inwardly with a strong body of clay.

WINTERA.

Winter's Bark, or Bastard Cinnamon.

For the stove, one species; a curious aromatic tree from South America, very branchy all round the stem; garnished with oblong, light-green leaves; and pentapetalous dodecandrous flowers in terminal umbels.

Class and order, *Dodecandria Monogynia*.

Characters.] CALYX is bell-shaped, trilobed, with the lobes roundish and concave. COROLLA, five oblong, sessile petals, longer than the calyx; and a conical, pitcher-shaped nectarium. STAMINA, no filaments; but twelve or sixteen linear, distant antheræ, affixed to the outside of the nectarium. PISTILLUM, an oval germen, cylindric style, with three obtuse stigmas. PERICARPIUM, a roundish, trilocular berry, with two heart-shaped seeds.

There is but one species, which is wholly a fine aromatic.

WINTERA *Canella*.

American Wintera.] Rises with a thick woody stem, branching on every side, almost the whole length, growing near twenty feet high; having a lightish-coloured aromatic bark; oblong, obtuse, light-green leaves; and red flowers, in umbellate clusters, at the ends of the branches, succeeded by roundish berries.

This tree, being a native of the hot parts of America, must always be kept in a stove in this country, and in which it merits observation as a curious aromatic tree, to increase the variety of the exotics in that department; and should be planted in pots of light, mellow, loamy earth, and treated as other woody plants of the stove collection.

X.

X E R

X E R

XERANTHEMUM. Eternal flower.

This genus furnishes herbaceous, curious flowering annuals for the pleasure-ground, and shrubby kinds for the green-house, growing two or three to four or five feet high; garnished with spear-shaped and linear leaves in the different species; and compound flowers at the sides and ends of the branches, com-

posed of many dry rigid florets, collected into one general scaly cup; and being of a dry chaffy nature, are remarkable for retaining their colours and beauty many months after being gathered.

Class and order, *Syngenesia Polygamia Superflua*.

Characters.] CALYX, a compound flower, having

having the general calyx composed of many long spear-shaped scales. COROLLA, composed of many hermaphrodite florets in the disk, each consisting of one funnel-shaped petal, five-parted at top; and tubular female florets in the radius, more slightly cut at the brim. STAMINA, five very short filaments, and long cylindric antheræ. PISTILLUM, a short germen; filiform style, having a bifid stigma in the hermaphrodites, and in the females two reflexed stigmas. PERICARPIUM, none; each floret succeeded by an oblong, coronated seed, placed on a chaffy receptacle.

The plants of this genus derive the name Eternal Flower from the great durability of the flowers, which being gathered when fully blown, will retain their beauty many months.

There are many species, but the most remarkable of which are the following eight sorts, consisting of one hardy annual, and seven tender shrubby kinds.

Hardy annual kind.

Comprising the common Eternal Flower furnished with several varieties; all hardy herbaceous, ornamental-flowering annuals.

1. XERANTHEMUM *annuum*.

Annual Xeranthemum, or Common Eternal Flower.] Rises with an herbaceous, angular, downy, branching stalk, two or three feet high; spear-shaped, spreading, hoary, close-sitting leaves; and all the stalks and branches terminated by large flowers singly, of different colours in the varieties, appearing in July, August, and September, and are very ornamental, succeeded by ripe seeds in autumn.

Varieties are,] Large White-flowered—Purple-flowered—Double White-flowered—Double Purple-flowered—Double Violet-coloured.

The flowers of all these varieties are of the compound kind; consisting of many small florets in one common calyx, together forming one large flower, which in all the sorts is very ornamental, and in high estimation for the singularity of their durable beauty, even after being gathered; for if gathered when fully blown in dry weather, with part of the stalk to each, and hung up to dry in a shady place, they will retain their respective colours in full beauty all winter; and by placing the stalks in glasses or pots, not with water, but sand to make them stick fast, and placed in any apartment of a house, they will appear very ornamental.

They are all easily propagated by seeds sown in the full ground, in autumn or spring, or in both seasons; as the autumn-raised plants will flower earlier and strongest, and the spring plants will succeed them, and thereby

continue the succession of flowers proportionably longer.

Sow them for transplantation in any bed or border of good light earth, either on the surface and raked in, or in drills half an inch deep, and five or six inches asunder; and when the plants are come up two or three inches high, thin out a quantity of the strongest, and prick them either in beds in rows a foot asunder finally to remain, or in patches about the different borders to flower in assemblage with other hardy annuals; giving water as soon as planted, and repeated occasionally in dry weather till they have taken good root, and they will require no farther care except keeping them clean from weeds.

Or the seeds may be sown in patches in the different borders, in the places where you intend the plants shall flower.

Shrubby Green-house kinds.

These are tender exotics from Africa, trailing and upright shrubby plants, of three or four feet growth, closely garnished with small spear-shaped, linear and oval, hoary and silvery leaves; and large compound radiated silvery and yellow flowers, of long continuance in beauty, even after being gathered.

2. XERANTHEMUM *retortum*.

Reflexed-leaved Eternal Flower.] Under-shrubby, trailing stalks, garnished with recurved, reflexed, hoary-silvery leaves; and at the axillas of the branches, flowers with white rays and yellow disks.

3. XERANTHEMUM *speciosissimum*.

Most-specious Golden Eternal Flower.] Rises with an upright shrubby stem, branching three or four feet high; garnished with spear-shaped, trinervous, sessile leaves; and, at the termination of the branches, large bright, golden-yellow flowers.

4. XERANTHEMUM *sesamoides*.

Sesamum-like Silvery Eternal Flower.] Upright shrubby stem and slender hoary branches, three or four feet high; small, linear, adpressed leaves, laid close to the branches, and the branches terminated by large, silvery-flowers.

5. XERANTHEMUM *vestitum*.

Vestite, Leafy-flowered Xeranthemum.] Upright shrubby stem, branching three or four feet high; linear-spear-shaped, mucronated leaves; and terminal, leafy, white flowers.

6. XERANTHEMUM *fulgidum*.—Fulgid or Shining Eternal-Flower.

7. XERANTHEMUM *proliferum*.

Proliferous Eternal Flower.] Shrubby prolific stalks; granulous-roundish, lightly imbricated leaves, and close-sitting flowers.

8. XERANTHEMUM *imbricatum*.

Imbricated

Imbricated Eternal Flower.] Shrubby stalks, oval-awl-shaped, smooth, imbricated leaves.

Of the above green-house kinds of *Xeranthemum*, the first three or four species are the most noted; they are all tender plants, mostly from Africa, near the Cape of Good Hope, requiring protection in this country in winter, from October or November till May or June; therefore must be planted in pots, and have residence among the green-house exotics, where they will form a very agreeable variety at all seasons, and a pleasing singularity in their flowers, which appear conspicuously about July and August, continuing long in beauty; but are not generally succeeded by good ripe seeds in our gardens, for sowing; so that their propagation here is commonly effected by cuttings of the young shoots in summer, planted in pots of light mould, watered and shaded from the sun: or might be forwarded in a hot-bed, or covered close with a hand-glass, to expedite their emission of roots, and shooting in a moderate top growth the same season; and in autumn may be transplanted singly in pots, and afterwards managed as other green-house plants of the shrubby kind.

XYLOPHYLLA, Love Flower.

Comprehends two or three tender exotics for the stove, from the hot parts of America and the West-Indies: distinguish some with four-angled branches, others round; garnished with linear and spear-shaped leaves, and apetalous flowers.

Class and order, *Pentandria Trigynia*.

Characters.] CALYX, a six-parted coloured cup. COROLLA no petals; but nectariums

composed of six glandules affixed to the germen. STAMINA, five short filaments and single antheræ. PISTILLUM, a roundish germen, three short styles, crowned with lacerated stigmas. PERICARPIUM, a roundish, trilobular capsule; seeds double.

The species are,

1. XYLOPHYLLA *longifolia*.

Long-leaved Love Flower.] Rises with four-angled branches, garnished with long linear leaves.

2. XYLOPHYLLA *latifolia*.

Broad-leaved Love Flower.] Rises with round branches, and broad spear-shaped leaves.

3. XYLOPHYLLA *falcata*.

Falcated Love Flower.] Rises with a woody stem and branches, garnished with linear-spear-shaped shining leaves placed irregularly; and at the upper part of the branches, flowers produced upon the edges of the leaves, very closely placed.

These three exotics, natives originally of hot countries, are introduced in our stove collections for variety and curiosity; in which they must always reside in winter, but may be placed, in their pots, in the full air in the middle summer months, in a sheltered situation, and removed to the stove in September.

They are propagated by seeds in pots placed in a hot-bed, and when the plants are come up two or three inches in growth, prick them in separate pots, and plunge them in the bark-bed: and afterwards managed as other stove plants of a similar nature.

Likewise some of them by off-sets, slips and cuttings, assisted also by a hot-bed.

Y.

Y U C

YUCCA.

Adam's Needle.

This genus consists of shrubby succulent evergreens of America, both hardy and tender kinds, to diversify the pleasure-ground and green-house collection, rising with upright, thick, woody stems several feet high, adorned at top with clusters of very long, aloe-like,

stiff leaves, ending in long sharp spines; and at top, from among the leaves, long spikes of bell-shaped, six-parted, liliaceous flowers.

Class and order, *Hexandria Monogynia*.

Characters.] CALYX, none. COROLLA is monopetalous, bell-shaped, and divided into six large oval segments. STAMINA, six very short reflexed filaments, having small antheræ.

7 S 2

PISTIL-

PISTILLUM, an oval three-cornered germen longer than the stamina; no style, but an obtuse three-furrowed stigma. **PERICARPIUM**, an oblong, triangular, trind, trivalved capsule of three cells, containing many seeds lying over one another in a double series.

There are four species of *Yucca*, all of which are of singular growth; they rising with erect stems from two or three to six or eight feet high, terminated by a large tuft of very long leaves, resembling those of the aloe, but much narrower; have all durable stems and evergreen leaves; are natives of different parts of America, and two of them are moderately hardy to grow here in the full ground; and the other two, being more tender, require shelter of a green-house in winter.

Hardier kinds.

1. *YUCCA Gloriosa.*

Common Adam's Needle.] Rises with an erect, ligneous, thick stem, two or three feet high, having very long, narrow, stiff, entire leaves, ending in a long, sharp, black spine, garnishing the stem almost to the bottom, and in a large tuft at top; and from the centre of the top leaves rises a long branching peduncle, sustaining a panicle of bell-shaped white and purple flowers.

2. *YUCCA filamentosa.*

Filamentous, or Thready Virginia Yucca.] Rises with an upright, thick, ligneous stem two or three feet high, adorned at top with a tuft of very long spear-shaped, stiff, blunt-pointed, sawed, filamentose leaves, emitting long threads from the sides, hanging downward; and from the top of the stem amidst the leaves an erect peduncle or flower-stalk, several feet high, garnished with many large, white and purple striped leaves.

Both these species flower in August and September, and make an ornamental appearance, but are not succeeded by seeds in England.

They are natives of North America, the former that of Canada, and the latter of Virginia, and are both tolerably hardy; so as after having a little occasional shelter whilst young, for two or three winters, they may be turned out into the open ground in a sheltered situation in the shrubbery; though it is also proper to keep some always in pots, and treated as green-house plants, as a reserve in case those in the open ground should be cut off in very severe winters.

Tender Kinds for the Green-house.

3. *YUCCA aloifolia.*

Aloe-leaved Yucca.] Rises with an erect,

thick, fleshy stem, eight or ten feet high, crowned with a large tuft of long, narrow, stiff, crenated, aloe-like leaves ending in sharp spines; and from the centre of the crown of leaves comes out the flower-stalk, branching pyramidally two or three feet high, having all the branches terminating in a spike of flowers, purple without and white within, appearing in August and September.

4. *YUCCA Draconis.*

Dragon Tree-leaved Yucca.] Rises with an upright, thick, brown stem, three feet high, crowned with long, narrow, serrated leaves ending in spines and nodding downward; and in the centre of the leaves, arises the flower-stalk very branchy, with all the branches terminating in spikes of flesh-coloured flowers in August and September.

All these four species of *Yucca* being of singularly curious growth, they are worthy of culture in every good collection, keeping some of all the sorts in pots, to move to shelter of a green-house in winter; as they will afford a conspicuous and entertaining variety in this collection; and some plants of the two first sorts may also, after attaining a little strength and gradually hardened, be planted out in the full ground in some dry warm situation, sheltered by adjacent shrubs and trees, &c.

As all the sorts are of a succulent nature, they should always be planted in a light dry soil; if somewhat sandy, the better.

The propagation of all the sorts is by off-sets and suckers, from the root and head of the plants; also by seed.

By off-sets, &c.—These may be detached almost any time in spring and summer, and lay them in some dry place for a few days, till the wounded part made by separation from the plant is dried and healed over; then plant them in pots of light sandy compost, and place them in a shady situation till they have taken root.

By Seed.—This is obtained from abroad, and should be sown in the spring in pots of light earth, and plunged in a hot-bed, in which the plants will soon come up; and when they are two or three inches high, prick them separately in small pots of light sandy mould, plunging them also in a hot-bed to forward their growth, assisting them with moderate waterings and fresh air daily; and harden them by degrees to the full air in June and July, to remain till October, then removed into the green-house.

Z.

Z A N

ZAMIA. Dwarf Pinnated Palm.

Comprises some low species of the Palm tribe, of the West Indies, some of which are retained in our stove collections for variety, particularly one species, rising in robust stems only two or three feet high; ornamented with frondose pinnated leaves of many pair of oblong folioles; and male and female flowers separate on different plants, produced in a club-shaped spadix protruded from a spatha, each floret of the spadix having three petals, with proper stamina in the males, and germen and style in the females, succeeded by many red berries.

The principal species in our garden is,

1. ZAMIA pumila.

Dwarf Pinnated Palm with sawed Leaves.

Leaves thick, short, rigid, and slightly sawed.

The two following are also retained in some of our stoves.

2. ZAMIA spinosa.—Thorny Dwarf Palm.

3. ZAMIA integrifolia.—Entire-leaved Zamia.

They require a constant residence in the stove, planted in pots of rich light earth, and managed according to the general culture of other similar exotics of that department.

ZANTHOXYLUM. The Tooth-ach Tree.

This genus comprehends two species known in our gardens, one for the shrubbery, the other for the green house; the former of which is the most noted; a hardy exotic, originally from North America; the other from China; both of moderate growth, ten or twelve to fourteen feet high; garnished with large pinnated and trifoliate leaves; and dioecious apetalous flowers, in terminal paniced spikes.

Class and order, *Diœcia Pentandria*.

Characters. Male flower. CALYX, a perianthium deeply cut into five oval coloured parts. COROLLA, none. STAMINA, five awl-shaped erect filaments, with didymous, sulcated, roundish antheræ. Female flower. CALYX, as the male. COROLLA, none. PISTILLUM, a roundish germen, an awl-shaped style, with an obtuse stigma. PERICARPIUM, an oblong capsule, formed of two valves and

one cell, containing a single smooth roundish seed.

The name of Tooth-ach Tree being applied to this plant, arises from the use made of the bark in cleansing the teeth, and preventing that troublesome disorder among the inhabitants of Canada.

The species are,

1. ZANTHOXYLUM Clava Herculis.

Canada Tooth-ach Tree, or Hercules's Club.

It grows to the height of twelve feet, with a rough bark armed with short spines; the leaves are winged, of a dark-green colour, growing irregularly on the branches; each consists of four or five pair of spear-shaped folioles, which are terminated by an odd one; the flowers come out from the end of the branches in loose panicles; they being apetalous have no great appearance, and are succeeded by unilocular capsules, containing the seeds.

Variety. The Ash-leaved Tooth-ach Tree, with oval-oblong folioles, and prickly mid-ribs.

2. ZANTHOXYLUM trifoliatum.

Trifoliate Chinese Tooth-ach Tree. Rises with a woody stem, branching several feet high, garnished with trifoliate leaves, composed of three egg-oval folioles.

Of these two species, the first is the most noted and generally known in our garden plantations; the second is sometimes retained as a green-house plant, but will also succeed in the open ground in a warm situation: and both the sorts are very eligible to arrange in the shrubbery in assemblage with other deciduous kinds to increase the variety; generally allotting them a sheltered situation and dry soil, where they will succeed, and form an agreeable diversity in their pinnated and trifoliate leaves; but it is also proper to keep some of the Chinese sort in pots to move under protection, in winter, of a green-house, or awning, &c.

They are propagated by seeds and layers. Sow the seeds in the spring, either in an east border, or in pots placed in the morning sun all summer, sheltered in a frame in winter; and in spring removed to the full air till October,

ber, giving proper waterings all summer; and towards winter placed again under shelter from frost till March; then the young plants may be potted separately; and thus continued for a year or two, and sheltered in winter, then may be transplanted into the shrubbery.

By layers of the young wood in autumn or spring, they may also be propagated.

Likewise by cuttings in spring or summer, assisted by a hot-bed in which they will strike, then should be inured to the full air; and they will form young plants for transplanting in autumn or spring following.

ZEA (*Mays*), Indian corn, or Turkey wheat.

Consists of a tall-growing, herbaceous, hardy annual to cultivate for variety in the borders and other compartments of the pleasure-ground, &c. ornamented with long pendulous leaves, and monœcious husky flowers in long spikes, at the sides and upper part of the stalks; succeeded in the female flowers by many large, roundish seeds, closely placed round an oblong receptacle, which are the corn, the eatable part; though not used in this country for that occasion.

Class and order, *Monœcia Triandria*.

Characters.] Male and female flowers separate on the same plant; loosely disposed **CALYX**, a bivalve, two-flowered husk. **COROLLA**, two oblong valves, the outward one obtuse and bellied, and the interior bidentate at top, and are inclosed in the calyx, with a very short, diphyllous nectarium. **STAMINA**, three capillary filaments in the males, with bifid prismatic antheræ, opening at top; the female flowers are closely collected in a spike below the males on the same plant; the calyx a single-flowered husk, with two valves; with a corolla, a glumose husk, and four membranous unequal valves. **PISTILLUM**, a very small germen, slender pendulous style, and simple stigma. **PERICARPIUM**, none; many compressed, roundish seeds, immersed in an oblong, thick five-angled receptacle, forming together a long, thick, close head of corn.

The species is,

ZEA Mays.

Mays, or Indian Corn.] Rise with a large, strong, herbaceous stem, ten or twelve feet high, garnished with long, broad, pendulous leaves; male flowers, at the upper part of the stalks in spikes eight or ten inches long; and females arising at the axillas of the leaves below the males, in long, close, thick spikes, covered with thin leaves; and succeeded by the numerous seeds placed round the long receptacle in a compact order.

Variety.] Yellowish-white seeds—Deep yellow seeds—Purple-blue seeds.

This plant is very much cultivated in America and south of Europe for the seeds or corn, which being ground to meal, serve as food for the poorer inhabitants.

But in this country the plant is raised principally for curiosity and variety of its singularly tall growth, superior to most of our herbaceous plants; and in favourable seasons will produce ripe seeds in autumn.

It is raised from seed in the spring, March or April, either in a dry warm situation, where the plants are intended to remain: sowing them in patches, two or three seeds or more in each place, about an inch and half deep; but when the plants are up, leave generally but one of the strongest; or to have the plants as forward as possible to produce ripe seed-spikes more effectually, some may be sown in a hot-bed in March or beginning of April, and when the plants are three or four inches high, may be forwarded by pricking upon another hot-bed, either under a deep frame or an awning of hoop arches to cover with mats occasionally; allowing them plenty of free air; and in May, they may be transplanted, with balls of earth about their roots, into the full ground in borders, or shrubbery clumps, &c. in a warm sunny situation, and watered; and that if the summer proves warm and dry, they will produce perfect heads, and the seeds will ripen.

As the plants run up fast in tall stalks, it may be proper to support each with a tall neat stake, especially where exposed to the wind.

ZINNIA.

A genus of annual plants, cultivated for ornamenting the pleasure and flower gardens, growing with erect stalks, garnished with oblong leaves, and producing radiated flowers.

Class and order, *Syngenesia Polygamia Superflua*.

Characters.] **CALYX**, the general cup is oval, cylindric, and imbricated, with many blunt, upright, persistent scales. **COROLLA**, compound and radiated, consisting of hermaphrodite florets, placed in the disk, and female ones, which are ligulated, and form the rays. **STAMINA**, of the hermaphrodites, are five short filaments, with cylindric tubulose antheræ. **PISTILLUM**, an oblong aristated germen, with a slender semibifid style, and two erect obtuse stigmas; in the female flowers the germen is oblong and triquetrous, with a capillary style, and two recurved stigmas. **PERICARPIUM**, the calyx containing oblong solitary seeds crowned with down, and placed on a paleaceous receptacle.

Of

Of this genus there are two species.

1. *ZINNIA pauciflora*.

Few-flowered Yellow Zinnia.] The root of this plant is fibrous, from which arises the stalk to about three feet high; it is woody below, and branches upwards, which are placed opposite; these are furnished with oblong leaves of a pleasing green colour; the flowers terminate the ends of the branches on long foot-stalks; they are of a yellow colour, which decays before the seeds are ripe.

2. *ZINNIA multiflora*.

Many-flowered Red Zinnia.] This plant is also annual; the stalk rises erect with upright branches; these are channeled and hairy; the leaves are oval, lanceolate, and placed opposite; the flowers come out at the extreme part of the branches; the florets of the disk are yellow, and those which form the rays are of a dusky red; these continue till the seed is ripe, which is in autumn.

These plants being annual are propagated from the seeds, which should be sown on a slight hot-bed; in March, and afterwards, when the plants arising are a few inches high, they should be pricked out on another bed previously prepared to receive them; here they may remain till the advance of summer, when they may be taken up and transplanted in the borders of the pleasure or flower garden, where they will blow and complete their seeds for the next year.

ZYGOPHYLLUM.

Bean Caper.

It furnishes herbaceous and woody succulent exotics of Asia and Africa, cultivated here for variety in the pleasure ground and green-house collections: rising with erect stalks three or four feet high, adorned with oval, oblong, and spear-shaped, fleshy, succulent leaves, and pentapetalous flowers along the sides of the branches.

Class and order, *Dicandria Monogynia*.

Characters.] CALYX, five oval, obtuse, concave, erect leaves. COROLLA, five obtuse petals emarginated at top, and a ten-leaved closed nectarium, which includes the germen. STAMINA, ten awl-shaped filaments, and oblong incumbent antheræ. PISTILLUM, an oblong germen, awl-shaped style, crowned by a simple stigma. PERICARPium, an oval, pentagonous, quinquevalvulous capsule of five cells, having many roundish seeds.

There are several species; one is herbaceous and moderately hardy, with perennial roots and herbaceous annual stalks; the others are of a woody durable growth, and tender, requiring shelter of the green-house in the win-

ter. The principal sorts in the English gardens are the following.

1. *ZYGOPHYLLUM Fabago*.

(Fabago)—or Common Bean Caper.] Hath a thick, fleshy, deeply striking, perennial root; upright, round, smooth, jointed, herbaceous, green stalks, three or four feet high; garnished with oval, smooth, fleshy, bluish-green leaves, two or three together on each petiole; and reddish flowers, by two or three together at the axillas of the stalks, appearing in July, succeeded by long capsules, containing the seed, ripening in autumn.

It is durable in root; but the stalks, being herbaceous, perish every autumn; is tolerably hardy, only requiring a little shelter in winter when young, afterwards may be planted in the full ground in the borders, in any dry light soil, there finally to remain; where they will abide many years by the root, and send up stalks, and flower abundantly, and ripen seeds.

As it is of a succulent nature, it should have a dry rubbishy soil.

It is propagated by seeds sown in the spring; some in a hot-bed to bring them forward, and some on a warm border; and when the plants are come up about two inches high, plant some out in small pots separately, and plunged into a hot-bed to facilitate their rooting, and forward their growth; but harden them by degrees to the full air; others may be planted in a warm border to take their chance; allowing those in the pots shelter of a garden-frame in frosty weather, and in spring some of them may be turned out into the full ground where they are to remain.

Tender Green-house Kinds.

These are mostly of a shrubby nature, durable in root, stem, and branches, garnished with succulent leaves.

2. *ZYGOPHYLLUM sessilifolium*.

Sessile-leaved African Bean Caper.] Rises with an upright woody stem, branching numerous and irregularly, three or four feet high; oval-spear-shaped, thick, smooth, succulent sessile leaves, surrounding the branches by fours; and yellow flowers on long slender footstalks at the sides of the branches, in succession great part of summer.

Varieties.] Yellow-flowered—Sulphur-coloured flowers—White-flowered—Copper-coloured, having mostly a reddish or brown spot near the base of each petal.

3. *ZYGOPHYLLUM Morgsana*.

Purshian-leaved Ethiopian Bean Caper.] Rises with a shrubby stem, dividing and branching irregularly, three or four feet high; oval, thick, obtuse, succulent leaves, surrounding

ing the branches by fours; and sulphur-coloured flowers on long foot-stalks from the sides of the branches, appearing most part of summer.

Variety.] Flame-yellow-flowered.

4. *ZYGOPHYLLUM spinosum.*

Thorny Bean-Caper.] Under-shrubby stalks; close-sitting leaves with linear acute folioles.

5. *ZYGOPHYLLUM album.*

White Egyptian Bean Caper.] With leaves foot-stalked, and clubbed fleshy lobes.

These tender species of *Zygophyllum* being natives of the warm parts of Africa, they require shelter of a green-house in this country in winter, planting them in pots of light sandy earth, as being succulent, and manage them as other plants of similar quality. See GREEN HOUSE PLANTS.

They are propagated easily by cuttings and by seed.

By Cuttings.—These may be planted, any time in the spring or summer; if in spring

about March or April, plant them in pots; and if plunged in a hot-bed, and occasionally watered, they will quickly emit roots, and shoot at top; and if in the summer months, plant them in a shady place, or in pots placed in the shade, giving frequent waterings, they will also take good root; and in either method pot them off separately towards autumn, in order to be moved into the green-house or glass case, in October.

By Seed.—The plants sometimes produce seeds in this country, or are procured from abroad by the seedsmen; sow them in spring in pots of light earth, and plunge them in a hot-bed, where they will soon come up; and when a little advanced in growth, prick them in separate small pots, watered and plunged again in the hot-bed till well rooted, then hardened gradually to the full air in June and July, to remain till October, then placed in the green-house, &c.



I N D E X

O F T H E G E N E R A,

W I T H T H E I R B O T A N I C A N D E N G L I S H N A M E S.

Containing the Generic Botanic Names in the first Column, and the English Names in the Second, or such Names, either Botanic or English, by which they are most commonly received or known; and as many of the Genera have no English Name, that of the Genus is repeated in the English Column, intimating thereby, that it is the only generally known Name of such respective Genus.

In the second Index are contained the general English, and other common Names of all the principal Plants, Trees, &c, in this Work, whether Species or Genera

And in a third Table is a List of the botanic Titles and Descriptions of the different Parts of Plants, Flowers, Fruits, and Seeds, with their Classes, Orders, and Characters of the Genera and Species, explained in the general course of this Work; and of the different Garden Districts and Compartments; various principal Materials requisite in gardening; with Garden Implements, and Methods of performing the different Works.

Generic Names.	English or common Names.	Generic Names.	English or common Names.
A BROMA -	<i>Abroma.</i>	Aloe -	African Aloe.
Abrus -	Jamaica Wild Liquorice	Alstroemeria -	<i>Alstroemeria.</i>
Acanthus -	{ Acanthus, or Bear's Breech.	Althæa -	Marsh-mallow.
Acer -	Maple Tree.	Alyssum -	Alysson, Madwort.
Achillea -	Milfoil, Yarrow, &c.	Amaranthus -	{ Amaranth, or Flower-Gentle.
Achras -	Sapota Tree.		{ Lily Daffodil, including
Achyranthes -	<i>Achyranthes.</i>	Amaryllis -	Guernsey Lily, Belladonna, and Jacobæa Lily, &c.
Aconitum -	{ Aconite, or Monk's Hood, &c.	Ambrosia -	<i>Ambrosia.</i>
Acorus -	Sweet Rush.	Amellus -	Star Flower.
Actæa -	Herb Christopher.	Amethysta -	<i>Amethysta.</i>
Adansonia -	Æthiopian Sour Gourd.	Amomum -	Ginger.
Adenanthera -	Bastard Flower-Fence.	Amorpha -	Bastard Indigo.
Adiantum -	Maiden Hair.	Amygdalus -	{ Almond Tree, Peach, &c.
Adonis -	Flos Adonis, Bird's Eye.	Amyris -	Sweet Wood.
Adoxa -	Hollow Root.	Anacardium -	Cashew-nut.
Æschynomene -	Bastard Sensitive Plant.	Anagallis -	Pimpernel.
Æsculus -	Horse Chesnut.	Anagyrus -	Stinking Bean-Trefoil.
Agapanthus -	African Lily.	Anastatica -	Rose of Jericho.
Agaricus -	Mushroom.	Anchusa -	Bugloss.
Agave -	American Aloe.	Andrachne -	Base Orpine.
Agrimonia -	Agrimony.	Andromeda -	{ <i>Andromeda</i> , or Marsh-cistus.
Agrostemma -	{ Campion, Rose-Campion.	Anemone -	<i>Anemone</i> , Hepatica, &c.
Ailanthus -	<i>Ailanthus.</i>	Anethum -	Dill, Fennel, &c.
Aitonia -	<i>Aitonia.</i>	Anthemis -	Chamomile, &c.
Ajuga -	Bugle.	Anthericum -	Spider-wort.
Albica -	{ Bastard Star of Bethlehem.	Antholyza -	Æthiopian Corn Flag.
Alcea -	{ Hollyhock, Rose Mal-low.	Anthospermum -	Amber Tree.
Alchemilla -	Lady's Mantle.	Anthyllis -	{ Kidney Vetch, Lady's Finger, Jupiter's Beard, &c.
Aletris -	Guinea Aloe.		Antirrhinum
Allium -	Garlic, Onion, Leek, &c.		

I N D E X.

<i>Generic Names.</i>	<i>English or common Names.</i>	<i>Generic Names.</i>	<i>English or common Names.</i>
Antirrhinum	Snap-Dragon, &c.	Borago	Borage.
Apium	Parsley and Celery.	Borbonia	Borbonia.
Apocynum	Dog's Bane	Bosea	Golden-rod Tree.
Aquilegia	Columbine.	Brassica	{ Cabbage, Cauliflower, Broccoli, &c.
Aralia	Berry-bearing Angelica.	Bromelia	Pine Apple or <i>Ananas</i> .
Arbutus	{ <i>Arbutus</i> or Strawberry tree.	Browallia	<i>Browallia</i> .
Arctotis	<i>Arctotis</i> .	Brunia	Brunia.
Arduina	{ Bastard Lycium, or Cape Buckthorn.	Brunsfelsia	<i>Brunsfelsia</i> .
Areca	Fausel-nut Palm.	Bryonia	Bryony.
Argemone	Prickly Poppy.	Bubon	Macedonian Parsley.
Aristolochia	Birth-wort.	Buchnera	<i>Buchnera</i> .
Arnica	Leopard's Bane.	Buddleja	<i>Buddleja</i> .
Artemisia	{ Mugwort, Wormwood, Southernwood, Tarra- gon, &c.	Bulbocodium	Mountain Saffron.
Artocarpus	Bread Fruit tree.	Buphthalmum	Ox-eye.
Arum	{ Wake Robin, or Cuc- kow Pint.	Bupieurum	{ Hare's Ear, and Shrub- by <i>Æthiopian Hart-</i> wort.
Arundo	Reed.	Butomus	Flowering Rush.
Afarum	Afarabacca.	Buxus	Box Tree.
Asclepias	Swallow-wort.	C.	
Ascyrum	St. Peter's-wort.	Cacalia	{ Foreign or Alpine Colt's Foot.
Aspalathus	African Broom.	Cactus	{ Melon Thistle, Torch Thistle, and Creeping Cereus, &c.
Asparagus	<i>Asparagus</i> .	Calceolaria	Slipper-wort.
Asphodelus	Asphodel Lily.	Calendula	Marigold.
After	Starwort.	Calla	<i>Æthiopian Arum</i> .
Astragalus	{ Milk Vetch, Goat's Thorn.	Caltha	Marsh Marigold.
Astrantia	Black Masterwort.	Callicarpa	Johnsonia.
Athanasia	<i>Athanasia</i> .	Calycanthus	Carolina All-spice.
Atraphaxis	<i>Atraphaxis</i> .	Camellia	Japan Rose.
Atriplex	{ Orach or Orache, Sea Purslane Tree, &c.	Campanula	<i>Campanula</i> or Bell Flower
Atropa	Deadly Nightshade.	Canarina	Canary Bell-Flower.
Aucuba	<i>Aucuba</i> .	Canella	<i>Canella</i> .
Avicennia	<i>Avicennia</i> .	Canna	Indian Flowering Reed.
Azalea	{ American Upright Ho- ney-suckle.	Cannabis	Hemp.
B.		Capparis	Caper Bush.
Baccharis	Ploughman's Spikenard.	Capficum	{ <i>Capficum</i> or Guinea Pep- per.
Banisteria	Banisteria.	Cardamine	Lady's Smock.
Barleria	<i>Barleria</i> .	Carduus	Thistle.
Batella	Malabar Nightshade.	Carica	Papaw Tree.
Bauhinia	Mountain Ebony.	Carpinus	Hornbeam Tree.
Begonia	<i>Begonia</i> .	Carthamus	Bastard Saffron.
Bellis	Daisy.	Carum	Caraway.
Bellonia	<i>Bellonia</i> .	Caryophyllus	Clove Tree.
Berberis	Berberry.	Cassia	Wild Sena.
Beta	Beet.	Cassine	Hottentot Cherry.
Betonica	Betony.	Catananche	Candy Lion's-foot.
Betula	Birch Tree.	Catesbaea	Lily Thorn.
Bignonia	{ Trumpet Flower, Ca- talpa, &c.	Ceanothus	New Jersey Tea.
Bixa	Anotta.	Cedrela	Bastard Cedar.
Blitum	{ Blite, or Strawberry- Spinach.	Celastrus	<i>Celastrus</i> or Staff Tree.
Bocconia	{ <i>Bocconia</i> , or Greater Tree-Celandine.	Celosia	Cock's-comb.
Bombax	Silk-cotton Tree.	Celsia	<i>Celsia</i> .
Bontia	{ <i>Bontia</i> , or Wild Olive of Barbadoes.	Celtis	Lote, or Nettle Tree.
		Centaurea	{ Centaury, Blue-bottle, &c.
		Cephalanthus	Button Tree.
		Cerastium	Mouse-ear Chickweed.
			Ceratonia

I N D E X.

7 T 2

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I N D E X.

<i>Generic Names.</i>	<i>English or common Names.</i>	<i>Generic Names.</i>	<i>English or common Names.</i>
E.			
Ebenus	Ebony.	Gnaphalium	Cudweed, Eternal-flow- er, or Everlasting.
Echinops	Globe Thistle, &c.	Gomphrena	Globe Amaranthus.
Ehretia	<i>Ehretia.</i>	Gordonia	Loblolly-bay.
Elæagnus	Oleaster or Wild Olive.	Gorteria	<i>Gorteria.</i>
Elæocarpus	<i>Elæocarpus.</i>	Gossypium	Cotton Shrub.
Elephantopus	Elephant's Foot.	Grewia	<i>Grewia.</i>
Empetrum	Black-berried Heath.	Guaiacum	Lignum-vitæ.
Ephedra.	Shrubby Horse Tail.	Guettarda	Guettarda.
Epigæa	Trailing Arbutus.	Guilandina	Bonduc or Nickar Tree.
Epilobium	{ Willow-herb or French Willow.	H.	
Epimedium	Barren-wort.	Hæmanthus	Blood-flower.
Erica	Heath.	Hæmatoxylum	Blood-wood.
Erigeron	Erigeron.	Halesia	{ <i>Halesia</i> , or Carolina Snow-drop Tree.
Erioccephalus	<i>Erioccephalus.</i>	Halleria	{ African Fly Honey- suckle.
Erodium	Pentandrious Geranium	Hamamelis	Witch Hazel.
Eryngium	Sea Holly or Eryngo.	Hedera	Ivy Tree or Ivy.
Erysimum	Hedge Mustard, &c.	Hedysarum	{ French Honey-suckle, &c.
Erythrina	Coral Tree.	Helianthus	{ Sun-flower, including Jerusalem artichoke.
Erythronium	Dog's Tooth Violet.	Heliconia	Bastard Plantain.
Euonymus	{ <i>Euonymus</i> , or Spindle Tree.	Helicteres	Screw Tree.
Eupatorium	Hemp Agrimony.	Heliotropium	Heliotrope or Turnsole.
Eugenia	<i>Eugenia.</i>	Helleborus	Hellebore or Bear's Foot
Euphorbia	{ <i>Euphorbia</i> , Spurge, or Burning thorny Plant, &c.	Helonias	<i>Helonias.</i>
F.		Hemerocallis	{ Day Lily or Lily Aspho- del.
Fagara	<i>Fagara.</i>	Hermannia	<i>Hermannia.</i>
Fagus	Beech and Chesnut Tree	Hernandia	Jack in a Box.
Ferraria	<i>Ferraria.</i>	Hesperis	{ Rocket, Dame's Violet, &c.
Ferula	Fennel Giant.	Hibiscus	{ Syrian Mallow, or Al- thæa Frutex, &c.
Ficus	Fig Tree.	Hieracium	Hawk-weed.
Filices	Ferns.	Hippophæ	Sea Buckthorn.
Fothergilla	<i>Fothergilla.</i>	Humulus	Hop.
Fragaria	Strawberry.	Hura	Sand-box Tree.
Fraxinus	Ash Tree.	Hyacinthus	Hyacinth.
Fritillaria	{ Fritillary, including Crown Imperial, and Persian Lily.	Hydrangea	<i>Hydrangea.</i>
Fuchsia	<i>Fuchsia.</i>	Hydrastis	Yellow Root.
Fumaria	Fumatory.	Hymenæa	Locust Tree, &c.
G.		Hypericum	St. John's-wort.
Galanthus	Snow-drop.	Hyssopus	Hyssop.
Garcinia	<i>Garcinia</i> or Mangostan.	I.	
Gardenia	Cape Jasmine.	Jacquinia	<i>Jacquinia.</i>
Genista	Jointed Dwarf Broom.	Jasminum	Jasmine Tree.
Gentiana	Gentian and Gentianella.	Jatropha	Cassava or Cassada.
Geranium	{ <i>Geranium</i> or Crane's Bill, see also <i>Erodium</i> and <i>Pelargonium.</i>	Iberis	Candy Tuft.
Geum	Avens or Herb Bennet.	Ilex	{ Holly or Holly Tree, &c.
Gladiolus	Gladiole or Sword Lily.	Impatiens	{ Touch-me-not, and Bal- samine or Balsam.
Gleditsia	Three-thorned Acacia.	Indigofera	Indigo.
Globularia	Globular Blue Daisy.	Ipomœa	{ Quamoclit or Scarlet Convolvulus.
Gloriosa	Superb Lily.	Iris	{ <i>Iris</i> , Flower-de-Luce, or Flag-flower.
Gloxinia	<i>Gloxinia.</i>	Itea	<i>Itea.</i>
Glycine	{ Knob-rooted Liquorice- vetch, or Carolina Kidney-bean Tree.	Iva	False Jesuit's Bark Tree.
Glycyrrhiza	Liquorice.		Juglans

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<i>Generic Names.</i>	<i>English or common Names.</i>	<i>Generic Names.</i>	<i>English or Common Names.</i>
Juglans	Walnut Tree.	Matricaria	Fever-Few.
Juniperus	{ Juniper-Tree, Cedars, and Savin.	Mauritia	{ Ginkgo, or Maiden- Hair Tree.
Justicia	Malabar Nut.	Medeola	{ Climbing African Aspa- ragus.
Ixia	<i>Ixia.</i>	Medicago	Medick, &c.
Ixora	Indian Wild Jasmine.	Melastoma	American Gooseberry.
K.		Melia	Bead Tree.
Kalmia	<i>Kalmia.</i>	Melianthus	Honey-Flower.
Kæmpferia	Galangale.	Melissa	Balm.
Kiggelaria	<i>Kiggelaria.</i>	Menespermum	Moon-Seed.
L.		Mentha	{ Mint, and Penny-Roy- al.
Lachenalia	<i>Lachenalia.</i>	Mesembryanthemum	{ Fig Marigold, or Fi- coides.
Lactuca	Lettuce.	Mespilus	Medlar, &c.
Lagerstroemia	<i>Lagerstroemia.</i>	Mesua	Indian Rose Chesnut.
Lantana	American Viburnum.	Michella	<i>Michella.</i>
Lathyrus	{ (Chickling Vetch) E- verlasting Pea.	Mimosa	{ <i>Mimosa</i> , or Sensitive Plant, including Aca- cia, &c.
Lavendula	Lavender.	Mimulus	{ Monkey-Flower, or A- merican Fox-Glove.
Lavatera	{ <i>Lavatera</i> , or Cretan and Tree Mallow.	Mirabilis	Marvel of Peru.
Laurus	{ Bay Tree: including Sassafras, and Cinna- mon Tree, &c.	Momordica	Male-Balsam Apple.
Lawsonia	{ <i>Lawsonia</i> or Egyptian Privet.	Monarda	{ Oswego Tea, or Lion's- Tail.
Ledum	{ Marsh Cistus, or Wild Rosemary.	Monsonia	<i>Monsonia.</i>
Lepidium	{ (Dittander,) Garden Cress.	Moræa	<i>Moræa.</i>
Leucojum	Greater Snow Drop.	Morina	<i>Morina.</i>
Ligusticum	Lovage.	Morus	Mulberry Tree.
Ligustrinum	Privet.	Musa	{ Plantain Tree, or Bana- na.
Lilium	Lily.	Musci	{ Mosses, a tribe of im- perfect Plants, of the Class Cryptogamia.
Limodorum	Bastard Hellebore.	Myrica	Candle-Berry Myrtle.
Linum	Lint or Flax.	Myrsine	African Box Tree.
Liquidambar	Sweet Gum Tree.	Myrtus	Myrtle Tree, &c.
Liriodendron	Tulip Tree.	N.	
Lobelia	Cardinal Flower, &c.	Napæa	{ <i>Napæa</i> , or Virginia Mallow.
Lonicera	Honeysuckle.	Narcissus	{ <i>Narcissus</i> , or Daffodil, and Jonquil.
Lopezia	<i>Lopezia.</i>	Nepeta	Nep, or Cat Mint.
Loranthus	<i>Loranthus.</i>	Nerium	Oleander, or Rose Bay.
Lotus	{ Bird's Foot Trefoil, Winged Pea, &c.	Nicotiana	Tobacco Plant.
Lunaria	{ Moon-wort, Satin Flow- er, or Honesty.	Nigella	{ <i>Nigella</i> , Fennel-Flow- er, or Devil-in-a- Bush.
Lupinus	Lupine.	Nolana	<i>Nolana.</i>
Lychnis	{ <i>Lychnis</i> , or Champion, &c.	Nyctanthes	Arabian Jasmine.
Lycium	Box Thorn.	Nymphæa	Water Lily.
Lyfimachia	Loose-strife.	Nyssa	Tupelo Tree.
Lythrum	{ Willow Herb, or Purple Loose-strife.	O.	
M.		Ocymum	Basil or Basilicum.
Magnolia	{ <i>Magnolia</i> , or Laurel- leaved Tulip Tree.	Oenothera	Tree Primrose.
Mahernia	<i>Mahernia.</i>	Olea	Olive Tree.
Malpighia	Barbadoes Cherry.	Oldenlandia	<i>Oldenlandia.</i>
Malva	Mallow.	Ononis	<i>Ononis</i> or Rest Harrow.
Mammea	Mammea Tree.	Ophioxylon	<i>Ophioxylon.</i>
Mangifera	Mango Tree.	Ophrys	{ Twy-Blade, or Bee Flow- er.
Maranta	Indian Arrow-Root.		
Martynia	<i>Martynia</i>		
Massonia	<i>Massonia</i>		

Orchis

I N D E X.

<i>Generic Names.</i>	<i>English or common Names.</i>	<i>Generic Names.</i>	<i>English or common Names.</i>
Orchis	Orchis, (Fool's-Stones).	Poinciana	Barbadoes Flower Fence.
Origanum	Origany, or Marjoram.	Polemonium	Geek Valerian.
Ornithogalum	Star of Bethlehem.	Polyanthes	Tuberose, or Indian Tuberous Hyacinth.
Orobus	Bitter Vetch.	Polygala	Polygala, or Milk-wort.
Osteospermum	Hard-Seeded Chrysanthemum.	Polygonum	Knot Grass, Persicaria, &c.
Osyris	Poet's Cassia.	Populus	Poplar Tree.
Othonna	African Rag-wort.	Portlandia	Portlandia.
Oxalis	Wood-Sorrel.	Portulaca	Purslane.
P.		Portulacaria	Purslane Tree.
Pæonia	Peony.	Potentilla	Cinquefoil.
Panax	Genseng.	Poterium	Garden Burnet.
Pancratium	Pancratium Lily, or Sea Daffodil.	Prasium	Shrubby Hedge Nettle.
Pandanus	Screw Pine.	Primula	Primrose, including Polyanthus and Auricula.
Papaver	Poppy.	Prinos	Winter Berry.
Parkinsonia	Parkinsonia.	Protea	Silver Tree.
Passerina	Sparrow-wort.	Prunus	Plum Tree, including Cherry, Apricot and Laurel.
Passiflora	Passion-Flower.	Psidium	Guava Tree.
Pastinaca	Parfnepe.	Pforalea	Pforalea.
	African Geranium; comprising all the principal shrubby Geranium kinds, formerly ranged under that genus; and several of the herbaceous tribe. See also <i>Erodium</i> and <i>Geranium</i> .	Ptelea	Shrub Trefoil.
Pelargonium		Pulmonaria	Lung-wort.
Penstemon	Bastard Asarum.	Punica	Pomegranate Tree.
Periploca	Virginian or Virgin-Silk, Climbing Dog's Bane.	Pyrus	Pear Tree: comprising also Apple and Quince.
Petiveria	Guinea Hen Weed.	Q.	
Petrea	Petrea.	Quercus	Oak Tree: including also Cork Tree, &c.
Phaseolus	Kidney Bean.	R.	
Philadelphus	Syringa, or Mock Orange.	Randia	Randia.
Phillyrea	Phillyrea, Mock Privet.	Ranunculus	Ranunculus, Crow Foot, &c.
Phlomis	Phlomis, or Jerusalem Sage.	Raphanus	Radish.
Phlox	Lychnidea, or Bastard Lychnis.	Rauvolfia	Rauvolfia.
Phoenix	Great Palm, or Date Tree.	Reseda	Bastard Rocket: including Mignonette.
Phylica	Bastard Alaternus.	Rhamnus	Buckthorn, comprehending Alaternus, &c.
Phyllanthus	Sea Side Laurel.	Rheum	Rhubarb.
Phyllis	Bastard Hare's Ear.	Rhexia	American Soap-wort.
Phytolacca	American Nightshade.	Rhodiola	Rose Root.
Pinus	Pine Tree, Fir, &c.	Rhododendron	Rhododendron, or Dwarf Rose Bay.
Piper	Pepper.	Rhus	Sumach: comprising <i>Toxicodendron</i> or Poison Tree, &c.
Piscidia	Piscidia, or Jamaica Dog-wood Tree.	Ribes	Currant Tree; also Gooseberry.
Pisonia	Fingrigo.	Ricinus	Palma-Christi.
Pistacia	Pistachia Nut, or Turpentine Tree.	Rivinia	Rivinia.
Pisum	Pea.	Robinia	False-Acacia.
Platanus	Plane Tree.	Rondeletia	Rondeletia.
Plinia	Plinia, or Pedunculated Myrtle.	Rosa	Rose, or Rose-Tree; and Sweet Briar.
Plumbago	Lead-wort.	Rosmarinus	Rosemary.
Plumeria	Red Jasmine.	Royenia	African Bladder-Nut.
		Rubia	Madder.

Rubus

I N D E X.

<i>Generic Names.</i>	<i>English or common Names.</i>	<i>Generic Names.</i>	<i>English or common Names.</i>
Rubus	{ Bramble; and Raspber- ry, &c.	Sorbus	{ Service Tree; with Mountain Ash.
Rudbeckia	{ Dwarf American Sun- Flower.	Spartium	Broom.
Rumex	Dock, Sorrel, &c.	Spathelia	Spathelia.
Ruscus	Butcher's Broom, &c.	Spermacoce	Button-Weed.
Ruta	Rue.	Spigelia	Worm-Grass.
		Spinacia	Spinach
S.		Spiræa	Spiræa-Frutex, &c.
Saccharum	Sugar-Cane.	Spondias	Brasilian Plum, &c.
Salix	{ Sallow, or Willow- Tree.	Stapelia	Stapelia.
Salsola	Glass-Wort.	Staphylæa	Bladder-Nut.
Salvia	{ Sage; including Clary, &c.	Statice	Thrift or Sea Pink.
Sambucus	Elder-Tree	Stewartia	Stewartia
Sanguinaria	Puccoon.	Strelitzia	Strelitzia.
Santolina	Lavender-Cotton.	Styrax	{ Storax or Sweet-Gum Tree.
Sapindus	Soap-berry Tree.	Swietenia	Mahogany Tree.
Sarracena	Side-saddle-Flower.	Symphytum	Comfrey, or Comphrey.
Satureia	Savory.	Syringa	Lilac.
Satyrion	{ Satyrion, or Lizard- Flower.	T.	
Saxifraga	Saxifrage.	Tabernæmontana	Tabernæmontana.
Scabiosa	Scabius or Scabious.	Tagetes	{ African and French Marigold.
Scandix	{ Shepherd's Needle, Gar- den Chervil.	Tamarindus	Tamarind Tree.
Schinus	Indian Mastic Tree.	Tamarix	Tamarisk Tree.
Schotia	Schotia.	Tamus	Black Bryony.
Scilla	Squill, or Sea Onion.	Tanacetum	Tansy, &c.
Scorpiurus	{ Caterpillar, or Caterpil- lar-Plant.	Tarchonanthus	{ Shrubby African Flea- Bane.
Scorzonera	Scorzonera, Viper's Grass.	Taxus	Yew Tree.
Scrophularia	Fig-wort.	Telephium	True Orpine.
Scutellaria	Skull-cap.	Tetragonia	Tetragonia.
Sedum	{ Sedum, or Lesser House- leek, including Stone- crop, &c.	Teucrium	{ Tree Germander; in- cluding Polium, and Marum, &c.
Selago	Selago.	Thalictrum	Meadow Rue.
Sempervivum	{ Greater or Common House-leek; Tree Sedum, &c.	Thea	Tea Tree.
Senecio	Groundsel, &c.	Theobroma	Chocolate-Nut Tree.
Serratula	Saw-wort.	Thuya	Arbor Vitæ.
Sida	Indian Mallow.	Thymbra	Mountain Hyssop.
Sideritis	Iron-wort.	Thymus	Thyme.
Sideroxylon	Iron-wood.	Tilia	Lime Tree.
Silene	Viscous Campion. &c.	Tinus	Tree Volkameria.
Silphium	{ Bastard Chrysanthe- mum.	Toluifera	Balsam of Tolu Tree.
Sinapis	Mustard.	Tournefortia	Tournefortia.
Sisymbrium	Water-cress.	Trachelium	Throat-wort.
Sisyrinchium	Bermudiana.	Tradescantia	Virginia Spider-wort.
Sium	{ Water Parsnep; and Skirret.	Tragopogon	{ Goat's-Beard; including Salsify, &c.
Smilax	{ Smilax, or Rough-Bind- weed, &c.	Trichomanes	Maiden-Hair Fern.
Smyrniun	Alexanders.	Trifolium	Trefoil, or Clover.
Solanum	{ Nightshade; including Egg-plant, Love-ap- ple and Potatoe, &c.	Trillium	{ Herb True-Love of Canada.
Solidago	Golden Rod.	Triopteris	Triopteris.
Sophora	Sophora.	Triticum	Wheat.
		Triumfetta	Triumfetta.
		Trollius	Globe Ranunculus.
		Tropæolum	{ Indian Cress or Nastur- tium.
		Tulbagia	Tulbagia.
		Tulipa	Tulip.
		Turnera	Turnera.
		Tussilago	Colt's Foot.

I N D E X.

<i>Generic Names.</i>	<i>English or common Names.</i>	<i>Generic Names.</i>	<i>English or common Names.</i>
U.		Viscum	Mistletoe.
Ulex	Furz, Gorse, or Whins.	Vitex	Agnus Custus; or Chaste Tree.
Ulmus	Elm Tree.	Vitis	Vine.
Urena	Indian Mallow.	Volkameria	Volkameria.
Urtica	Nettle.	W.	
V.		Wackendorfia	Wackendorfia.
Vaccinium	Whortle-Berry.	Winterana	Winterana, or Winter's Bark.
Valeriana	Valerian.	X.	
Veratrum	White Hellebore.	Xeranthemum	Eternal Flower.
Verbascum	Mullein.	Xylophylla	Love Flower.
Verbena	Vervain.	Y.	
Verbesina	Indian Hemp-Agrimony	Yucca	Adam's Needle.
Veronica	Veronica, or Speedwell.	Z.	
Viburnum	Wayfaring Tree; including the Guelder Rose, and Laurustinus.	Zamia	Dwarf Pennated Palm.
Vicia	Vetch; and Garden Bean.	Zanthoxylum	Tooth-Ach Tree.
Vinca	Periwinkle.	Zea	Mays, or Indian Corn, or Turkey Wheat.
Viola	Violet; including Pansy or Heart's Ease.	Zinnia	Zinnia.
		Zygophyllum	Bean-Caper.



I N D E X

I N D E X

OF THE

ENGLISH AND MOST COMMON NAMES OF THE PLANTS.

Containing the general English Names, and such others, whether English or Latin, as are the most generally known and received, both of the Genera and of all the principal or most remarkable Species, arranged in the first column; and in the second are the names or titles of the Genera to which they respectively belong, and under which they are arranged in the foregoing work, according to the Linnæan System of Botany.

<i>English Names.</i>	<i>Botanic Names.</i>	<i>English Names.</i>	<i>Botanic Names.</i>
A BELE tree - -	<i>Populus.</i>	Amellus of Virgil -	<i>Aster.</i>
Acacia - -	<i>Mimosa.</i>	Amomum Plinii -	<i>Solanum.</i>
Acacia, false - -	<i>Robinia.</i>	Ananas - -	<i>Bromelia.</i>
Acacia, scarlet - -	<i>Robinia.</i>	Ananas, wild - -	<i>Bromelia.</i>
Acacia, three-thorned	<i>Gleditsia.</i>	Andrachne - -	<i>Arbutus.</i>
Acajou - -	<i>Anacardium.</i>	Andromeda - -	<i>Andromeda.</i>
Aconite - -	<i>Aconitum.</i>	Anemone - -	<i>Anemone.</i>
Aconite, winter - -	<i>Helleborus.</i>	Anemone, wood - -	<i>Anemone.</i>
Adam's needle - -	<i>Yucca.</i>	Angelica - -	<i>Angelica.</i>
Adder's wort - -	<i>Polygonum.</i>	Angelica, berry-bearing	<i>Aralia.</i>
African marigold - -	<i>Tagetes.</i>	Angelica tree - -	<i>Aralia.</i>
Agaric - -	<i>Agaricus.</i>	Anotta - -	<i>Bixa.</i>
Agnus-castus - -	<i>Vitex.</i>	Apple tree - -	<i>Pyrus.</i>
Agrimony - -	<i>Agrimonia.</i>	Apple, custard - -	<i>Annona.</i>
Agrimony, hemp - -	<i>Eupatorium.</i>	Apple, love - -	<i>Solanum.</i>
Agrimony, Indian hemp	<i>Verbena.</i>	Apple, mad - -	<i>Solanum.</i>
Alaternus - -	<i>Rhamnus.</i>	Apple, male balsam -	<i>Momordica.</i>
Alaternus, bastard -	<i>Phytica.</i>	Apple, pine - -	<i>Bromelia.</i>
Alder tree - -	<i>Betula.</i>	Apple, soap - -	<i>Sapindus.</i>
Alder, berry-bearing -	<i>Rhamnus.</i>	Apple, star - -	<i>Chrysophyllum.</i>
Ale-cost, or costmary	<i>Tanacetum.</i>	Apple, sweet - -	<i>Annona.</i>
Alexanders - -	<i>Smyrnum.</i>	Apple, thorn - -	<i>Datura.</i>
Alkekengi - -	<i>Physalis.</i>	Apple, water - -	<i>Annona.</i>
All-spice - -	<i>Myrtus.</i>	Apricot tree - -	<i>Prunus.</i>
All-spice, Carolina -	<i>Calycanthus.</i>	Arbor vitæ - -	<i>Thuja.</i>
Alligator pear - -	<i>Laurus.</i>	Arbutus - -	<i>Arbutus.</i>
Almond tree - -	<i>Amygdalus.</i>	Arbutus, dwarf - -	<i>Arbutus.</i>
Aloe, American - -	<i>Agave.</i>	Arbutus, trailing -	<i>Epigæa.</i>
Aloe, African - -	<i>Aloe.</i>	Arrow-root - -	<i>Maranta.</i>
Althæa frutex - -	<i>Hibiscus.</i>	Arse-smart - -	<i>Polygonum.</i>
Alysson - -	<i>Alyssum.</i>	Artichoke - -	<i>Cynara.</i>
Amaranth - -	<i>Amaranthus.</i>	Artichoke, Jerusalem	<i>Helianthus.</i>
Amaranthus, globe -	<i>Gomphrena.</i>	Arum, African - -	<i>Calla.</i>
Amaranthus, tree - -	<i>Amaranthus.</i>	Asarabacca - -	<i>Asarum.</i>
Amber tree - -	<i>Anthospermum.</i>	Ash-tree - -	<i>Fraxinus.</i>
Amelanchier - -	<i>Mespilus.</i>	Ash, mountain - -	<i>Sorbus.</i>

<i>English Names.</i>	<i>Botanic Names.</i>	<i>English Names.</i>	<i>Botanic Names.</i>
Ash, poison	- <i>Rhus.</i>	Bell flower	- <i>Campanula.</i>
Asparagus	- <i>Asparagus.</i>	Bell flower, Canary	- <i>Canarina.</i>
Asparagus, climbing	} <i>Medeola.</i>	Bell flower, steeple	- <i>Campanula.</i>
African,		Bells, Canterbury	- <i>Campanula.</i>
Aspen tree	- <i>Populus.</i>	Bells, hair	- <i>Hyacinthus.</i>
Asphodel	- <i>Asphodelus.</i>	Bell-pepper	- <i>Capicum.</i>
Asphodel, African	- <i>Anthericum.</i>	Belladonna lily	- <i>Amaryllis.</i>
Asphodel lily	- <i>Crinum.</i>	Belvedere	- <i>Chenopodium.</i>
Asphodel lily	- <i>Hemerocallis.</i>	Benjamin tree	- <i>Laurus.</i>
Atamafco lily	- <i>Amaryllis.</i>	Bennet, herb	- <i>Geum.</i>
Avens	- <i>Geum.</i>	Berberry	- <i>Berberis.</i>
Avogato pear	- <i>Laurus.</i>	Bermudiana	- <i>Sisyrinchium.</i>
Auricula	- <i>Primula.</i>	Betony	- <i>Betonica.</i>
Azarole	- <i>Crategus.</i>	Betony, Paul's	- <i>Veronica.</i>
B.		Bilberry	- <i>Vaccinium.</i>
Balm	- <i>Melissa.</i>	Bind-weed	- <i>Convolvulus.</i>
Balm of Gilead	- <i>Dracocephalum.</i>	Bind-weed, rough	- <i>Smilax.</i>
Balm, Moldavian	- <i>Dracocephalum.</i>	Bind-weed, black	- <i>Tamus.</i>
Balm of Gilead fir	- <i>Pinus.</i>	Birch tree	- <i>Betula.</i>
Balsam or Balsamine	- <i>Impatiens.</i>	Bird cherry	- <i>Prunus.</i>
Balsam apple, male	- <i>Momordica.</i>	Bird-pepper	- <i>Capicum.</i>
Balsam of Tolu	- <i>Toluisera.</i>	Bird's eye	- <i>Adonis.</i>
Balsam tree	- <i>Clusia.</i>	Bird's foot, trefoil	- <i>Lotus.</i>
Balsam tree	- <i>Pistacia.</i>	Bird's nest	- <i>Ophrys.</i>
Balsam of Gilead tree	- <i>Amyris.</i>	Bird's nest, purple	- <i>Orchis.</i>
Balsam of Capivi tree	- <i>Copaifera.</i>	Bird's service	- <i>Sorbus.</i>
Balsam of Mecca tree	- <i>Amyris.</i>	Birthwort	- <i>Aristolochia.</i>
Balsamine, female	- <i>Impatiens.</i>	Bistort	- <i>Polygonum.</i>
Bamboo cane	- <i>Arundo.</i>	Bitter vetch	- <i>Orobis.</i>
Banana tree	- <i>Musa.</i>	Bitter wort	- <i>Gentiana.</i>
Bane-berries	- <i>Africa.</i>	Blackberry	- <i>Rubus.</i>
Barba Jovis	- <i>Anthyllis.</i>	Blackthorn	- <i>Prunus.</i>
Bark, true Jesuit's	- <i>Cinchona.</i>	Bladder-nut	- <i>Staphylæa.</i>
Bark, false Jesuit's	- <i>Iva.</i>	Bladder-nut, African	- <i>Royena.</i>
Bark, Winter's	- <i>Wintera.</i>	Bladder fena	- <i>Colutea.</i>
Barren wort	- <i>Epimedium.</i>	Bladder fena, jointed	} <i>Coronilla.</i>
Base trefoil tree	- <i>Cytisus.</i>	podded	
Basil	- <i>Ocimum.</i>	Blea-berry	- <i>Vaccinium.</i>
Batchelor's button	- <i>Lychnis.</i>	Blite	- <i>Blitum.</i>
Bay tree	- <i>Laurus.</i>	Blood-flower	- <i>Hemantibus.</i>
Bay, loblolly	- <i>Gordonia.</i>	Blood-wood	- <i>Hæmatoxylum.</i>
Bay, rose	- <i>Nerium.</i>	Blood-wort	- <i>Rumex.</i>
Bay, dwarf rose	- <i>Rhododendron.</i>	Bloody-dock	- <i>Rumex.</i>
Bay plum	- <i>Psidium.</i>	Blue-bottle	- <i>Centaurea.</i>
Bead tree	- <i>Melia.</i>	Bonduc tree	- <i>Guilandina.</i>
Bean, common	- <i>Vicia.</i>	Borecole	- <i>Brassica.</i>
Bean, kidney	- <i>Phaseolus.</i>	Borage	- <i>Borago.</i>
Bean tree, kidney	- <i>Glycine.</i>	Bottle-flower	- <i>Centaurea.</i>
Bean caper	- <i>Zygophyllum.</i>	Box tree	- <i>Buxus.</i>
Bean trefoil, stinking	- <i>Anagyris.</i>	Box tree, African	- <i>Myrsine.</i>
Bearberries	- <i>Arbutus.</i>	Box-thorn	- <i>Lycium.</i>
Bearbind	- <i>Convolvulus.</i>	Box-thorn, Ethiopian	- <i>Celastrus.</i>
Bear's breech	- <i>Acanthus.</i>	Bramble	- <i>Rubus.</i>
Bear's ear	- <i>Primula.</i>	Brank	- <i>Polygonum.</i>
Bear's ear, fanicle	- <i>Cortusa.</i>	Brank ursine	- <i>Acanthus.</i>
Bear's foot	- <i>Helleborus.</i>	Bread-fruit tree	- <i>Artocarpus.</i>
Beard, old-man's	- <i>Clematis.</i>	Break-stone	- <i>Saxifraga.</i>
Beard, Jupiter's	- <i>Anthyllis.</i>	Briar, sweet	- <i>Rosa.</i>
Bee flower	- <i>Ophrys.</i>	Briar, wild	- <i>Rosa.</i>
Bee larkspur	- <i>Delphinium.</i>	Broccoli	- <i>Brassica.</i>
Beech tree	- <i>Fagus.</i>	Broom	- <i>Spartium.</i>
Bect	- <i>Beta.</i>	Broom, African	- <i>Aspalathus.</i>

Broom,

I N D E X.

<i>English Names.</i>	<i>Botanic Names.</i>	<i>English Names.</i>	<i>Botanic Names.</i>
Broom, dyer's	- <i>Genista.</i>	Catchfly, Lobel's	- <i>Silene.</i>
Broom, dwarf	- <i>Genista.</i>	Catchfly, German	- <i>Lychnis.</i>
Broom, Spanish	- <i>Spartium.</i>	Caterpillar plant	- <i>Scorpiurus.</i>
Broom, butcher's	- <i>Ruscus.</i>	Caterpillar trefoil	- <i>Medicago.</i>
Bryony	- <i>Bryonia.</i>	Cat-mint	- <i>Nepeta.</i>
Bryony, black	- <i>Tamus.</i>	Cauliflower	- <i>Brassica.</i>
Buckthorn	- <i>Rhamnus.</i>	Cedar	- <i>Juniperus.</i>
Buckthorn, sea	- <i>Hippophae.</i>	Cedar of Jamaica, bastard	- <i>Theobroma.</i>
Buckwheat	- <i>Polygonum.</i>	Cedar, Bermudas	- <i>Juniperus.</i>
Bugle	- <i>Ajuga.</i>	Cedar, red	- <i>Cupressus.</i>
Bugloss	- <i>Anchusa.</i>	Cedar, Goa	- <i>Juniperus.</i>
Bullace tree	- <i>Prunus.</i>	Cedar, white	- <i>Cupressus.</i>
Burnet, garden	- <i>Poterium.</i>	Cedar of Libanus	- <i>Pinus.</i>
Burning thorny plant	- <i>Euphorbia.</i>	Cedar, deciduous	- <i>Pinus.</i>
Butcher's broom	- <i>Ruscus.</i>	Celandine	- <i>Chelidonium.</i>
Butter-burr	- <i>Tussilago.</i>	Celandine, tree	- <i>Bocconia.</i>
Button tree	- <i>Cephalanthus.</i>	Celeriac	- <i>Apium.</i>
Button weed	- <i>Spermacoce.</i>	Celery	- <i>Apium.</i>
C.		Centaury	- <i>Centaurea.</i>
Cabbage	- <i>Brassica.</i>	Cereus	- <i>Cactus.</i>
Cabbage, sea	- <i>Crambe.</i>	Cereus, creeping	- <i>Cactus.</i>
Cabbage, turnep	- <i>Brassica.</i>	Cereus, night-flowering	- <i>Cactus.</i>
Cabbage tree	- <i>Areca.</i>	Chamomile	- <i>Anthemis.</i>
Cabbage tree	- <i>Cacalia.</i>	Chardon (cardoon)	- <i>Cynara.</i>
Calabash	- <i>Cucurbita.</i>	Chaste tree	- <i>Vitex.</i>
Calabash tree	- <i>Crescentia.</i>	Cherry tree	- <i>Prunus.</i>
Calamint	- <i>Melissa.</i>	Cherry, Barbadoes	- <i>Malpighia.</i>
Calamint, water	- <i>Mentha.</i>	Cherry, bird	- <i>Prunus.</i>
Calves snout	- <i>Antirrhinum.</i>	Cherry, cornelian	- <i>Cornus.</i>
Campeachy wood	- <i>Hematoxylum.</i>	Cherry, dwarf	- <i>Lonicera.</i>
Camphor tree	- <i>Laurus.</i>	Cherry, double-blossom	- <i>Prunus.</i>
Campion, rose	- <i>Agrostemma.</i>	Cherry, Hottentot	- <i>Cassia.</i>
Campion	- <i>Lychnis.</i>	Cherry, perfumed	- <i>Prunus.</i>
Campion, viscous	- <i>Silene.</i>	Cherry laurel	- <i>Prunus.</i>
Canary bell-flower	- <i>Canarina.</i>	Cherry, weeping	- <i>Prunus.</i>
Candle-berry myrtle	- <i>Myrica.</i>	Cherry, winter	- <i>Physalis.</i>
Candy lion's-foot	- <i>Catananche.</i>	Cherry, winter	- <i>Solanum.</i>
Candy-tuft	- <i>Iberis.</i>	Cherry plum	- <i>Prunus.</i>
Candy-tuft tree	- <i>Iberis.</i>	Chervil, garden	- <i>Scandix.</i>
Cane reed	- <i>Arundo.</i>	Chervil, great perennial	- <i>Scandix.</i>
Cane, sugar	- <i>Saccharum.</i>	Chestnut-tree	- <i>Fagus.</i>
Canterbury bells	- <i>Campanula.</i>	Chestnut, horse	- <i>Esculus.</i>
Caper bush	- <i>Capparis.</i>	Chestnut, Indian rose	- <i>Mesua.</i>
Caper, bean	- <i>Zygophyllum.</i>	China-after	- <i>Aster.</i>
Caraway	- <i>Carum.</i>	China root	- <i>Smilax.</i>
Caragana	- <i>Robinia.</i>	China rose	- <i>Hibiscus.</i>
Cardinal flower	- <i>Lobelia.</i>	Chinquapin	- <i>Fagus.</i>
Cardoon	- <i>Cynara.</i>	Chocolate nut	- <i>Theobroma.</i>
Carnation	- <i>Dianthus.</i>	Christmas rose	- <i>Helleborus.</i>
Carnation, Spanish	- <i>Poinciana.</i>	Christopher, herb	- <i>Aleæa.</i>
Carnation tree	- <i>Cacalia.</i>	Christ's thorn	- <i>Rhamnus.</i>
Carob tree	- <i>Ceratonia.</i>	Chrysanthemum	- <i>Chrysanthemum.</i>
Carrot	- <i>Daucus.</i>	Chrysanthemum, bastard	- <i>Silphium.</i>
Carui	- <i>Carum.</i>	Chrysanthemum, hard- seeded	- <i>Osteospermum.</i>
Cashew nut	- <i>Anacardium.</i>	Ciboules	- <i>Allium.</i>
Cassava	- <i>Jatropha.</i>	Cicely, sweet	- <i>Scandix.</i>
Cassia, poet's	- <i>Osyris.</i>	Cinnamon tree	- <i>Laurus.</i>
Cassidony	- <i>Gnaphalium.</i>	Cinnamon, bastard	- <i>Wintera.</i>
Cassioberry bush	- <i>Viburnum.</i>	Cinquefoil	- <i>Potentilla.</i>
Catalpa	- <i>Bignonia.</i>	Cinquefoil, shrub	- <i>Potentilla.</i>
Catchfly	- <i>Lychnis.</i>		

I N D E X.

<i>English Names.</i>	<i>Botanic Names.</i>	<i>English Names.</i>	<i>Botanic Names.</i>
Cistus (Rock-rose)	- <i>Cistus.</i>	Crocus, spring	- <i>Crocus.</i>
Cistus, marsh	- <i>Ledum.</i>	Crocus, autumn	- <i>Crocus.</i>
Cistus, lesser marsh	- <i>Andromeda.</i>	Crocus, saffron	- <i>Crocus.</i>
Citron tree	- <i>Citrus.</i>	Cross-wort	- <i>Valantia.</i>
Citrus	- <i>Cucurbita.</i>	Crowberries	- <i>Empetrum.</i>
Cives	- <i>Allium.</i>	Crowfoot	- <i>Ranunculus.</i>
Clary	- <i>Salvia.</i>	Crown imperial	- <i>Fritillaria.</i>
Climber	- <i>Clematis.</i>	Cuckow-flower	- <i>Cardamine.</i>
Climber	- <i>Smilax.</i>	Cuckow-pint	- <i>Arum.</i>
Cloud-berry	- <i>Rubus.</i>	Cucumber	- <i>Cucumis.</i>
Clove gilliflower	- <i>Dianthus.</i>	Cucumber, spirting	- <i>Momordica.</i>
Clove tree	- <i>Caryophyllus.</i>	Cudweed	- <i>Gnaphalium.</i>
Clover	- <i>Trifolium.</i>	Currant tree	- <i>Ribes.</i>
Cob-nut	- <i>Corylus.</i>	Cushion, lady's	- <i>Saxifraga.</i>
Cock's-comb	- <i>Celofia.</i>	Custard apple	- <i>Annona.</i>
Cock's-spur thorn	- <i>Crataegus.</i>	Cypress tree	- <i>Cupressus.</i>
Cocoa-nut tree	- <i>Cocos.</i>	Cypress, summer	- <i>Chenopodium.</i>
Cocoa plum	- <i>Chrysobalanus.</i>	D.	
Codlin tree	- <i>Pyrus.</i>	Daffodil	- <i>Narcissus.</i>
Coffee tree	- <i>Coffea.</i>	Daffodil, lily	- <i>Amaryllis.</i>
Colchicum, or meadow	} <i>Colchicum.</i>	Daffodil, lily	- <i>Pancratium.</i>
saffron		Daffodil, sea	- <i>Pancratium.</i>
Cole seed	- <i>Brassica.</i>	Dahoon holly	- <i>Ilex.</i>
Colewort	- <i>Brassica.</i>	Daisy	- <i>Bellis.</i>
Colewort, sea	- <i>Crambe.</i>	Daisy, blue	- <i>Globularia.</i>
Colt's-foot	- <i>Tussilago.</i>	Daisy, globe	- <i>Globularia.</i>
Colt's-foot, Alpine	- <i>Cacalia.</i>	Daisy, ox-eye	- <i>Chrysanthemum.</i>
Columbine	- <i>Aquilegia.</i>	Daisy, Michaelmas	- <i>Aster.</i>
Columbine, feathered	- <i>Thalictrum.</i>	Dame's violet	- <i>Hesperis.</i>
Colutea, jointed-podded	- <i>Coronilla.</i>	Damson tree, common	- <i>Prunus.</i>
Comfrey	- <i>Symphytum.</i>	Damson tree	- <i>Chrysophyllum.</i>
Conval lily	- <i>Convallaria.</i>	Date tree	- <i>Phoenix.</i>
Convolvulus	- <i>Convolvulus.</i>	Date plum, India	- <i>Diospyros.</i>
Convolvulus, scarlet	- <i>Ipomœa.</i>	Day lily	- <i>Hemerocallis.</i>
Coral-tree	- <i>Erythrina.</i>	Deadly nightshade	- <i>Atropa.</i>
Coriander	- <i>Coriandrum.</i>	Devil in a bush	- <i>Nigella.</i>
Cork tree	- <i>Quercus.</i>	Devil's bit	- <i>Scabiosa.</i>
Corn, Indian	- <i>Zea.</i>	Dewberry bush	- <i>Rubus.</i>
Corn-flag	- <i>Gladiolus.</i>	Dill	- <i>Anethum.</i>
Corn-marigold	- <i>Chrysanthemum.</i>	Distaff thistle	- <i>Carthamus.</i>
Corn-rose	- <i>Papaver.</i>	Dittany	- <i>Origanum.</i>
Corn-sallad	- <i>Valeriana.</i>	Dittany, white	- <i>Dictamnus.</i>
Corn-bottle	- <i>Centaurea.</i>	Dock	- <i>Rumex.</i>
Cornel tree	- <i>Cornus.</i>	Dock, bloody	- <i>Rumex.</i>
Cornelian cherry	- <i>Cornus.</i>	Dog's-bane	- <i>Asclepias.</i>
Costmary	- <i>Tanacetum.</i>	Dog's-bane	- <i>Apocynum.</i>
Cotton	- <i>Gossypium.</i>	Dog-berry	- <i>Cornus.</i>
Cotton, lavender	- <i>Santolina.</i>	Dog's-stones	- <i>Orchis.</i>
Cotton tree, silk	- <i>Bombax.</i>	Dog's-tooth, violet	- <i>Erythronium.</i>
Courbaril	- <i>Hymenœa.</i>	Dog-rose	- <i>Rosa.</i>
Cowslip	- <i>Primula.</i>	Dog-wood	- <i>Cornus.</i>
Cowslip, American	- <i>Dodecatheon.</i>	Dog-wood, Jamaica	- <i>Erythrina.</i>
Crab-tree	- <i>Pyrus.</i>	Dragons	- <i>Arum.</i>
Crab, Siberian	- <i>Pyrus.</i>	Dragons	- <i>Dracontium.</i>
Cranberries	- <i>Vaccinium.</i>	Dragon's head	- <i>Dracocephalum.</i>
Crane's bill	- <i>Geranium.</i>	Dragon tree	- <i>Dracœna.</i>
Crane's bill pentandrous	- <i>Erodium.</i>	Dragon, snap	- <i>Antirrhinum.</i>
Crane's bill, shrubby	} <i>P. largonium.</i>	Dropwort	- <i>Spirœa.</i>
African		Dyer's broom	- <i>Genista.</i>
Creeper, Virginian	- <i>Hedera.</i>	Dyer's weed	- <i>Genista.</i>
Cress, garden	- <i>Lepidium.</i>	Dyer's weed	- <i>Reseda.</i>
Cress, Indian	- <i>Tropœolum.</i>	E.	
Cress, water	- <i>Sisymbrium.</i>	Ebony	- <i>Ebenus.</i>

Ebony.

I N D E X

<i>English Names.</i>	<i>Botanic Names.</i>	<i>English Names.</i>	<i>Botanic Names.</i>
Ebony, mountain	- <i>Baobab.</i>	Four o'clock flower	- <i>Mirabilis.</i>
Ebony, false	- <i>Poinciana.</i>	Fox glove	- <i>Digitalis.</i>
Egg-plant	- <i>Solanum.</i>	Fox glove, false	- <i>Minulus.</i>
Eglantine	- <i>Rosa.</i>	Frankincense tree	- <i>Pinus.</i>
Elder tree	- <i>Sambucus.</i>	Frankincense, Jew's	- <i>Styrax.</i>
Elder, dwarf	- <i>Sambucus.</i>	Fraxinella	- <i>DiStamnus.</i>
Elder, marsh	- <i>Viburnum.</i>	French, or kidney bean	- <i>Phaseolus.</i>
Elemi tree, gum	- <i>Pistacia.</i>	French honeysuckle	- <i>Hedysarum.</i>
Elemi, gum	- <i>Amyris.</i>	French marigold	- <i>Tagetes.</i>
Elephant's foot	- <i>Elephantopus.</i>	French willow	- <i>Epilobium.</i>
Elm tree	- <i>Ulmus.</i>	Friar's cowl	- <i>Arum.</i>
Endive	- <i>Cichorium.</i>	Fringe tree	- <i>Chionanthus.</i>
Eryngo	- <i>Eryngium.</i>	Fritillary	- <i>Fritillaria.</i>
Eschalot	- <i>Allium.</i>	Fritillary, crassa minor	- <i>Stapelia.</i>
Eternal flower	- <i>Xeranthemum.</i>	Fritillary-crassa major	- <i>Stapelia.</i>
Eternal flower	- <i>Gnaphalium.</i>	Fumatory	- <i>Fumaria.</i>
Eternal flower	- <i>Gomphrena.</i>	Furze	- <i>Ulex.</i>
Evergreen oak	- <i>Quercus.</i>	G.	
Everlasting flower	- <i>Gnaphalium.</i>	Gale, or sweet willow	- <i>Myrica.</i>
Everlasting flower	- <i>Xeranthemum.</i>	Galangale	- <i>Kempferia.</i>
Everlasting flower	- <i>Gomphrena.</i>	Galangale	- <i>Maranta.</i>
Euonymus	- <i>Euonymus.</i>	Galbanum	- <i>Bubon.</i>
Euonymus, bastard	- <i>Celastrus.</i>	Garlick	- <i>Allium.</i>
Euonymus, climbing	- <i>Celastrus.</i>	Garlick pear	- <i>Crataeva.</i>
F.		Gelder rose—see Guelder	} <i>Viburnum.</i>
Faufel nut	- <i>Arca.</i>	rose	
Feather, prince's	- <i>Amaranthus.</i>	Gentian	- <i>Gentiana.</i>
Feathered columbine	- <i>Thalictrum.</i>	Gentianella	- <i>Gentiana.</i>
Felwort	- <i>Gentiana.</i>	Genseng	- <i>Panax.</i>
Fennel	- <i>Anethum.</i>	Gentle, flower	- <i>Amaranthus.</i>
Fennel, sea	- <i>Critbnum.</i>	Germander	- <i>Teucrium.</i>
Fennel flower	- <i>Nigella.</i>	Germander, tree	- <i>Teucrium.</i>
Fennel-giant	- <i>Ferula.</i>	Germander, water	- <i>Teucrium.</i>
Feverfew	- <i>Matricaria.</i>	Gilead, balm of	- <i>Dracocephalum.</i>
Ficoides	- <i>Mesembryanthemum.</i>	Gilliflower	- <i>Dianthus.</i>
Fiddle wood	- <i>Citharexylum.</i>	Gilliflower, clove	- <i>Dianthus.</i>
Fig tree	- <i>Ficus.</i>	Gilliflower, queen's	- <i>Hesperis.</i>
Fig, Indian	- <i>Cactus.</i>	Gilliflower, stock	- <i>Chiranthus.</i>
Fig, cochineal	- <i>Cactus.</i>	Ginger	- <i>Amomum.</i>
Fig marigold	- <i>Mesembryanthemum.</i>	Ginkgo	- <i>Mauritia.</i>
Figwort	- <i>Scrophularia.</i>	Gladiole	- <i>Gladiolus.</i>
Filbert tree	- <i>Corylus.</i>	Gladiole, water	- <i>Butomus.</i>
Filipendula	- <i>Spiraea.</i>	Gladwin, stinking	- <i>Iris.</i>
Fingrigo	- <i>Pisonia.</i>	Glastonbury thorn	- <i>Crataegus.</i>
Finochio	- <i>Anethum.</i>	Glass-wort	- <i>Saljola.</i>
Fir tree	- <i>Pinus.</i>	Globe amaranthus	- <i>Gomphrena.</i>
Flag, or flag flower	- <i>Iris.</i>	Globe daisy	- <i>Globularia.</i>
Flag, corn	- <i>Gladiolus.</i>	Globe ranunculus	- <i>Trollius.</i>
Flag, sweet-scented	- <i>Acorus.</i>	Globe thistle	- <i>Echinops.</i>
Flax	- <i>Linum.</i>	Goat's beard	- <i>Tragopogon.</i>
Flax, toad	- <i>Antirrhinum.</i>	Goat's thorn	- <i>Astragalus.</i>
Fleabane	- <i>Conyza.</i>	Golden mouse-ear	- <i>Hieracium.</i>
Fleabane, shrubby African	- <i>Tarconanthus.</i>	Golden rod	- <i>Solidago.</i>
Flower gentle	- <i>Amaranthus.</i>	Golden rod tree	- <i>Bosa.</i>
Flower of an hour	- <i>Hibiscus.</i>	Golden saxifrage	- <i>Chrysosplenium.</i>
Flower de luce	- <i>Iris.</i>	Goldy locks	- <i>Chrysocoma.</i>
Flower fence, Barbadoes	- <i>Poinciana.</i>	Goldy locks	- <i>Gnaphalium.</i>
Flower fence, false	- <i>Adenantha.</i>	Good Henry	- <i>Chenopodium.</i>
Fly honeysuckle	- <i>Lonicera.</i>	Gooseberry tree	- <i>Ribes.</i>
Fly honeysuckle, African	- <i>Halleria.</i>	Gooseberry, American	- <i>Melastoma.</i>
Fly trap, Venus'	- <i>Dionaea.</i>	Gooseberry of the Americans	- <i>Cactus.</i>
Fool's parsley	- <i>Aethusa.</i>	Gooseberry, Barbadoes	- <i>Cactus.</i>
Fool's stones	- <i>Orchis.</i>	Gorse	- <i>Ulex.</i>

Gourd

I N D E X.

English Names.	Botanic Names.	English Names.	Botanic Names.
Gourd	<i>Cucurbita.</i>	Herb two pence	<i>Lyfimachia.</i>
Gourd, Ethiopian four	<i>Adansonia.</i>	Herb, willow	<i>Epilobium.</i>
Gourd tree, Indian	<i>Crescentia.</i>	Herb, willow	<i>Lythrum.</i>
Grain, scarlet	<i>Quercus.</i>	Herb, willow	<i>Lyfimachia.</i>
Grains of Paradise	<i>Amomum.</i>	Hercules' club	<i>Zanthoxylum.</i>
Grape tree	<i>Vitis.</i>	Hermodactyle	<i>Iris.</i>
Grape, sea-side	<i>Coccoloba.</i>	Hicory nut tree	<i>Juglans.</i>
Grape, hyacinth	<i>Hyacinthus.</i>	Hind berry	<i>Rubus.</i>
Greek valerian	<i>Polemonium.</i>	Hollow root	<i>Adoxa.</i>
Grim the collier	<i>Hieracium.</i>	Holly tree	<i>Ilex.</i>
Groundfel	<i>Succio.</i>	Holly, knee	<i>Ruscus.</i>
Groundfel tree	<i>Baccharis.</i>	Holly, sea	<i>Eryngium.</i>
Guava	<i>Psidium.</i>	Hollyhock	<i>Alcea.</i>
Guava, French	<i>Cassa.</i>	Honesty	<i>Lunaria.</i>
Guelder Rose	<i>Viburnum.</i>	Honey flower	<i>Melanthus.</i>
Guelder Rose, currant-leaved	<i>Spiræa.</i>	Honey locust	<i>Gleditsia.</i>
Guelder Rose, Virginia	<i>Spiræa.</i>	Honeyfuckle	<i>Lonicera.</i>
Guernsey lily	<i>Amaryllis.</i>	Honeyfuckle, African fly	<i>Halleria.</i>
Gum anime	<i>Hymenæa.</i>	Honeyfuckle, American	} <i>Azalca.</i>
Gum elemi	<i>Amyris.</i>	upright	
Gum elemi tree	<i>Pistacia.</i>	Honeyfuckle, French	<i>Hedysarum.</i>
Gum, sweet	<i>Liquidambar.</i>	Honey wort	<i>Cerithe.</i>
Gum tragacanth	<i>Astragalus.</i>	Hop	<i>Humulus.</i>
Gum arabic	<i>Mimosa.</i>	Hornbeam tree	<i>Carpinus.</i>
Gum galbanum	<i>Bubon.</i>	Horned poppy	<i>Chelidonium.</i>
H.		Horns	<i>Medicago.</i>
Hare bells	<i>Hyacinthus.</i>	Horse-chestnut tree	<i>Æsculus.</i>
Hare's ear	<i>Bupleurum.</i>	Horse radish	<i>Cochlearia.</i>
Hare's ear, bastard	<i>Phyllis.</i>	Horse-tail, shrubby	<i>Ephedra.</i>
Hart wort, shrubby Æthi-	} <i>Bupleurum.</i>	Horse-tongue	<i>Ruscus.</i>
opian		Hottentot cherry	<i>Cassine.</i>
Hawk weed	<i>Hieracium.</i>	Hound's tongue	<i>Cynoglossum.</i>
Hawk weed, bastard	<i>Crepis.</i>	House-leek	<i>Sempervivum.</i>
Hawthorn	<i>Cratægus.</i>	House-leek, lesser	<i>Sedum.</i>
Hawthorn, black American	<i>Viburnum.</i>	Humble plant	<i>Mimosa.</i>
Hay, Burgundy	<i>Medicago.</i>	Humming bird tree	<i>Chelone.</i>
Hazel-nut tree	<i>Corylus.</i>	Hyacinth	<i>Hyacinthus.</i>
Hazel, witch	<i>Hamamelis.</i>	Hyacinth, African blue	<i>Crinum.</i>
Heart's ease	<i>Viola.</i>	Hyacinth, lily	<i>Scilla.</i>
Heath	<i>Erica.</i>	Hyacinth, peruvian	<i>Scilla.</i>
Heath, mountain	<i>Saxifraga.</i>	Hyacinth, starry	<i>Scilla.</i>
Heath, African	<i>Phyllis.</i>	Hypericum frutex	<i>Spiræa.</i>
Heath, berry-bearing	<i>Empetrum.</i>	Hyssop	<i>Hyssopus.</i>
Heath, black-berried	<i>Empetrum.</i>	Hyssop, mountain	<i>Thymbra.</i>
Heath pea	<i>Orobus.</i>	I.	
Hedgehog trefoil	<i>Medicago.</i>	Jacinth	<i>Hyacinthus.</i>
Hedgehog thistle	<i>Cactus.</i>	Jack in a box	<i>Hernandia.</i>
Hedgehog holly	<i>Ilex.</i>	Jacob's ladder	<i>Polemonium.</i>
Hedge nettle, shrubby	<i>Prasum.</i>	Jacobæa lily	<i>Amaryllis.</i>
Heliotrope	<i>Heliotropium.</i>	Jalap	<i>Mirabilis.</i>
Hellebore	<i>Helleborus.</i>	Jalap	<i>Convolvulus.</i>
Hellebore, black	<i>Helleborus.</i>	Jasmine	<i>Jasminum.</i>
Hellebore, white	<i>Veratrum.</i>	Jasmine, Arabian	<i>Jasminum.</i>
Helmet flower	<i>Aconitum.</i>	Jasmine, Arabian	<i>Nyctagthes.</i>
Hemp	<i>Cannabis.</i>	Jasmine, Cape	<i>Gardenia.</i>
Hemp agrimony	<i>Eupatorium.</i>	Jasmine, bastard	<i>Cestrum.</i>
Hen-weed, Guinea	<i>Petiveria.</i>	Jasmine, scarlet	<i>Bignonia.</i>
Hep tree	<i>Rosa.</i>	Jasmine, red	<i>Plumieria.</i>
Hepatica	<i>Anemone.</i>	Jasmine, Persian	<i>Syringa.</i>
Heron Bennet	<i>Geum.</i>	Jasmine, Indian wild	<i>Ixora.</i>
Herb Christopher	<i>Alcea.</i>	Jericho, rose of	<i>Anastatica.</i>
Herb of grace	<i>Ruta.</i>	Jersey tea, new	<i>Ceanothus.</i>
Herb of st. Ick	<i>Satureia.</i>	Jerusalem artichoke	<i>Helianthus.</i>
Herb Paris, of Canada	<i>Trillium.</i>	Jerusalem, oak of	<i>Chenopodium.</i>

Jerusalem

English Names.	Botanic Names.	English Names.	Botanic Names.
Jerusalem sage	- <i>Phlomis.</i>	Laurel, sea side	- <i>Phyllanthus.</i>
Jesuit's bark tree, true	- <i>Cinchona.</i>	Laurel, spurge	- <i>Daphne.</i>
Jesuit's bark tree, false	- <i>Iva.</i>	Laureola	- <i>Daphne.</i>
Jew's frankincense	- <i>Styrax.</i>	Laurel-leaved tulip tree	- <i>Magnolia.</i>
Johnsonia	- <i>Callicarpa.</i>	<i>Laurustinus</i>	- <i>Viburnum.</i>
Jonquil	- <i>Narcissus.</i>	Leadwort	- <i>Plumbago.</i>
Judas tree	- <i>Cercis.</i>	Leatherwood	- <i>Dirca.</i>
Jujube tree	- <i>Rhamnus.</i>	Leek	- <i>Allium.</i>
July flower, clove	- <i>Dianthus.</i>	Lemon tree	- <i>Citrus.</i>
July flower, queen's	- <i>Hesperis.</i>	Lentisc	- <i>Pistacia.</i>
July flower, stock	- <i>Cheiranthus.</i>	Leopard's bane	- <i>Doronicum.</i>
Juniper tree	- <i>Juniperus.</i>	Leopard's bane, mountain	- <i>Arnica.</i>
Jupiter's beard	- <i>Anthyllis.</i>	Lettuce	- <i>Lactuca.</i>
Jupiter's beard, American	- <i>Amorpha.</i>	Lettuce, lamb's	- <i>Veronica.</i>
Immortal flower	- <i>Gomphrena.</i>	Life, tree of	- <i>Thuja.</i>
Indian god tree	- <i>Ficus.</i>	Life, wood of	- <i>Guaiacum.</i>
Indian shot	- <i>Canna.</i>	Lignum vitæ	- <i>Guaiacum.</i>
Indian arrow root	- <i>Maranta.</i>	Lilac	- <i>Syringa.</i>
Indigo	- <i>Indigofera.</i>	Lily	- <i>Lilium.</i>
Indigo, bastard	- <i>Amorpha.</i>	Lily, African scarlet	- <i>Amaryllis.</i>
Iris	- <i>Iris.</i>	Lily, African blue	- <i>Agapanthus.</i>
Iris, bulbous	- <i>Iris.</i>	Lily, asphodel	- <i>Crinum.</i>
Iris, Persian bulbous	- <i>Iris.</i>	Lily, asphodel	- <i>Heimerocallis.</i>
Iris uvaria	- <i>Aletris.</i>	Lily, Atamafco	- <i>Amaryllis.</i>
Iron wood	- <i>Sideroxylum.</i>	Lily, belladonna	- <i>Amaryllis.</i>
Iron wort	- <i>Sideritis.</i>	Lily, day	- <i>Heimerocallis.</i>
Ivy tree	- <i>Hedera.</i>	Lily, Guernsey	- <i>Amaryllis.</i>
Ivy, American	- <i>Kalmia.</i>	Lily, Jacobæa	- <i>Amaryllis.</i>
K.		Lily, St. Bruno's	- <i>Heimerocallis.</i>
Kale	- <i>Brassica.</i>	Lily, Japan	- <i>Amaryllis.</i>
Kale, sea	- <i>Crambe.</i>	Lily, Martagon	- <i>Lilium.</i>
Kalmia	- <i>Kalmia.</i>	Lily, Mexican	- <i>Amaryllis.</i>
Kermes oak	- <i>Quercus.</i>	Lily, May	- <i>Convallaria.</i>
Ketmia, bladder	- <i>Hibiscus.</i>	Lily, Persian	- <i>Fritillaria.</i>
Kidney bean	- <i>Phaseolus.</i>	Lily, pyramidal	- <i>Lilium.</i>
Kidney bean tree	- <i>Glycine.</i>	Lily, superb	- <i>Gloriosa.</i>
Kidney vetch	- <i>Anthyllis.</i>	Lily, water	- <i>Nymphaea.</i>
King's spear	- <i>Asphodelus.</i>	Lily, Ceylon	- <i>Amaryllis.</i>
Knap weed	- <i>Centaurea.</i>	Lily-daffodil	- <i>Pancratium.</i>
Knee holly	- <i>Ruscus.</i>	Lily-daffodil	- <i>Amaryllis.</i>
Knee holm	- <i>Ruscus.</i>	Lily-hyacinth	- <i>Scilla.</i>
Knot-grass	- <i>Polygonum.</i>	Lily thorn	- <i>Catechua.</i>
L.		Lily of the valley	- <i>Convallaria.</i>
Laburnum	- <i>Cytisus.</i>	Lime	- <i>Citrus.</i>
Lac tree	- <i>Rhus.</i>	Lime tree	- <i>Tilia.</i>
Ladanum	- <i>Cistus.</i>	Lion's foot, Candy	- <i>Catananche.</i>
Ladder, Jacob's	- <i>Polemonium.</i>	Lion's tail	- <i>Leonurus.</i>
Lady's bower	- <i>Clematis.</i>	Liquorice	- <i>Glycyrrhiza.</i>
Lady's cushion	- <i>Saxifraga.</i>	Liquorice, wild	- <i>Astragalus.</i>
Lady's finger	- <i>Anthyllis.</i>	Liquorice vetch, knob- rooted	- <i>Glycine.</i>
Lady's mantle	- <i>Alchemilla.</i>	Live-ever	- <i>Sedum.</i>
Lady's smock	- <i>Cardamine.</i>	Liver wort, noble	- <i>Anemone.</i>
Lady's slipper	- <i>Cypripedium.</i>	Lobel's catchfly	- <i>Silene.</i>
Lady's traces	- <i>Ophrys.</i>	Loblolly bay	- <i>Gordonia.</i>
Lamb's lettuce	- <i>Valeriana.</i>	Locker gowlans	- <i>Trollius.</i>
Larch tree	- <i>Pinus.</i>	Locust tree	- <i>Hymenæa.</i>
Larkspur	- <i>Delphinium.</i>	Locust tree	- <i>Robinia.</i>
Lavender	- <i>Lavendula.</i>	Locust tree, honey	- <i>Gleditsia.</i>
Lavender, cotton	- <i>Santolina.</i>	Logwood	- <i>Hematoxylum.</i>
Lavender, sea	- <i>Statice.</i>	London pride	- <i>Saxifraga.</i>
Laurel tree	- <i>Prunus.</i>	Looking glass, Venus'	- <i>Campanula.</i>
Laurel, Alexandrian	- <i>Ruscus.</i>	Loose-strife	- <i>Lysimachia.</i>
Laurel, dwarf American	- <i>Kalmia.</i>		

I N D E X.

<i>English Names.</i>	<i>Botanic Names.</i>	<i>English Names.</i>	<i>Botanic Names.</i>
Loose-strife, purple	- <i>Lytbrum.</i>	Meadow rue	- <i>Thalictrum.</i>
Lote tree	- <i>Celtis.</i>	Meadow saffron	- <i>Colchicum.</i>
Lotus of Homer	- <i>Diospyros.</i>	Meadow sweet	- <i>Spiræa.</i>
Lovage	- <i>Ligusticum.</i>	Meadows, queen of the	- <i>Spiræa.</i>
Love apple	- <i>Solanum.</i>	Meally tree	- <i>Viburnum.</i>
Love flower	- <i>Xylophylla.</i>	Meadia	- <i>Dodecatheon.</i>
Love lies a-bleeding	- <i>Amaranthus.</i>	Medic	- <i>Medicago.</i>
Lucern grafs	- <i>Medicago.</i>	Medlar tree	- <i>Mespilus.</i>
Lung wort	- <i>Pulmonaria.</i>	Medusa's-head	- <i>Euphorbia.</i>
Lupine	- <i>Lupinus.</i>	Melancholy tree	- <i>Nyctanthes.</i>
Lychnidea	- <i>Phlox.</i>	Melon	- <i>Cucumis.</i>
Lychnis, scarlet	- <i>Lychnis.</i>	Melon, water	- <i>Cucurbita.</i>
Lychnis, dwarf	- <i>Silene.</i>	Melon thistle	- <i>Cactus.</i>
M.		Mezereon	- <i>Daphne.</i>
Macaw tree	- <i>Coccos.</i>	Mignonette	- <i>Reseda.</i>
Mad apple	- <i>Solanum.</i>	Milfoil	- <i>Achillea.</i>
Madder	- <i>Rubia.</i>	Milk vetch	- <i>Astragalus.</i>
Madwort	- <i>Alyssum.</i>	Milk-wort	- <i>Polygala.</i>
Mahaleb	- <i>Prunus.</i>	Mint	- <i>Mentha.</i>
Mahogany tree	- <i>Sweetenia.</i>	Mint, cat	- <i>Nepeta.</i>
Maiden hair	- <i>Adiantum.</i>	Mint, pepper	- <i>Mentha.</i>
Maidea hair tree	- <i>Mauritia.</i>	Mistletoe	- <i>Viscum.</i>
Maiz, or Mays	- <i>Zea.</i>	Mock orange	- <i>Philadelphus.</i>
Malabar nut tree	- <i>Justicia.</i>	Mock privet	- <i>Phillyrea.</i>
Male-balsam apple	- <i>Momordica.</i>	Moldavian balm	- <i>Dracocephalum.</i>
Mallow	- <i>Malva.</i>	Moly	- <i>Allium.</i>
Mallow, rose	- <i>Alcea.</i>	Monkey flower	- <i>Mimulus.</i>
Mallow, Indian	- <i>Sida.</i>	Monk's hood	- <i>Aconitum.</i>
Mallow, tree	- <i>Lavatera.</i>	Moon-seed	- <i>Menispermum.</i>
Mallow, Syrian	- <i>Hibiscus.</i>	Moon trefoil	- <i>Medicago.</i>
Mammee-sapota	- <i>Achras.</i>	Moor-berries	- <i>Vaccinium.</i>
Mammee-tree	- <i>Mammea.</i>	Moon wort	- <i>Lunaria.</i>
Mandrake	- <i>Atropa.</i>	Moss-berries	- <i>Vaccinium.</i>
Mangostan	- <i>Garcinia.</i>	Moschatel, tuberous.	- <i>Adoxa.</i>
Mango tree	- <i>Mangifera.</i>	Moth-mullein	- <i>Verbascum.</i>
Manihot	- <i>Jatropha.</i>	Mother of thyme	- <i>Thymus.</i>
Manna ash	- <i>Fraxinus.</i>	Mountain ash	- <i>Sorbus.</i>
Maple-tree	- <i>Acer.</i>	Mugwort	- <i>Artemisia.</i>
Marigold	- <i>Calendula.</i>	Mule pink	- <i>Dianthus.</i>
Marigold, African	- <i>Tagetes.</i>	Mulberry-tree	- <i>Morus.</i>
Marigold, French	- <i>Tagetes.</i>	Mulberry blite	- <i>Blitum.</i>
Marigold, marsh	- <i>Caltha.</i>	Mullein	- <i>Verbascum.</i>
Marigold, corn	- <i>Chrysanthemum.</i>	Mushroom	- <i>Agaricus.</i>
Marigold, fig	- <i>Mesembryanthemum.</i>	Mustard	- <i>Sinapis.</i>
Marjoram, common sweet	- <i>Origanum.</i>	Myrrh, or sweet fern	- <i>Scandix.</i>
Marjoram, pot	- <i>Origanum.</i>	Myrtle	- <i>Myrtus.</i>
Marjoram, wild	- <i>Origanum.</i>	Myrtle, all-spice	- <i>Myrtus.</i>
Marjoram, winter	- <i>Origanum.</i>	Myrtle, candle-berry	- <i>Myrica.</i>
Marsh-mallow	- <i>Althæa.</i>	Myrtle, Dutch	- <i>Myrica.</i>
Martagon lily	- <i>Lilium.</i>	N.	
Marum	- <i>Satureia.</i>	Naples, star of	- <i>Ornithogalum.</i>
Marum, Syrian or Cretan	- <i>Origanum.</i>	Narcissus, common	- <i>Narcissus.</i>
Marvel of Peru	- <i>Mirabilis.</i>	Narcissus, autumnal	- <i>Amaryllis.</i>
Masterwort, black	- <i>Astrantia.</i>	Nasturtium	- <i>Tropæolum.</i>
Mastic tree	- <i>Pistacia.</i>	Navel-wort	- <i>Cotyledon.</i>
Mastic tree, Indian	- <i>Schinus.</i>	Navel-wort, bastard	- <i>Crassula.</i>
Mastic, herb	- <i>Satureia.</i>	Navel-wort, Venus'	- <i>Cynoglossum.</i>
Mastic thyme	- <i>Thymus.</i>	Navew	- <i>Brassica.</i>
Maudlin	- <i>Achillea.</i>	Nectarine tree	- <i>Amygdalus.</i>
Maw seed	- <i>Papaver.</i>	Needle, Adam's	- <i>Yucca.</i>
May bush	- <i>Crataegus.</i>	Nep	- <i>Nepeta.</i>
May lily	- <i>Convallaria.</i>	Nettle, snowy	- <i>Urtica.</i>

Nettle,

I N D E X.

<i>English Names.</i>	<i>Botanic Names.</i>	<i>English Names.</i>	<i>Botanic Names.</i>
Nettle, hemp Tartarian	<i>Urtica.</i>	Palm, mountain fan	<i>Corypha.</i>
Nettle, Canada	<i>Urtica.</i>	Palm, ringed	<i>Cycas.</i>
Nettle-tree	<i>Celtis.</i>	Palma-Christi	<i>Ricinus.</i>
Nickar tree	<i>Guilandina.</i>	Palmetto	<i>Chamærops.</i>
Nightshade	<i>Solanum.</i>	Pansies or Pansey	<i>Viola.</i>
Nightshade, American	<i>Phytolacca.</i>	Papaw tree	<i>Carica.</i>
Nightshade, deadly	<i>Atropa.</i>	Papaw tree, North American	<i>Annona.</i>
Nightshade, Malabar	<i>Basella.</i>	Paradise, tree of	<i>Musa.</i>
Nolana	<i>Nolana.</i>	Park leaves	<i>Hypericum.</i>
Noli me tangere	<i>Impatiens.</i>	Parsley	<i>Apium.</i>
Noli me tangere	<i>Momordica.</i>	Parsley, fool's	<i>Ethusa.</i>
None-so-pretty	<i>Saxifraga.</i>	Parsley, Macedonian	<i>Bubon.</i>
Nut-tree	<i>Corylus.</i>	Parsley, stone	<i>Bubon.</i>
Nut, bladder	<i>Staphylæa.</i>	Parsnep	<i>Pastinaca.</i>
Nut, cashew	<i>Anacardium.</i>	Parsnep, water	<i>Sium.</i>
Nut, chocolate	<i>Theobroma.</i>	Pasque Flower	<i>Anemone.</i>
Nut, cob	<i>Corylus.</i>	Passion-flower	<i>Passiflora.</i>
Nut, cocoa	<i>Cocos.</i>	Patience	<i>Rumex.</i>
Nut, faufel	<i>Areca.</i>	Paul's betony	<i>Veronica.</i>
Nut, hazel	<i>Corylus.</i>	Pea, common	<i>Pisum.</i>
Nut, Malabar,	<i>Justicia.</i>	Pea, crown	<i>Pisum.</i>
Nut, oil	<i>Ricinus.</i>	Pea, everlasting	<i>Lathyrus.</i>
Nut, physic	<i>Jatropha.</i>	Pea, heath	<i>Orobus.</i>
Nut, pistachia	<i>Pistacia.</i>	Pea, painted lady	<i>Lathyrus.</i>
Nut, wall	<i>Juglans.</i>	Pea, pigeon	<i>Cytisus.</i>
O.		Pea, scarlet	<i>Lathyrus.</i>
Oak-tree	<i>Quercus.</i>	Pea, sweet	<i>Lathyrus.</i>
Oak-tree, evergreen	<i>Quercus.</i>	Pea, Tangier	<i>Lathyrus.</i>
Oak of Jerusalem	<i>Chenopodium.</i>	Pea, winged	<i>Lotus.</i>
Oak, poison	<i>Rhus.</i>	Pea, wood	<i>Orobus.</i>
Oil-nut	<i>Ricinus.</i>	Peach tree	<i>Amygdalus.</i>
Old man's beard	<i>Clematis.</i>	Peach, wolf's	<i>Solanum.</i>
Oleander	<i>Nerium.</i>	Pear tree	<i>Pyrus.</i>
Oleaster	<i>Elæagnus.</i>	Pear, avocado	<i>Laurus.</i>
Olive	<i>Olea.</i>	Pear, prickly	<i>Cactus.</i>
Olive, spurge	<i>Daphne.</i>	Pear, garlick	<i>Cratæva.</i>
Olive, wild	<i>Elæagnus.</i>	Peerless primrose	<i>Narcissus.</i>
Olive, wild, of Barbadoes	<i>Bourea.</i>	Pellitory of Spain	<i>Anthemis.</i>
Onion	<i>Allium.</i>	Pellitory tree	<i>Zanthoxylum.</i>
Onion, sea	<i>Scilla.</i>	Penguin	<i>Bromelia.</i>
Onion-tree	<i>Allium.</i>	Penstemon	<i>Chelone.</i>
Orange tree	<i>Citrus.</i>	Pennyroyal	<i>Mentha.</i>
Orange, mock	<i>Philadelphus.</i>	Peony	<i>Pæonia.</i>
Origany	<i>Origanum.</i>	Pepper tree	<i>Piper.</i>
Orpine	<i>Sedum.</i>	Pepper, bell	<i>Capsicum.</i>
Orpine, lesser	<i>Crassula.</i>	Pepper, bird	<i>Capsicum.</i>
Orpine, tree	<i>Telephium.</i>	Pepper, bonnet	<i>Capsicum.</i>
Orach	<i>Atriplex.</i>	Pepper, Guinea	<i>Capsicum.</i>
Orach, berry-bearing	<i>Blitum.</i>	Pepper grape	<i>Vitis.</i>
Orach, wild	<i>Chenopodium.</i>	Pepper, Indian	<i>Capsicum.</i>
Oser	<i>Salix.</i>	Pepper, Jamaica	<i>Myrtus.</i>
Oswego tea	<i>Monarda.</i>	Pepper mint	<i>Mentha.</i>
Ox-eye	<i>Bupthalmum.</i>	Pepper, wall	<i>Sedum.</i>
Ox-eye daisy	<i>Chrysanthemum.</i>	Pepper-wort	<i>Lepidium.</i>
Ox-lips	<i>Primula.</i>	Periwinkle	<i>Vinca.</i>
P.		Persicaria	<i>Polygonum.</i>
Pæony	<i>Pæonia.</i>	Persimon plum	<i>Diospyros.</i>
Painted-lady	<i>Dianthus.</i>	Petty whin	<i>Ononis.</i>
Painted-lady peas	<i>Lathyrus.</i>	Pheasant's eye	<i>Adonis.</i>
Palm tree	<i>Phoenix.</i>	Pheasant's eye	<i>Dianthus.</i>
Palm tree, dwarf	<i>Chamærops.</i>	Phillyrea, Cape	<i>Cassine.</i>
Palm, cocoa nut	<i>Cocos.</i>	Phillyrea, common	<i>Phillyrea.</i>
Palm, faufel nut	<i>Areca.</i>	Phillyrea, false	<i>Rhamnus.</i>

I N D E X

English Names.	Botanic Names.	English Names.	Botanic Names.
Phu	<i>Valeriana.</i>	Privet	<i>Ligustrum.</i>
Privet, evergreen	<i>Rhamnus.</i>	Privet, evergreen	<i>Ligustrum.</i>
Physic nut	<i>Jatropha.</i>	Privet, mock	<i>Phillyrea.</i>
Pigeon pea	<i>Cytisus.</i>	Puccoon	<i>Sanguinaria.</i>
Pile-wort	<i>Ranunculus.</i>	Pudding-pipe tree	<i>Cassia.</i>
Pimento (all-spice)	<i>Myrtus.</i>	Pulsatilla, or pasque flower	<i>Anemone.</i>
Pimpernel	<i>Anagallis.</i>	Pumpion. See Pompion	<i>Cucurbita.</i>
Pinafter	<i>Pinus.</i>	Pumpkin	<i>Ammona.</i>
Pine apple	<i>Bromelia.</i>	Purple-apple	<i>Portulaca.</i>
Pine apple, wild	<i>Bromelia.</i>	Purslane	<i>Atriplex.</i>
Pine tree	<i>Pinus.</i>	Purslane, sea	<i>Portulacaria.</i>
Pink	<i>Dianthus.</i>	Purslane tree	<i>Mespilus.</i>
Pink, Indian	<i>Dianthus.</i>		
Pink, mule	<i>Dianthus.</i>	Q.	
Pink, sea	<i>Statice.</i>	Quamoclit	<i>Ipomaea.</i>
Pin pillow	<i>Cactus.</i>	Queen of the meadows	<i>Spiraea.</i>
Pipe tree	<i>Syringa.</i>	Queen's balm	<i>Dracocephalum.</i>
Pipe tree, pudding	<i>Cassia.</i>	Queen's gilliflower	<i>Hesperis.</i>
Riperidge bush	<i>Berberis.</i>	Queen Marguerette	<i>Asper.</i>
Pippin	<i>Pyrus.</i>	Queen's violet	<i>Hesperis.</i>
Piquettes	<i>Dianthus.</i>	Queen stock, gilliflower	<i>Cheiranthus.</i>
Pishamin plum	<i>Diospyros.</i>	Quick, or quick-set	<i>Crataegus.</i>
Pistachia nut	<i>Pistacia.</i>	Quickbeam tree	<i>Sorbus.</i>
Pitch tree	<i>Pinus.</i>	Quicken tree	<i>Sorbus.</i>
Plane tree	<i>Platanus.</i>	Quince tree	<i>Pyrus.</i>
Plane tree, false	<i>Acer.</i>	Quince, bastard	<i>Mespilus.</i>
Plant, burning thorny	<i>Euphorbia.</i>	R.	
Plant, egg	<i>Solanum.</i>	Radish	<i>Raphanus.</i>
Plant, humble	<i>Mimosa.</i>	Radish, horse	<i>Cochlearia.</i>
Plant, ice	<i>Mesembryanthemum.</i>	Radish, turnep	<i>Raphanus.</i>
Plant, sensitive	<i>Mimosa.</i>	Radish, black Spanish	<i>Raphanus.</i>
Plant, bastard sensitive	<i>Æschynomene.</i>	Ragged Robin	<i>Lychnis.</i>
Plantain tree	<i>Musa.</i>	Ragwort	<i>Senecio.</i>
Plantain, bastard	<i>Heliconia.</i>	Ragwort, sea	<i>Cineraria.</i>
Plant mealy tree	<i>Kiburnum.</i>	Ragwort, African	<i>Othonna.</i>
Plowman's spikenard	<i>Baccharis.</i>	Rampion, esculent	<i>Campanula.</i>
Plowman's spikenard	<i>Conyza.</i>	Ramsons	<i>Allium.</i>
Plum tree	<i>Prunus.</i>	Ranunculus, common	<i>Ranunculus.</i>
Plum, American black	<i>Chrysobalanus.</i>	Ranunculus, globe	<i>Trollius.</i>
Plum, bay	<i>Psidium.</i>	Rape	<i>Brassica.</i>
Plum, Brazilian	<i>Spondias.</i>	Raspberry	<i>Rubus.</i>
Plum, Indian date	<i>Diospyros.</i>	Rattlesnake root	<i>Polygala.</i>
Plum, pishamin or persimon	<i>Diospyros.</i>	Red cedar	<i>Juniperus.</i>
Poet's cassia	<i>Asyris.</i>	Reed, common	<i>Arundo.</i>
Poison tree	<i>Rhus.</i>	Reed, Spanish or Portugal	<i>Arundo.</i>
Poison ash	<i>Rhus.</i>	Reed, bamboo	<i>Arundo.</i>
Poison oak	<i>Rhus.</i>	Reed, Indian flowering	<i>Canna.</i>
Poley, mountain	<i>Teucrium.</i>	Rest-harrow	<i>Ononis.</i>
Polyanthos narcissus	<i>Narcissus.</i>	Rhubarb	<i>Rheum.</i>
Polyanthus	<i>Primula.</i>	Rhubarb, monk's	<i>Rumex.</i>
Pomegranate	<i>Punica.</i>	Roan tree	<i>Sorbus.</i>
Pompion	<i>Cucurbita.</i>	Robert, herb	<i>Geranium.</i>
Poplar tree	<i>Populus.</i>	Rocamboe	<i>Allium.</i>
Poppy	<i>Papaver.</i>	Rock-rose	<i>Cistus.</i>
Poppy, horned	<i>Chelidonium.</i>	Rocket, dame's violet, or	<i>Hesperis.</i>
Poppy, prickly	<i>Argemone.</i>	gilliflower.	
Potatoe	<i>Solanum.</i>	Rocket, bastard	<i>Reseda.</i>
Potatoe, Spanish	<i>Convolvulus.</i>	Rocket, night-smelling	<i>Hesperis.</i>
Prick-wood	<i>Eunonymus.</i>	Rocket	<i>Brassica.</i>
Primrose	<i>Primula.</i>	Rod, golden	<i>Solidago.</i>
Primrose, night	<i>Oenothera.</i>	Rod, Aaron's	<i>Solidago.</i>
Primrose, tree	<i>Oenothera.</i>	Rod-tree, golden	<i>Bosca.</i>
Prince's-feather	<i>Amaranthus.</i>	Root, China	<i>Smilax.</i>

Root,

<i>English Names.</i>	<i>Botanic Names.</i>	<i>English Names.</i>	<i>Botanic Names.</i>
Root, false China	<i>Senecio.</i>	Savory	<i>Satureja.</i>
Root, hollow	<i>Adoxa.</i>	Savoy cabbage, or Savoy	<i>Brassica.</i>
Root, rose	<i>Rhodiola.</i>	Savoy spiderwort	<i>Anthericum.</i>
Root, snake	<i>Aristolochia.</i>	Saw-wort	<i>Serratula.</i>
Root, rattle-snake	<i>Polygala.</i>	Saxifrage	<i>Saxifraga.</i>
Root, sweet	<i>Glycyrrhiza.</i>	Saxifrage, golden	<i>Chrysosplenium.</i>
Rose tree	<i>Rosa.</i>	Scabious	<i>Scabiosa.</i>
Rose, China	<i>Hibiscus.</i>	Scallion	<i>Allium.</i>
Rose, Christmas	<i>Helleborus.</i>	Scorpion fena	<i>Coronilla.</i>
Rose, corn	<i>Pajaver.</i>	Scorzonera	<i>Scorzonera.</i>
Rose, Guelder	<i>Viburnum.</i>	Scotch fir	<i>Pinus.</i>
Rose, Virginia Guelder	<i>Spiræa.</i>	Scotch kale	<i>Brassica.</i>
Rose, Japan	<i>Camellia.</i>	Scurvy grafs	<i>Cochlearia.</i>
Rose, rock	<i>Cistus.</i>	Sea buckthorn	<i>Hippophæ.</i>
Rose of Jericho	<i>Anastatica.</i>	Sea cabbage	<i>Crambe.</i>
Rose bay	<i>Nerium.</i>	Sea daffodil	<i>Pancratium.</i>
Rose bay, mountain	<i>Rhododendron.</i>	Sea holly	<i>Eryngium.</i>
Rose bay, dwarf	<i>Rhododendron.</i>	Sea lavender	<i>Statice.</i>
Rose bay, willow herb	<i>Epilobium.</i>	Sea purslane	<i>Atriplex.</i>
Rose mallow	<i>Alcea.</i>	Sea-side grape	<i>Coccoloba.</i>
Rose root	<i>Rhodiola.</i>	Sea-side laurel	<i>Phyllanthus.</i>
Rose periwinkle of Madagascar	<i>Vinca.</i>	Sebesten	<i>Cordia.</i>
Rosemary	<i>Rosmarinus.</i>	Sedum tree	<i>Sempervivum.</i>
Rosemary, wild	<i>Ledum.</i>	Sedum, lesser house-leek	<i>Sedum.</i>
Rough bindweed	<i>Smilax.</i>	Sena of the shops	<i>Cassia.</i>
Rue	<i>Ruta.</i>	Sena, bladder	<i>Colutea.</i>
Rue, meadow	<i>Thalictrum.</i>	Sena, scorpion	<i>Coronilla.</i>
Rush, flowering	<i>Butomus.</i>	Sena, wild	<i>Cassia.</i>
Rush, sweet	<i>Acorus.</i>	Senega rattlesnake root	<i>Polygala.</i>
Ruyfchiana	<i>Draccephalum.</i>	Sengreen (house-leek)	<i>Sempervivum.</i>
S.		Sensitive plant	<i>Mimosa.</i>
Saffron	<i>Crocus.</i>	Sensitive plant, bastard	<i>Æschynomene.</i>
Saffron, bastard, or false flower.	<i>Carthamus.</i>	Service tree, sweet	<i>Sorbus.</i>
Saffron, meadow	<i>Colchicum.</i>	Service tree, bird's	<i>Sorbus.</i>
Sage	<i>Salvia.</i>	Service tree, maple-leaved	<i>Cratægus.</i>
Sage, Jerusalem	<i>Phlomis.</i>	Service tree, wild	<i>Cratægus.</i>
Sage, Indian wild	<i>Lantana.</i>	Shaddock	<i>Citrus.</i>
Sage tree	<i>Phlomis.</i>	Shallot	<i>Allium.</i>
Sage, wood	<i>Teucrium.</i>	Shot, Indian	<i>Canna.</i>
St. Andrew's cross	<i>Ascyrum.</i>	Siberian crab	<i>Pyrus.</i>
St. Bruno's lily	<i>Anthericum.</i>	Side-saddle flower	<i>Sarracena.</i>
Saint-foin	<i>Hedysarum.</i>	Silk cotton tree	<i>Bombax.</i>
St. John's bread	<i>Ceratonia.</i>	Silk, virgin	<i>Periploca.</i>
St. John's-wort	<i>Hypericum.</i>	Silver bush	<i>Anthyllis.</i>
St. Peter's-wort	<i>Ascyrum.</i>	Silver fir	<i>Pinus.</i>
St. Peter's-wort	<i>Hypericum.</i>	Silver tree	<i>Protea.</i>
St. Peter's-wort, shrubby	<i>Lonicera.</i>	Skirret	<i>Sium.</i>
Sallad, corn	<i>Kaleriana.</i>	Skull-cap	<i>Scutellaria.</i>
Sallow tree	<i>Salix.</i>	Skrew tree	<i>Helicteres.</i>
Salsafy	<i>Tragopogon.</i>	Sky flower	<i>Cineraria.</i>
Samphire	<i>Crithmum.</i>	Slipper, lady's	<i>Cypripedium.</i>
Sand-box tree	<i>Hura.</i>	Slipper-wort	<i>Calceolaria.</i>
Sanicle, bear's ear	<i>Cortufa.</i>	Sloe tree	<i>Prunus.</i>
Sapota tree	<i>Achras.</i>	Smallage	<i>Apium.</i>
Sapota, mammee	<i>Achras.</i>	Snail plant	<i>Medicago.</i>
Sarsaparilla	<i>Smilax.</i>	Snail trefoil	<i>Medicago.</i>
Sassafras tree	<i>Laurus.</i>	Snake cucumber	<i>Cucumis.</i>
Satin flower	<i>Lunaria.</i>	Snake root	<i>Aristolochia.</i>
Savin	<i>Juniperus.</i>	Snake root, rattle-	<i>Polygala.</i>
Savin, Indian	<i>Bauhinia.</i>	Snap-dragon	<i>Antirrhinum.</i>
		Sneeze-wort	<i>Achillea.</i>
		Snow-ball tree	<i>Viburnum.</i>

I N D E X.

<i>English Names.</i>	<i>Botanic Names.</i>	<i>English Names.</i>	<i>Botanic Names.</i>
Snowberry tree	<i>Chiococco.</i>	Storax, liquid	<i>Liquidambar.</i>
Snow-drop	<i>Galanthus.</i>	Storax tree	<i>Styrax.</i>
Snow-drop, greater	<i>Leucoium.</i>	Stramonium	<i>Datura.</i>
Snow-drop tree	<i>Chicnanthus.</i>	Strawberry	<i>Fragaria.</i>
Soap-berry tree	<i>Sapindus.</i>	Strawberry blite	<i>Blitum.</i>
Soap-wort	<i>Sapindus.</i>	Strawberry spinach	<i>Blitum.</i>
Soap-wort, American	<i>Rhexia.</i>	Strawberry tree	<i>Arbutus.</i>
Solomon's seal	<i>Caroallaria.</i>	Succory	<i>Cichorium.</i>
Sorb tree	<i>Sorbus.</i>	Sugar cane	<i>Saccharum.</i>
Sorb tree, wild	<i>Sorbus.</i>	Sultan flower	<i>Centaurea.</i>
Sorrel	<i>Rumex.</i>	Sultan, sweet	<i>Centaurea.</i>
Sorrel tree, Carolina	<i>Andromeda.</i>	Sumach	<i>Rhus.</i>
Sorrel, wood	<i>Oxalis.</i>	Sumach, myrtle-leaved	<i>Coriaria.</i>
Sorrowful tree	<i>Nyctanthes.</i>	Sumach, currier's ortanner's	<i>Coriaria.</i>
Sour-gourd, Æthiopian	<i>Adansonia.</i>	Sunflower	<i>Helianthus.</i>
Sour sop	<i>Annona.</i>	Sunflower, dwarf Ameri- can	<i>Rudbeckia.</i>
Southernwood	<i>Artemisia.</i>	Sunflower, little	<i>Cistus.</i>
South-sea bread-fruit tree	<i>Artocarpus.</i>	Sunflower, tick-seeded	<i>Coreopsis.</i>
South-sea tea	<i>Ilex.</i>	Superb lily	<i>Gloriosa.</i>
Sow-bread	<i>Cyclamen.</i>	Supple jack	<i>Rhamnus.</i>
'Sparagus, erroneously call- ed Sparrow-grafs	<i>Asparagus.</i>	Swallow-wort	<i>Asclepias.</i>
Sparrow-wort	<i>Passerina.</i>	Swallow-wort, African	<i>Stapelia.</i>
Speed-well	<i>Veronica.</i>	Sweet briar	<i>Rosa.</i>
Spice, all-	<i>Myrtus.</i>	Sweet flag	<i>Acorus.</i>
Spice, Carolina all-	<i>Calycanthus.</i>	Sweet gum	<i>Liquidambar.</i>
Spider-wort	<i>Anthericum.</i>	Sweet pea	<i>Lathyrus.</i>
Spider-wort, Virginia	<i>Tradescantia.</i>	Sweet root	<i>Glycyrrhiza.</i>
Spikenard	<i>Baccharis.</i>	Sweet sop	<i>Annona.</i>
Spinach	<i>Spinacia.</i>	Sweet sultan	<i>Centaurea.</i>
Spinach, strawberry	<i>Blitum.</i>	Sweet William	<i>Dianthus.</i>
Spindle tree,	<i>Eunonymus.</i>	Sweet willow,	<i>Myrica.</i>
Spindle tree, bastard	<i>Celastrus.</i>	Sycamore tree	<i>Acer.</i>
Spirting cucumber	<i>Momordica.</i>	Sycamorus fig	<i>Ficus.</i>
Spiræa-frutex	<i>Spiræa.</i>	Syringa	<i>Philadelphus.</i>
Spiræa, African	<i>Diosma.</i>	T.	
Spoon-wort	<i>Cochlearia.</i>	Tacamahaca	<i>Populus.</i>
Spruce fir	<i>Pinus.</i>	Tallow tree	<i>Croton.</i>
Spunge tree	<i>Mimosa.</i>	Tamarind tree	<i>Tamarindus.</i>
Spurge	<i>Euphorbia.</i>	Tamarisk	<i>Tamarix.</i>
Spurge laurel	<i>Daphne.</i>	Tansey	<i>Tanacetum.</i>
Squash	<i>Cucurbita.</i>	Tare	<i>Vicia.</i>
Squill	<i>Scilla.</i>	Tar tree	<i>Pinus.</i>
Squill, lesser white	<i>Pancratium.</i>	Tarragon	<i>Artemisia.</i>
Staff tree	<i>Celastrus.</i>	Tarton-raire	<i>Daphne.</i>
Stag's horn tree	<i>Rhus.</i>	Tea tree	<i>Thea.</i>
Star apple	<i>Chrysophyllum.</i>	Tea, New Jersey	<i>Ceanothus.</i>
Star of Alexandria	<i>Ornithogalum.</i>	Tea, Oswego	<i>Monarda.</i>
Star of Bethlehem	<i>Ornithogalum.</i>	Tea, South Sea	<i>Ilex.</i>
Star hyacinth	<i>Scilla.</i>	Tea, New Zealand	<i>Philadelphus.</i>
Star-flower	<i>Amellus.</i>	Thistle	<i>Carduus.</i>
Star of Naples	<i>Ornithogalum.</i>	Thistle, blessed	<i>Centaurea.</i>
Star thistle	<i>Centaurea.</i>	Thistle, distaff,	<i>Carthamus.</i>
Star-wort	<i>Aster.</i>	Thistle, hedgehog	<i>Caclus.</i>
Star-wort, bastard	<i>Ruphthalmum.</i>	Thistle, globe	<i>Echinops.</i>
Stock gilliflower	<i>Cheiranthus.</i>	Thistle, melon	<i>Caclus.</i>
Stock, dwarf, annual	<i>Cheiranthus.</i>	Thistle, torch	<i>Caclus.</i>
Stock, ten. weeks	<i>Cheiranthus.</i>	Thorn, black	<i>Prunus.</i>
Stock, virgin	<i>Cheiranthus.</i>	Thorn, box	<i>Lycium.</i>
Stone-crop	<i>Sedum.</i>	Thorn, Christ's	<i>Rhamnus.</i>
Stone-crop-tree	<i>Chenopodium.</i>	Thorn, Egyptian	<i>Mimosa.</i>

Thorn,

I N D E X.

<i>English Names.</i>	<i>Botanic Names.</i>	<i>English Names.</i>	<i>Botanic Names.</i>
Thorn, evergreen	- <i>Mespilus.</i>	Tutsan	- <i>Hypericum.</i>
Thorn, goat's	- <i>Astragalus.</i>	Two-pence, herb	- <i>Lyfimachia.</i>
Thorn, lily	- <i>Catesbæa.</i>	Twy-blade	- <i>Ophrys.</i>
Thorn, purging	- <i>Rhamnus.</i>	U.	
Thorn, white	- <i>Cratægus.</i>	Umbrella tree	- <i>Magnolia.</i>
Thorn-apple	- <i>Datura.</i>	V.	
Thorny plant, burning	- <i>Euphorbia.</i>	Valerian	- <i>Valeriana.</i>
Three-leaved grafs	- <i>Trifolium.</i>	Valerian, Greek	- <i>Polemonium.</i>
Thrift	- <i>Statice.</i>	Varnilh tree	- <i>Rhus.</i>
Throat wort	- <i>Campanula.</i>	Venus' fly-trap	- <i>Dionæa.</i>
Throat-wort, blue, umbel- liferous	- <i>Trachelium.</i>	Venus' looking-glass	- <i>Campanula.</i>
Thyme	- <i>Thymus.</i>	Venus' navel-wort	- <i>Cynoglossum.</i>
Thyme, mastic	- <i>Satureia.</i>	Vervain	- <i>Verbena.</i>
Thyme, mother of	- <i>Thymus.</i>	Vervain mallow	- <i>Malva.</i>
Tinus	- <i>Viburnum.</i>	Vetch	- <i>Vicia.</i>
Toad-flax	- <i>Antirrhinum.</i>	Vetch, bitter	- <i>Orobus.</i>
Tobacco	- <i>Nicotiana.</i>	Vetch, liquorice	- <i>Astragalus.</i>
Tolu tree, balsam of	- <i>Toluifera.</i>	Vetch, kidney	- <i>Anthyllis.</i>
Tomatoes	- <i>Solanum.</i>	Vetch, knob-rooted liquo- rice	- <i>Glycine.</i>
Tooth-ach tree	- <i>Zanthoxylum.</i>	Vetch, milk	- <i>Astragalus.</i>
Torch thistle	- <i>Cactus.</i>	Viburnum, American	- <i>Lantana.</i>
Touch me not	- <i>Impatiens.</i>	Vine tree	- <i>Vitis.</i>
Touch me not	- <i>Momordica.</i>	Vine, black	- <i>Tamus.</i>
Toxicodendron	- <i>Rhus.</i>	Vine, white	- <i>Bryonia.</i>
Tragacanth, gum	- <i>Astragalus.</i>	Violet	- <i>Viola.</i>
Traveller's joy	- <i>Clematis.</i>	Violet, dame's	- <i>Hesperis.</i>
Tree, celandine	- <i>Bocconia.</i>	Violet, dog's-tooth	- <i>Erythronium.</i>
Tree germander	- <i>Teucrium.</i>	Viper's grafs	- <i>Scorzonera.</i>
Tree mallow	- <i>Lavatera.</i>	Virgin bower	- <i>Clematis.</i>
Tree priunrose	- <i>Oenothera.</i>	Virgin silk	- <i>Periploca.</i>
Tree of life	- <i>Thuya.</i>	Virgin stock	- <i>Cheiranthus.</i>
Trefoil	- <i>Trifolium.</i>	Vitæ, arbor	- <i>Thuya.</i>
Trefoil, bean	- <i>Cytisus.</i>	Vitæ, lignum	- <i>Guaiacum.</i>
Trefoil, stinking bean	- <i>Anagyris.</i>	W.	
Trefoil, bird's-foot	- <i>Lotus.</i>	Wake Robin	- <i>Arum.</i>
Trefoil, moon	- <i>Medicago.</i>	Wall-flower	- <i>Cheiranthus.</i>
Trefoil, shrub	- <i>Ptelea.</i>	Walnut-tree	- <i>Juglans.</i>
Trefoil, snail	- <i>Medicago.</i>	Walnut tree, Jamaica	- <i>Hura.</i>
Trefoil, tree	- <i>Cytisus.</i>	Wart-wort	- <i>Euphorbia.</i>
Tricolor	- <i>Amaranthus.</i>	Water cress	- <i>Sisymbrium.</i>
Tricolor, violet	- <i>Viola.</i>	Water lily	- <i>Nymphaea.</i>
True-love of Canada	- <i>Trillium.</i>	Water melon	- <i>Cucurbita.</i>
Trumpet flower	- <i>Bignonia.</i>	Wayfaring tree	- <i>Viburnum.</i>
Trumpet honeysuckle	- <i>Lonicera.</i>	Weld, dyer's	- <i>Reseda.</i>
Tuberose	- <i>Polyanthes.</i>	Wheat	- <i>Triticum.</i>
Tulip	- <i>Tulipa.</i>	Wheat, buck	- <i>Polygonum.</i>
Tulip, African	- <i>Hæmanthus.</i>	Wheat, Indian	- <i>Zea.</i>
Tulip, chequered	- <i>Fritillaria.</i>	Wheat, Turkey	- <i>Zea.</i>
Tulip flower	- <i>Bignonia.</i>	Whin	- <i>Ulex.</i>
Tulip tree	- <i>Liriodendron.</i>	Whin, petty	- <i>Ononis.</i>
Tulip tree, laurel-leaved	- <i>Magnolia.</i>	White-bean tree	- <i>Cratægus.</i>
Tupelo tree	- <i>Nyssa.</i>	White-leaf tree	- <i>Cratægus.</i>
Turk's cap	- <i>Lilium.</i>	Whortleberry	- <i>Vaccinium.</i>
Turk's head	- <i>Cactus.</i>	Wicken tree	- <i>Sorbus.</i>
Turk's turban	- <i>Ranunculus.</i>	Widow wail	- <i>Cneorum.</i>
Turnep	- <i>Brassica.</i>	Willow tree	- <i>Salix.</i>
Turnep, French	- <i>Brassica.</i>	Willow, French	- <i>Epilobium.</i>
Turnep cabbage	- <i>Brassica.</i>	Willow herb	- <i>Lythrum.</i>
Turnep radish	- <i>Raphanus.</i>	Willow herb	- <i>Lyfimachia.</i>
Turnsol	- <i>Heliotropium.</i>	Willow, spiked	- <i>Spiræa.</i>
Turpentine tree	- <i>Pistacia.</i>	Wind flower	- <i>Anemone.</i>

Wind

I N D E X.

<i>English Names.</i>	<i>Botanic Names.</i>	<i>English Names.</i>	<i>Botanic Names.</i>
Wind seed	- <i>Arctotis.</i>	X.	
Winter berry	- <i>Prinos.</i>	Xiphium (bulbous iris)	- <i>Iris.</i>
Winter bloom	- <i>Azalea.</i>	Xylosteum (fly honey-	} <i>Lonicera.</i>
Winter cherry	- <i>Physalis.</i>	suckle)	
Winter cherry	- <i>Solanum.</i>	Y.	
Winter's bark	- <i>Wintera.</i>	Yapon	- <i>Ilex.</i>
Winter savory	- <i>Satureia.</i>	Yarrow	- <i>Achillea.</i>
Witch hazel	- <i>Hamamelis.</i>	Yellow-herb	- <i>Reseda.</i>
Woad	- <i>Isatis.</i>	Yerva-mora	- <i>Rosa.</i>
Wolf's bane	- <i>Aconitum.</i>	Yew tree	- <i>Taxus.</i>
Wolf's peach	- <i>Solanum.</i>	Z.	
Wood-bind	- <i>Lonicera.</i>	Zealand tea, New	- <i>Philadelphus.</i>
Wood of life	- <i>Guaiacum.</i>	Zerumbet (wild ginger)	- <i>Amomum.</i>
Wood anemone	- <i>Anemone.</i>	Zinziber (common ginger)	- <i>Amomum.</i>
Wood sorrel	- <i>Oxalis.</i>	Ziziphus (Jujube tree)	- <i>Rhamnus.</i>
Wormwood	- <i>Artemisia.</i>		
Wound-wort	- <i>Achillea.</i>		

In this Index of the English and other most generally known names of the plants, trees, &c. described in the general process of this work, both of the genera, and the principal or most noted species, with the botanic names of the respective genera; it may be observed, that as many of the genera are not known by any English name, or any other besides that of the botanic, they, together with the other names of the genera only, no species, are wholly arranged in the first Index under their said generical Latin or botanic names, with that of the English, where any occur; and that in regard to the species belonging to the different genera, this Index contains principally the English and most generally received names of all the most remarkable or material plants, &c. thereof; and as most of the genera comprise also several, and some many other less noted species, which could not possibly be all arranged under this head in the Index order, without swelling it considerably beyond the proper necessary limits; the whole belonging to each genus of the eligible garden plants, both of the most noted and other species, are inserted under their said respective genera by their general English and other proper names.

Likewise select lists of the different species belonging to most of the various genera may be seen collectively under several different heads in the body of the work, distributed into tribes, as it were, according to their respective modes or natures of growth, general habit, temperature, particular uses in the different garden districts, and oeconomic qualities, &c. arranging under the following articles—Annual, Biennial, and Perennial Plants, Bulbous, Tuberous, and Fibrous-rooted Plants, &c. Aromatic Plants, Kitchen-garden Plants, Green-house and Stove Plants, Herbaceous Plants, Succulent Plants, Deciduous Trees, Evergreen Trees, Fruit Trees and Forest Trees, and some other similar arrangements occurring in alphabetical order in different parts of the book.

I N D E X

OF THE ESSENTIAL ARTICLES OF GENERAL GARDENING, AND PRINCIPLES OF BOTANY.

IN TWO DIVISIONS.

FIRST DIVISION.

Containing a List of the principal Essentials of General Gardening, comprehended in this Work; comprising the different Garden Districts and Compartments, Plantations, Shrubberies, Green-houses, Hot-houses, Forcing-houses, Hot-walls, Hot-beds and Stoves, with the respective Plants and Trees, &c. separately, of each Department; the principal necessary Garden Materials, different Requisites, proper Earths, Dungs, Manures, and Composts; with the different Methods of Propagation, Planting, Sowing, &c. principal Garden Implements, and general Methods of performing the different Practical Operations, in the various necessary Works in the several Departments; all of which, according as they alphabetically occur in the different Parts of the Book, are fully described and explained.

A.

A LLEYS, forming divisions to beds, borders, and other compartments.

Annual Plants, a numerous tribe, both of flowers and esculent vegetables: arrangement of the different sorts.

Arbours, their uses, and different sorts.

Aromatic Plants, their uses, and different species.

Aquatic Plants and Trees, such as grow near or in water.

Ashes, for manure and other occasions.

Autumn Plants.

Autumn Season.

Avenues of trees, their disposition, and proper trees in their formation.

B.

Bark, or Tan, for bark-beds.

Bark-beds, their different uses and formation.

Bark-pits, in which to make bark-beds.

Baskets, different useful sorts for gardens.

Basons, or Reservoirs of water:

Bafs, for ligaments in tying up plants, &c.

Bafs Mats.—See Mats.

Beds, proper sorts in the different garden departments.

Beds, Hot.—See Hot-beds.

Biennial, or two years' plants.

Blights on trees and plants.

Borders, the different sorts and uses described.

Bosquets of shrubs and flowers, &c.

Bowling-green.

Brooms, proper sorts for gardens.

Budding, for the propagation of trees.—See Inoculation.

Bulbous-rooted flowers, &c.—See *Bulbus*.

C.

Capful, a seed vessel.—See *Capsula*.

Cascades.—See Water.

Caterpillar Insects, on trees and plants.

Clay.—See Earth, Basons, Water, &c.

Climbing Plants, various sorts; both shrubby and herbaceous.—See also *Caulis*, *Cirrhus*, and *Volubilis Caulis*.

Compound Flowers.—See *Compositus Flos*.

Composts of Earths, Dungs, &c. of various compositions, for different occasions.

Cone, a seed-vessel.—See *Conus*, &c.

Creeping Plants.—See *Caulis*, Climbing Plants, and *Hedera*.

Culinary Plants, and Fruit.

Cuttings, to plant for propagation in raising many sorts of trees, shrubs and plants.

D.

Deciduous Trees and Shrubs; their description and different sorts.

Dibble, or Setting-stick, different sorts described.

Digging ground, different methods; as plain digging, trench digging, and digging in ridges.

Drawing;

I N D E X.

Drawing Frame, for annual-flowers, to draw them up tall in stature.
 Drill-sowing, &c.
 Dung for hot-beds.
 Dungs for manure.
 Dwarf fruit-trees, their different orders of training.

E.

Earth, different sorts, proper for gardens, &c.
 Edgings, their utility, different sorts, planting, and culture.
 Edging-Iron.
 Edging-Shears.
 Esculent Plants, such as are eatable.
 Espalier Trees, their general description, utility, and order of training.
 Evergreens, their nature of growth, different sorts, uses, &c.

F.

Flower-garden.—See Pleasure-ground.
 Forcing-frame, for early plants, flowers and fruit.
 ——— by Dung heat.
 ——— by Bark-bed heat.
 ——— by Fire heat.
 ——— Plants and trees for forcing.
 Forcing-house.—See Forcing-frame.
 Forest Trees, their utility and different sorts.
 Fosse, or Haha.
 Frames, Garden Frames, the different sorts described.
 Framing, raising early plants, &c. in hot-beds, under frames.
 Fruit-trees, the different sorts, their different orders of training. See Standard-trees, Dwarf-trees, Trained-trees, Wall-trees, and Espaliers; also, Grafting and Inoculation.
 ——— Their general methods of pruning and training.—See each sort under its respective Genus; also the article Pruning; likewise Wall-trees, Espaliers, Standards, Dwarf-trees, Trained-trees, Orchards, &c.
 ——— Defending the blossom of early blooming Wall-trees.—See Peaches, Nectarines, Apricots, under the articles *Amygdalus* and *Prunus*.

G.

Gardens, referring to the different departments.
 Genus of Plants, comprising one or two to many species.
 Glass-case.
 Glass-lights.—See Lights, and Hand Glasses.
 Grafting, different methods.
 Grass Lawns, Walks, &c.
 Gravel, proper sorts for walks.
 Gravel Walks.
 Green-house, its general description.
 Green-house Plants, the different sorts and general culture.
 Groves of Trees.

H.

Hand Glasses.
 ——— Square-formed.

Hand Glasses, bell-formed.
 Hedges, different sorts, proper trees, consisting of—Deciduous Hedges—Evergreen Hedges.
 Herbs.—See *Herba*.
 Herbaceous Plants.
 Hoes, different sorts, and respective uses.
 Hoeing.
 Horse-dung, for hot-beds, and manure.
 Hot-beds.
 ——— Horse-dung Hot-beds.
 ——— Tanner's-bark Hot-beds.
 Hot-house.—See also Stove.
 Hot-house or Stove plants.—See Stove.
 Hot-walls, for forcing early fruit.

I.

Ice-house.
 Inarching.—See Grafting.
 Inoculation, or Budding, means of propagating numerous sorts of trees.

K.

Kitchen-garden, its general description.
 Kitchen-garden Plants, arrangement of the different sorts.

L.

Labyrinth or Maze.
 Lawns, their proper situations, dimensions and form.
 Laying, the propagation by Layers, in raising many sorts of trees and shrubs, and some kinds of herbaceous plants.
 Light, its beneficial agency in vegetation.
 Lights, Glass-lights of garden frames, &c.
 Lining hot-beds, to renew the heat.
 Loam.—See Earth.
 Luxuriant Plants, Trees, and Flowers, &c.—See *Luxurians*.

M.

Manure, different sorts.
 Marle, for Manure.
 Mats, Bafs Mats, for covering and shading plants, seed-beds, &c.
 Medicinal Plants, the different sorts.
 Melonary, general utility, and description.
 Motion of Plants.—See *Motus*.
 Mould or Mold.—See Earth.
 Mowing.—See Grass.
 Mulch, half-rotted strawy dung; useful in protecting the roots of new-planted and tender young trees from frost and drought.

N.

Nursery, its great utility; general description and management.

O.

Off-sets, means of propagating numerous sorts of plants.
 Oiled-paper frames.—See Paper-frames.
 Orchard, of standard fruit-trees, its general utility, description, proper sorts of trees, planting, and culture.

Others,

Offers, proper plants for supplies of twigs, rods, &c.—See also *Salix*.

P.

Paper Frames.

Parasitic Plants, such as grow upon others.

Parterre, a flower compartment, divided into various small partitions of beds, borders, alleys, &c.

Parting-roots, a method of abundant propagation in numerous herbaceous and under-shrubby plants.

Perennial Plants, or plants of many years' duration; consisting of fibrous-rooted, bulbous and tuberous-rooted kinds.

—— Bulbous-rooted. See *Bulbus*.

—— Fibrous-rooted.—See *Radix perennis fibrosa*.

—— Tuberous-rooted.—See *Tuberous-rooted Plants*.

Piping, a method of propagation applicable principally in pinks and carnations.—See *Dianthus*.

Plantations, in groves, clumps, thickets and shrubberies, &c. in different orders; and of forest trees for timber, and coppices of under-wood.

Planting, the various methods explained.

Plashing, or laying hedges.

Pleasure-ground, its general description, proper plantations, shrubberies, and general management.

Pot-herbs, the different sorts; propagation, and general culture.

Pots, the proper sorts and different sizes for various garden plants, and for green-house and stove exotics.

Propagation of trees and plants, by various methods.—See Sowing Seed, Planting Suckers, Cuttings, Slips, Layers, Off-sets, and Pippings; also Parting-roots, Spawn, Grafting, Budding, and Inarching.

Pruning, the general method, in different sorts of fruit-trees, and others.

Q.

Quick-set-hedges.—See *Crataevus*.

Quincunx Planting.

R.

Racer, or Sward-cutter, used in cutting turf.

Rakes, the different sorts for gardens.

Raking ground, in preparation for sowing and planting; also for raking in seeds in broadcast sowing.

Reed Hedges, their use in gardens, and method of formation.

Ridging ground, in digging and trenching.

S.

Sallad-herbs, the different sorts for general and occasional use.—See also Small sallad-herbs.

Sand. See Earth.

Sand Walks.—See Walks.

Seeds of Plants, general description.—See *Semen*.

Sexes of Plants.—See *Sexus*, also *Classis*, and *Genus*.

Shading plants, seed-beds, &c.

Shifting plants in pots, into larger.

Shrubs, their nature of growth described.—See *Frutex*.

Shrubs and Trees, many different sorts.—See Deciduous and Evergreen Trees and Shrubs.

Shrubberies.—See Pleasure-ground and Plantations.

Slips, means of propagation for raising many sorts of plants.

Small-sallad Herbs, the different sorts, and general culture.

Soup-herbs, the general, and principal sorts.

Sowing seeds, the different methods explained.

Spades, different sorts, for general, and particular uses, in spade work.

Spawn, a progeny of the mushroom tribe, and some other plants.

Species of plants, individuals of a genus.

Sprouts, an off-spring from the stems of plants.

Stage for carnations and auriculas.—See *Dianthus* and *Primula*.

Standard Trees, different orders of training.

Stocks, for grafting and budding, describing the different sorts proper for those occasions.

Stools, for the propagation, by layers.

Stove, or hot-house, the different sorts, and general uses.

Stove Plants, the different genera and species, and general management.

—— Plants, trees, and flowers, for forcing in stoves.

Succeſſion-house, and pits, appertaining to the stove.—See Stove.

Succulent Plants, list of the principal sorts.

Suckers, a progeny from the roots of trees and shrubs, &c. for the propagation of many sorts.

Sun, its great beneficial influence in the growth of plants, &c.

T.

Tan, or Tanner's bark, for bark-beds.

Terrace-walks, their description, and uses in pleasure-ground.

Thermometer, for regulating the degree of heat in stoves.

Thicket plantations of trees and shrubs.

Trained trees, for walls and espaliers

Tree, its difference in growth from a shrub.—See *Arbor* and *Frutex*.

Trees and shrubs, the different hardy sorts.—See Deciduous and Evergreen Trees, Forest and Fruit Trees.

Trellage or Treillis for espalier trees, and other occasions in gardening.

Trenching.—See Digging and Ridging Ground.

Tribes of Plants.—See *Tribus*.

Trowels, for various uses in gardens.

Tuberous-rooted Plants, consisting both of flowers and esculent kinds.

Tubs, for large green-house plants.
 Turf, Grass Turf, for laying lawns, walks, plats, and other grass compartments in gardens.
 Turning Iron, for cutting turf.
 Turning gravel walks.—See Gravel, &c.

U.

Umbelliferous Plants, producing flowers in umbels.—See *Umbella*.

V.

Varieties of the species of plants, flowers, and fruits.—See *Varieties*.

Verticillate Plants, producing flowers in whorls.
 —See *Verticillus*.

W.

Walks, their utility, proper sorts, and order of arrangement in the different garden districts.
 Walls of gardens, both as fences and for wall trees, proper sorts and disposition.
 Wall Trees, their peculiar merit, the different sorts, planting, and general method of training, &c.
 Water, its utility in gardens, for use and ornament, proper disposition, and means of acquirement.

SECOND DIVISION

Comprising a general List of the Botanic Terms and Descriptions contained in this Work, as generally used by the Botanists in describing the different Parts of Plants, and the Principles of the Botanic System; comprehending Descriptions of the Root, Stem, Branches, Leaves, Flowers, Fruit, Seed Vessels, Seeds, &c. and of the Classes, Orders, and Characters of the Genera, Species, and Varieties; with the different Modes of Inflorescence, or Manner of Flowering, and the different Sexes of Plants and Flowers, in Male, Female, and Hermaphrodite; all of which under the said different Heads, as below, are fully explained accordingly as they alphabetically occur in the different Parts of the Book: which, in the whole, after properly consulting the Articles, Characters, Classes, Orders, Genera, and Species, will be sufficient to convey the general essential Principles of the System of Botany.

A.

AGGREGATUS Flos, an aggregate flower composed of many small florets.
 Amentaceus Flos, many small flowers produced in an amentum.
 Amentum, a catkin or slender string of small chaffy flowers.
 Androgyna Planta, a plant producing male and female flowers.
 Annuae Plantae, annual plants, or but of one year's duration.
 Anthera, top of the filament or stamen of flowers, and the male part.
 Apetalus Flos, a flower without petals.
 Aquaticae Plantae, water plants.
 Arbor, a tree, different in growth from a shrub.
 Arista, Acrus or beard of grass and corn flowers.
 Arma, armature of plants.
 Aromaticae Plantae, aromatic or odoriferous plants.
 Axilla, armpit of plants.

B.

Bacca, a Berry.
 Bacciterae Plantae, berry-bearing plant.
 Barba, beard of leaves and flowers.
 Barbatus Flos, a bearded flower.
 Biennis Planta, a biennial or two years' plant.
 Bractea, a floral leaf.
 Bulbus, a bulb or bulbous root.
 Bulbus Caulinus, a bulb produced on the stem, &c.

C.

Calyx, the flower-cup, different sorts.
 Campaniformes Plantae, plants with bell-shaped flowers.
 Capitulum, a little head of flowers.
 Capsula, capsule or hollow seed-vessel, various sorts.
 Catkin, an amentaceous flower.—See *Amentum*.
 Caulis, a stalk or stem of a plant or tree, different sorts described.
 Caulescens, having a stalk or stem.
 Characters, description of the genera of plants.
 Cirrhus, a clasper or tendril of cirrhous-climbing plants.
 Classis, a class or collection of different kindred genera of plants, and thus similarly the whole vegetable kingdom is divided into twenty-four classes, all arranged by name under this said head *Classis*.
 Compositus Flos, compound flower.
 Coniferae, cone-bearing trees and plants.
 Conus, a cone, a species of seed-vessel.
 Corolla, composed of the petals, or flower-leaves.
 Corymbus, an order of cluster-flowering.
 Cotyledones, side lobes of a seed.
 Cruciformis Flos, a cross-shaped flower.
 Cyma, a mode of umbel-flowering.

F.

Femineus Flos, a female flower.
 Femina Planta, a female plant, bearing female flowers only.

Fibrous

Fibrosa Radix, a fibrous root.—See *Radix Perennis Fibrosa*.

Filamentum, thread like part of the stamina of flowers.

Flos, the flower of plants and trees, consisting of the different parts of the fructification.

Flosculus, a little flower or floret.

Foliola, lesser leaves of a compound leaf.

Folium, a leaf of a plant or tree, consisting of numerous different sorts.

Frut, a shrub: difference from a tree explained.

G.

Genus, a fraternity or assemblage of different species of plants.

Germen, seed-bud, or base of the pistillum, of flowers.

Germinatio, germination or sprouting of seeds.

Gluma, a husk, or the calyx of grasses.

H.

Herba, an herb, a plant not becoming woody.

Herbacea Planta, an herbaceous plant, being of an herb-like nature.

Hermaphroditus Flos, hermaphrodite flower, having both male and female parts.

I.

Inflorescentia, inflorescence, or manner of flowering of all sorts, of plants, &c.

Involucrum, a calyx of umbelliferous-flowering plants.

L.

Labiatus Flos, a lipped flower.

Lactescentes plantæ, lactescent or milky plants.

Legumen, a seed pod of the pea, bean, and other pulse.

Liliaceæ, like a lily, liliaceous plants, producing lily-shaped flowers.

Loculamenta, and **Loculi**, cells or seed departments of a capsule.

Luxurians Flos, a luxuriant flower.—See *Luxuriant Plants*.

M.

Mas Planta, a male plant, producing male flowers only.

Masculus Flos, a male flower.

Monopetalous Flos, a flower of one petal.

Monophyllus, of one leaf.

Motus, motion of plants.

Multicapularis, many-capsuled.

Multifidus Flos, a flower or calyx cut into many parts.

Multiplicatus Flos, a multiplied flower.

Musci, mosses, a tribe of imperfect plants.

N.

Nectarium, a part of the corolla, or sort of appendage to the petals of a flower.

O.

Ordo, an order or first subdivision of a class in the classes of plants.—See also *Classis*.

P.

Panicula, a panicle, or mode of flowering.

Papilionaceus Flos, a butterfly-shaped flower.

Pappus, down of flowers.

Parasitus Planta, a parasitic plant, growing upon other plants or trees.

Pedicellus, a pedicle or little foot-stalk of a flower.

Pedunculus, a peduncle, or main foot-stalk of a flower.

Pendulus Flos, a pendulous or hanging flower.

Perennis Planta, a perennial or many years' plant.—See also *Radix Perennis*.

Perianthium, a flower cup, or most common species of calyx.

Pericarpium, the seed-vessel of plants, different sorts.

Petalum, petal or flower-leaf.

Petiolus, the petiole or foot-stalk of a leaf.

Pistillum, the pistil or style, the female organ in the centre of a flower.

Plenus Flos, a full or double flower.

Pollen, meal, or male prolific powder of the anthera.

Polygamia, many marriages, or intercommunication of different sexes in the flowers of particular plants.

Pomum, apple or fleshy fruit, a species of seed vessel.

R.

Racemus, a raceme or cluster of flowers or berries.

Radiatus Flos, a radiated flower of the compound tribe.

Radius, the ray, radius, or outer spreading circumference of a compound flower, &c.

Radicula, radicle or little root.

Radix, the root of plants and trees, &c. many sorts.

Radix Perennis Fibrosa, perennial fibrous roots, applicable to a numerous tribe of plants.

Ramus, a branch of a tree.—See *Caulis*.

S.

Semen, seed of plants, various sorts.

Sexus, sexes of plants, in producing male, female, and hermaphrodite flowers.

Spadiceus Flos, a flower or aggregate of flowers produced on a spadix.

Spadix, the receptacle of spadiceous or spathaceous flowers produced from a spatha.

Spatha, a sheath or common calyx of spadiceous flowers.

Species, the individuals, or different kindred plants of a genus or family, as arranged under the various genera in the course of this work, their distinctive difference explained.—See *Species* and *Genus*.

Spica, spike of flowers, a mode of flowering.

Spina, a spine or thorn, one of the armature of plants and trees.

Stamina, male organ of flowers, consisting of the filaments or thread like parts in the centre, supporting the antheræ, containing the male powder.

Stellata

I N D E X.

Stellata planta, a starry plant.

Stigma of the flower, summit of the pistillum or female organ.

Stipulæ, small scale-like leaves at the base of the larger.

Strobilus, a seed-vessel of the cone kind.

Stylus, the style in the centre of a flower, placed on the top of the germen, elevating the stigma or female part.

Succulentæ, juicy, or succulent plants.

Suffruticosus, under-shrubby.

T.

Thyrus, thyrses, a mode of cluster-flowering.

Tomentosa Planta, a plant having the leaves tomentose or white-downy.

Tribus, tribes of plants, various.

Truncus, stem or stalk of trees and plants.

Tuberosa Radix, a tuberous-root.

U.

Umbella, an umbel of flowers, a mode of flowering.

Umbelliferous Plants, such as produce flowers in an umbel.

Umbilicatum folium, a navel-shaped leaf, &c.

V.

Valvula, a valve, or opening of a seed-vessel.— See also *Capsula*.

Varietas, a variety, applicable to plants, flowers, and fruit, off-spring of certain species; and some, very numerous.

Verticillus, a Whorl, a mode of flowering, the flowers growing in whorls.

Volubilis Caulis, a twining or winding-climbing stalk, in many sorts of shrubby and herbaceous plants.

F I N I S.

